

# Annual Report

2013 - 2014



Indian Institute of Technology  
Kharagpur

*September 2014*

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## **Members of the Council of Indian Institutes of Technology**

1. Dr. M. Mangapati Pallam Raju, Upto 26-05-2014  
Former Hon'ble Minister of Human Resource Development  
  
Smt. Smriti Zubin Irani, From 27-05-2014 - Present  
Hon'ble Minister of Human Resource Development
2. Smt. Vasanthi Stanley,  
Hon'ble Member of Parliament (RajyaSabha)
3. Shri Janardhana Swamy,  
Hon'ble Member of Parliament (LokSabha)
4. Shri Deepender Singh Hooda  
Hon'ble Member of Parliament (LokSabha)
5. Shri Ashok Thakur, Secretary (HE), MHRD, New Delhi
6. Dr. Vijay P. Bhatkar, Chairman, Board of Governors, IIT Delhi
7. Dr. R.P. Singh, Chairman, Board of Governors, IIT Guwahati
8. Prof. M. Anandkrishnan, Chairman, Board of Governors, IIT Kanpur
9. Prof. M.M. Sharma, Chairman, Board of Governors, IIT Madras
10. Dr. Lalji Singh, Chairman, Board of Governors, IIT (BHU), Varanasi
11. Shri B.V.R. Mohan Reddy, Chairman, Board of Governors, IIT Hyderabad
12. Shri Ajai Chowdhry, Chairman, Board of Governors, IIT Patna
13. Prof. Goverdhan Mehta, Chairman, Board of Governors, IIT Jodhpur
14. Prof. Devang V. Khakhar, Director, IIT Bombay
15. Prof. R.K. Shevgaonkar, Director, IIT Delhi
16. Prof. Gautam Biswas, Director, IIT Guwahati
17. Prof. Indranil Manna, Director, IIT Kanpur
18. Prof. Bhaskar Ramamurthi, Director, IIT Madras
19. Prof. Pradipta Banerji, Director, IIT Roorkee
20. Prof. Rajeev Sangal, Director, IIT (BHU), Varanasi
21. Prof. Sudhir K. Jain, Director, IIT Gandhinagar
22. Prof. Anil K. Bhowmick, Director, IIT Patna

23. Prof. U.B. Desai, Director, IITHyderabad
24. Prof. M.K. Surappa, Director, IIT Ropar
25. Prof. Madhusudan Chakraborty, Director, IIT Bhubaneswar
26. Prof. C.V.R. Murty , Director, IIT Jodhpur
27. Prof. Timothy Gonsalves, Director, IIT Mandi
28. Prof. Pradeep Mathur, Director, IIT Indore
29. Prof. Partha P. Chakrabarti, Director, IIT Kharagpur
30. Prof. Ashok Misra, Former Director, IIT Bombay & India Intellectual Ventures, Bangalore
31. Prof. Ashok Jhunjhunwala, Deptt. of Elect. Engg., IIT Madras
32. Prof. R.C. Budhani, Director, Director's Secretariat, NPL, New Delhi
33. Prof. S.K. Joshi, Former Director General, CSIR
34. Dr. V.K. Saraswat, DRDO (Former SA to Raksha Mantri) – Special Invitee
35. Admiral D.S.P. Verma – Special Invitee
36. Shri K.D. Nayak, CC&DS, DRDO (on behalf of Dr. Avinash Chandra)
37. Smt. Amita Sharma, Additional Secretary (TE), MHRD, New Delhi and Secretary of the IIT Council.
38. Shri Yogendra Tripathi , JS&FA, MHRD
39. Shri Alok Mishra, Director (IITs), MHRD, New Delhi
40. Shri R.N. Mishra ADG – PIB
41. Shri S. Gopal Krishna, Under Secretary, MHRD
42. Ms. Prisca Mathew, Under Secretary, MHRD
43. Shri R.A.S. Kushwaha, Project Officer, Secretariat of Council of IITs
44. Shri V.K. Wadhwa, Project Officer, Secretariat of Council of IITs
45. Shri. Kamal R. Saha, Project Officer, Secretariat of Council of IITs

### **Outgoing Members**

1. Prof. T. Ramasami, Chairman, Board of Governors, IIT Ropar
2. Prof. Dhananjai Pandey, Former Officiating Director, IIT (BHU), Varanasi

3. Prof. S.K. Som, Former Officiating Director, IIT Kharagpur
4. Prof. Gautam Barua, Former Director, IIT Guhawati
5. Prof. Prem Kumar Kalra, Former Director, IIT Jodhpur

**New Members**

1. Prof. V.S. Ramamurthi, Chairman, BOG, IIT Ropar
2. Prof. Rajeev Sangal, Director, IIT (BHU), Varanasi
3. Prof. Partha P. Chakrabarti, Director, IIT Kharagpur
4. Prof. Gautam Biswas, Director, IIT Guhawati
5. Prof. C.V.R. Murty, Director, IIT Jodhpur

**Board of Governors, IIT Kharagpur**  
**From 1<sup>st</sup> April, 2013 to 31<sup>st</sup> March, 2014**

<b>Sl. No</b>	<b>Name &amp; Address</b>	<b>Position</b>
1.	Dr. Shiv Nadar (Upto 20.03.2014) Chairman,BoG, IIT Kharagpur & Founder- HCL Technologies Ltd. A-10/11, Sector-3 Noida-201301, U.P.	Chairman
2.	Dr. Srikumar Banerjee (From 21.03.2014) DAE Homi Bhabha Chair Professor Room No. A 419, 4 <sup>th</sup> Floor Central Complex Bhabha Atomic Research Centre, Trombay Mumbai - 400085	Chairman
3.	Dr. Srikumar Banerjee (Upto 20.03.2014) DAE Homi Bhabha Chair Professor Room No. A 419, 4 <sup>th</sup> Floor Central Complex Bhabha Atomic Research Centre, Trombay Mumbai - 400085	Member
4.	Prof. B. B. Bhattacharya Professor of Economics A-44, Sarve Sanjhi Apts. Plot No.8, Sector-9, Dwarka New Delhi-110077	Member
5.	Shri Sandipan Chakravorty Managing Director Tata Steel Processing & Distribution Limited (TSPDL) Tata Centre (Ground Floor), 43, Chowringhee Road Kolkata – 700071	Member
6.	Prof. N. Balakrishnan Supercomputer Education and Research Centre Indian Institute of Science Bangalore - 560012	Member
7.	Shri Tamal Dasgupta (Upto 16.12.2013) A-3, Royal Greens 49/1, PGM Shah Road Golf Garden Kolkata - 700033	Member
8.	Shri Sanjiv Goenka (From 17.12.2013) Chairman, RP-Sanjiv Goenka Group CESC House 1, Chowringhee Square Kolkata - 700001	Member

9.	Prof. S. K. Som (Upto 27.07.2013 FN) Director (Officiating) IIT Kharagpur	Member
10.	Prof. Partha P. Chakrabarti (From 27.07.2013 AN) Director IIT Kharagpur	Member
11.	Prof. N. R. Mandal (Upto 31.12.2013) Dept. of Ocean Engg. & Naval Architecture IIT Kharagpur	Member
12.	Prof. Rajendra Singh (From 01.01.2014) Dept. of Agricultural & Food Engineering IIT Kharagpur	Member
13.	Prof. S. K. Satsangi (From 31.12.2013) Dept. of Ocean Engg. & Naval Architecture IIT Kharagpur	Member
14.	Prof. Swagata Das Gupta (From 01.01.2014) Dept. of Chemistry IIT Kharagpur	Member
15.	Dr. T.K. Ghosal Registrar IIT Kharagpur	Secretary



**Finance Committee, IIT Kharagpur**  
**From 1<sup>st</sup> April, 2013 to 31<sup>st</sup> March, 2014**

<b>Sl. No</b>	<b>Name &amp; Address</b>	<b>Position</b>
1.	Dr. Shiv Nadar (Upto 20.03.2014) Chairman,BoG, IIT Kharagpur & Founder- HCL Technologies Ltd. A-10/11, Sector-3, Noida-201301, U.P.	Chairman
2.	Dr. Srikumar Banerjee (From 21.03.2014) DAE Homi Bhabha Chair Professor Room No. A 419, 4 <sup>th</sup> Floor, Central Complex, Bhabha Atomic Research Centre, Trombay Mumbai – 400085	Chairman
3.	Joint Secretary & Financial Adviser Government of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan, New Delhi -110115	Member
4.	Director (IITs) Government of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan,New Delhi -110115	Member
5.	Shri Tamal Dasgupta (Upto 16.12.2013) A-3, Royal Greens 49/1, PGM Shah Road, Golf Garden Kolkata – 700033	Member
6.	Shri Sandipan Chakravorty (From 28.04.2014) Managing Director, Tata Steel Processing & Distribution Limited (TSPDL), Tata Centre (Ground Floor), 43, Chowringhee Road, Kolkata – 700071	Member
7.	Prof. S. K. Som (Upto 27.07.2013 FN) Director (Officiating) IIT Kharagpur	Member
8.	Prof. Partha P. Chakrabarti (From 27.07.2013 AN) Director IIT Kharagpur	Member
9.	Prof. S. K. Satsangi ( Upto 31.12.2013) Dept. of Ocean Engg. & Naval Architecture IIT Kharagpur	Member
10.	Prof. Rajendra Singh (From 28.04.2014) Dept. of Agricultural & Food Engineering IIT Kharagpur	Member
11.	Dr. T.K. Ghosal Registrar IIT Kharagpur	Secretary

## **Building and Works Committee**

**From 1<sup>st</sup> April, 2013 to 31<sup>st</sup> March, 2014**

1	Prof. S. K. Som (Upto 27.07.2013 FN) Director (Officiating) IIT Kharagpur	Chairman
2	Prof. Partha P. Chakrabarti (From 27.07.2013 AN) Director IIT Kharagpur	Chairman
3	Superintending Engineer & Circle Manager Midnapore Distribution Circle West Bengal State Electricity Distribution Co. Ltd. (WBSEDCL) 190, S. K. Bose Road Paschim Medinipur PIN - 721101	Member
4	Superintending Engineer South Western Circle Public Works Department (PWD) Saheed Mangal Pandey Sarani Paschim Medinipur PIN - 721101	Member
5	Head Department of Civil Engineering IIT Kharagpur	Member
6	Head Department of Electrical Engineering IIT Kharagpur	Member
7	Head Dept. of Architecture & Regional Planning IIT Kharagpur	Member
8	Registrar IIT Kharagpur	Secretary

## Administrative Heads

<b>Position</b>	<b>Name</b>	<b>From</b>	<b>To</b>
<b>Director</b>	Prof. S.K. Som		Upto 26.07.2013
	Prof. Partha P. Chakrabarti	27.7.2013(AN)	27.7.2018(FN)
<b>Deputy Director</b>	Prof. Souvik Bhattacharyya	04.11.2013	03.11.2016
<b>Dean (Faculty)</b>	Prof. Amit Basak		Upto 30.09.2013
	Prof. Pratim Kumar Chattaraj	01.10.2013	30.09.2016
<b>Dean (UGS)</b>	Prof. Somnath Sengupta		Upto 30.06.2013
	Prof. A. N. Samanta	01.07.2013	15.08.2013
	Prof. Rajendra Singh	16.08.2013	15.08.2016
<b>Dean (PGS&amp;R)</b>	Prof. Amar Nath Samanta	01.05.2012	30.04.2015
<b>Dean (SA)</b>	Prof. Nisit Ranjan Mandal	01-04-2012	30.03.2015
	Prof. P.P. Chakrabarti		Upto 30.06.2013
<b>Dean (SRIC)</b>	Prof. Sunando Dasgupta	01.08.2013	31.07.2016
<b>Dean (CE)</b>	Prof. Somnath Sengupta		Upto 30.09.2013
	Prof. Om Prakash Sha	01.10.2013	30.09.2016
<b>Dean (AA&amp;IR)</b>	Prof. Amit Patra		Upto 30.09.2013
	Prof. Siddhartha Mukhopadhyay	01.10.2013	30.09.2016
<b>Dean (P&amp;C)</b>	Prof. B.K. Mathur		Upto 30.09.2013
	Prof. Biswajit Mahanty	01.10.2013	30.09.2016
<b>Acting Dean, VGSOM</b>	Prof. K.K. Guin	05.06.2012	U.F.O
<b>Dean, RGSOIPL</b>	Prof. Khushal Vibhute	04.03.2013	03.03.2015
<b>Associate Dean, SRIC</b>	Prof. Pallab Dasgupta	07.10.2013	06.10.2016

**Heads of the Dept./ Centre/School/Unit**

Aerospace Engineering	Prof. B. N. Singh	11.09.2013	10.09.2016
Agricultural & Food Engineering	Prof. P.B. S. Bhadoria	01.09.2011	31.08.2014
Architecture & Regional Planning	Prof. Subrata Chattopadhyay	01.08.2014	31.07.2017
Chemical Engineering	Prof. Narayan Chandra Pradhan	01.01.2012	31.12.2015
Chemistry	Prof. Tanmaya Pathak	01.06.2014	31.05.2017
Civil Engineering	Prof. Subhasish Dey	01.01.2013	31-12-2015
Computer Science & Engineering	Prof. Rajib Mall	01.04.2013	31.03.2016
Cryogenic Engineering	Prof. Kanchan Chowdhury	01.01.2013	31-12-2015
Electrical Engineering	Prof. Siddhartha Sen	01.05.2013	30.04.2016
Electronics & Electrical Communication Engg	Prof. Swapna Banerjee	16.06.2012	31.12.2014
Geology & Geophysics	Prof. Debashish Sengupta	01.01.2013	31.12.2015
Humanities & Social Sciences	Prof. Vijai Nath Giri	01.10.2013	30.09.2016
Industrial & Systems Engineering	Prof. Manoj Kumar Tiwari	01.01.2013	31.12.2015
Mathematics	Prof. Umesh Chandra Gupta	01.10.2013	30.09.2016
Material Science Centre	Prof. Susanta Banerjee	08.05.2014	07.05.2017
Mechanical Engineering	Prasanta Kumar Das	01.10.2013	30.09.2016
Metallurgical & Materials Engineering	Prof. Gour Gopal Roy	01.04.2014	31.03.2017
Mining Engineering	Prof. K.U.M. Rao	17.10.2013	31.10.2014
Ocean Engineering & Naval Architecture	Prof. Trilochan Sahoo	01.10.2013	30.09.2016
Physics	Prof. Arghya Taraphder	01.02.2014	31.01.2017
Rubber Technology Centre	Prof. Dipak Khastgir	01.10.2013	30.09.2016

Biotechnology	Prof. Tapas Kumar Maiti	01.01.2013	31.12.2015
School of Information Technology	Prof. Rajib Mall	01.04.2013	31.03.2016
School of Medical Science & Technology	Prof. Pranab Kumar Dutta	07.03.2012	06.03.2015
Reliability Engineering Centre	Prof. V. N. Achutha Naikan,	01.12.2013	30.11.2016
Centre for Oceans, Rivers, Atmosphere & Land Sciences (CORAL)	Prof. Arun Chakraborty	29.06.2013	28.06.2016
GS Sanyal School of Telecom	Prof. Saswat Chakrabarti	01.04.2012	31.03.2015
Rural Development	Prof. P. B. S. Bhadoria	01.10.2013	Extn. upto 31.08.2014
Ranbir & Chitra Gupta School of Infrastructure Design & Management	Prof. U.K. Banerjee	01.09.2011	31-08-2014
School of Water Resources	Prof. Dhrubajyoti Sen	01.04.2013	31.03.2016
Computer & Informatics Centre	Prof. Prabir Kumar Biswas	10.03.2011	09.03.2014 10.03.2014 31.03.2015
Centre for Educational Technology	Dr. Bani Bhattacharya	06.07.2012	31-12-2013 01.01.2014 31.12.2014
Institute Information Cell	Prof. B. K. Mathur	06.09.2002	U.F.O
	Prof. Soumya Kanti Ghosh	01.12.201	U.F.O
Admin Computer Service Support Centre (ACSSC)	Prof. Debasis Bhattacharya	01.12.2013	30.11.2016
Advanced Technology Development Centre	Prof. Sunando Dasgupta	02.08.2013	01.08.2016
Rajendra Mishra School of Engineering Entrepreneurship	Prof. Partha Pratim Das	01.10.2013	30.09.2016
School of Bioscience	Prof. Amit Basak	18.02.2014	17.02.2017
School of Nano-Science	Prof. Samit Kumar Ray	18.02.2014	17.02.2017

and Technology

School of Energy Science & Engineering      Prof. A K Sinha      19.02.2014      18.02.2017

School of Environment Science and Engineering      Prof. Jayanta Bhattacharya      03.03.2014      02.03.2017

**Chairman of the Various Centres / Committees**

Chairman (Civil Construction & Maintenance)	Prof. Baidurya Bhattacharya	01.10.2013	30.09.2016
Hall Management Centre (HMC)	Prof. Pallab Banerji	04.08.2014	03.08.2017
Chairman, Career Development Centre (Previously - Training & Placement Section)	Prof. S. K. Barai	01.01.2014	31-03-2015
Central Library	Prof. Subrata Chattopadhyay	26.06.2012	25.06.2015
GATE	Prof. B. C. Meikap	12.05.2014	GATE-2015
JEE	Prof. M.K. Panigrahi	01.09.2013	JEE-2014
JAM	Prof. B. C. Meikap	12.05.2014	JAM-2015
Enterprise Resource Planning (ERP)	Prof. Debasis Bhattacharya	01.12.2013	30.11.2016
I. Central Research Facility (CRF). Chairman, Materials Division	Prof. Rahul Mitra	01.12.2013	30.11.2016 (Extension)
II. Central Research Facility (CRF), Chairman, Life Science Division,	Prof. Amit Kumar Das	01.12.2013	30.11.2016
Central Workshop & Instruments Service (CWISS)	Prof. Asimava Roy Choudhury	10.08.2012	09-08-2015
Rajbhasha Vibhag	Prof. D.K.Gupta	01.10.2013	30.09.2016
Nehru Museum of Science & Technology	Prof. Dhruvajyoti Sen	01.10.2013	30.09.2015
Kalpana Chawla Space	Prof. Dipanwita Roy Chowdhury	01.01.2013	31.12.2015

Technology Cell (KCSTC)			
Staff Benefit Fund	Registrar	01.07.2002	U. F. O.
Students' Brotherhood Fund (SBF)	Dr. V. R. Desai	03.03.2003	U.F.O
House Allotment Committee (HAC)	Prof. Ashis Bhattacharjee	01.10.2013	30.09.2016
Commercial Establishments & Licencing Committee (CELC)	Prof. P.B.S. Bhadoria	20.05.2010	31.12.2013
		01.01.2014	31.12.2014
Standing Consultative Committee on Community Issues (SCCCI)	Director (Ex-officio)		
Security and Transport Advisory Committee (STAC)	Deputy Director (Ex-officio)		
Space Allocation Committee (SAC)	Director (Ex-officio)		
Campus Schools Advisory (CSA) Committee	Prof. B. Mahanty	20-02-2013	19.02.2015
Industrial Training Centre, Hijli	Dean, Continuing Education	Ex-officio	
Campus Green Cover (CGC)	Prof. Adinpunya Mitra	01.10.2013	30.09.2016
Canteen Management Com.	Prof. A. K. Deb	01.02.2013	31.01.2015
Technology Film Society	Dean, Students' Affairs,	<i>Ex-officio</i>	
House Building Advance	Registrar	01.08.1996	U. F. O.
Scooter & Cycle Allowance	Registrar	26.07.1993	U. F. O.
Computer Purchase, Maintenance & Networking Committee	Prof. P.K.Biswas	01.10.2013 to 31.03.2014	
		01.04.2014 to 31.03.2015	
Furniture *	Deputy Director	<i>Ex-officio</i>	
Budget & Allotment of Fund	Deputy Director ,	<i>Ex-officio</i>	

Vice-chairmen/Others

Vice-Chairman, GATE	Prof. M. Ramgopal Dr. K. S. Rao	12.05.2014	GATE-2015
Vice-Chairman, JEE	Prof. Surjya Kanta Pal	01.09.2013	JEE-2014
Vice-Chairman, JEE	Prof. D. Chakravarty	01.09.2013	JEE-2014
Vice-Chairman, JAM	Prof. M. Ramgopal Dr. K. S. Rao	12.05.2014	JAM-2015
Vice-Chairmen, Career Development Centre	Prof. Debasis Deb Dr. A Rajakumar Dr. Sujoy Kumar Kar	01.01.2014	31.12.2015
Vice-Chairman, Technology Aquatic Society (TAS)	Dr. T. K. Goswami	01.10.2013	30.09.2014
Vice-chairman, Technology Film Society (TFS)	Prof. Arnab Roy	01.10.2013	30.09.2016
Treasurer, TFS	Prof. Saikat Kumar Paul	01.10.2013	30.09.2016
President, Technology Students' Gymkhana (TSG)	Prof. Joy Sen	01.10.2013	30.09.2016
Treasurer, TSG	Dr. Somesh Kumar	01.09.2011	31.08.2014
Head, NSS	Dr. P. K. Bhowmick	01.07.2002	U.F.O
Coordinator, EAA	Dr. S. C. Mahapatra	01.07.2002	U.F.O
Convener, Centre for Theoretical Studies (CTS)	Prof. Sayan Kar	07.10.2013	06.10.2016
Convener, Inst. Lecture Series Comm.	Dean, Continuing Education		<i>Ex – Officio</i>
Coordinator SC/ST	Prof. Partha Saha		2013-2014 and 2014-2015
Coordinator, PGDMOM	Prof. S. C. Misra	01.10.2007	30.09.2010
Coordinator, PGDST	Prof. P K Sen	01.10.2013	30.09.2015
Head, B. C. Roy Technology Hospital	Dr. B. Mishra	04.12.2010	U.F.O
Chief Vigilance Officer	Prof. Balbir Kumar Mathur		



Managing Director, STEP	Prof. Indranil Sengupta	01.10.2013	30.09.2016
Vice-Chairman (Civil Construction & Maintenance)	Prof. Sushanta Chakraborty	01.10.2013	30.09.2016
Vice-Chairman (Civil Construction & Maintenance, Architecture & Planning)	Prof. Shankha Pratim Bhattacharya,	01.10.2013	30.09.2016
Faculty Coordinator, Counseling Services	Dr. S.D. Bhattacharya	19.08.2013	18.08.2016
Coordinator, Vodafone Essar-IIT Centre of Excellence in Telecommunications (VEICET)	Prof. Saswat Chakrabarti,	19.04.2011	U.F.O.
Coordinator, National Knowledge Network (NKN)	Prof. P.K. Biswas	09.03.2010	U.F.O.
Vice Chairman, ERP & Co-PI, IER Project	Dr. Shyamal Kumar Das Mandal	28.05.2014	27.05.2017
Programme Cordinator, International Summer Winter Term (ISWT)	Prof. A Goswami	25.03.2014	24.03.2017

**Professors-in-Charge**

Electrical Works	Prof. A. K. Pradhan	01.10.2013	30.09.2016
Associate Professor-in-Charge (Electrical Works)	Dr. Prabodh Bajpai	01.01.2014	31.12.2017
Refrigeration & AC Unit	Prof. M. Ramgopal	01.08-2011	31-07-2014
		01.08.2014	31.07.2017
Horticulture	Prof. Adinpunya Mirtra	01.10.2013	30.09.2016
Water Works	Prof. M. M. Ghangrekar	01.10.2013	30.09.2016
Institute Guest Houses	Prof. B. K. Sengupta	01.08.2011	UFO
Technology Telecom Centre	Prof. Raja Datta	04.02.2011	03.02.2014
		04.02.2014	03.02.2016

Time Table	Prof. Dilip Kumar Baidya	01.10.2013	30.09.2016
Audio Visual Cell	Chairman	<i>Ex-officio</i>	
Examinations	Prof. Madan Kumar Jha	01.10.2013	30.09.2016
Convocation	Prof A.N. Samanta, Dean(PGS&R)	For 2013	
	Prof A.N. Samanta, Dean(PGS&R)	For 2014	
Advanced VLSI Laboratory	Prof. T.K.Bhattacharyya	01.10.2013	30.09.2015
IPR & IR	Prof. Goutam Saha	07.10.2013	06.10.2016
IIT Kharagpur Kolkata Campus	Prof. A.P.Gupta	01.08.2013	31.07.2015
IIT Kharagpur Bhubaneswar Campus	Prof. G. C. Mitra	01.10.2013	30.09.2014
Advanced Laboratory for Plant Genetic Engineering	Prof. Sudip Kumar Ghosh	01.10.2013	30.09.2016
Incubation & Entrepreneurship Activities of SRIC along with TIETS	Prof. Indranil Sengupta	01.10.2013	30.09.2016
Automobile Section	Registrar	17-9-2010	U.F.O.
B.C.Roy Technology Hospital	Prof.Chhanda Chakraborti	26.06.2012	25.06.2015
Centre for Railway Research (CRR)	Prof. Suvranshu Roy	10.02.2014	09.02.2017
Radiological Safety Officer	Prof. Ananta Kumar Ghosh	24.06.2010	U.F.O.
P. K. Sinha Centre for Bio Energy	Prof. Debabrata Das	01.02.2014	31.01.2017
Co-Professor in-Charge, Centre for Railway Research (CRR)	Prof. Arghya Deb	04.04.2014	03.04.2017
Co-Professor-in-Charge, Refrigeration & AC Unit	Dr. Parthasarathi Ghosh	01.08.2014	31.07.2017
<b><u>Miscellaneous Assignment</u></b>			
Institute's Representative at the Indian Member Council	Prof.Om Prakash Sha, Dept. of OE&NA Dean (CE)	26.05.2014	UFO

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**Deputy Director** - **Prof. Souvik Bhattacharyya**

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Prof. Sudip Kumar Ghosh

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Prof. Sudarsan Neogi  
Prof. Jayanta Kumar Basu  
Prof. Goutam Kundu  
Prof. B.C. Meikap

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Prof. J.K. Roy  
Prof. P.K. Chattaraj  
Prof. T. Pathak  
Prof. T. S. Pal  
Prof. A. Basak  
Prof. D. Ray  
Prof. M. Bhattacharjee  
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Prof. Nilmoni Sarkar  
Prof. Swagata Dasgupta  
Prof. Sarbani Taraphder  
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Prof. Saumen Hajra  
Prof. Joykrishna Dey  
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Prof. C.R. Raj

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Prof. K.S. Reddy  
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Prof. S. Ram  
Prof. Susanta Banerjee  
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Prof. G. Sinha

Prof. Prabina Rajib

**Central Library**

Dr. B. Sutradhar, Librarian

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- 2.Mr. Ishan Garg, UG Representative
- 3.Mr. Avinash Kumar Sharma, PG Representative
- 4.Mr. Shubhankar Chakraborty, RS Representative

**Secretary**

Dr. T. K. Ghosal

## **DIRECTOR'S REPORT**

Over the last sixty years, not only has IIT Kharagpur spearheaded setting up new standards in engineering education but has also put its best limbs forward in all spheres of national development from the strategic sectors of Defense, Space and Atomic energy to the Economic, Public and Development sectors that directly or indirectly touch the lives of all the citizens of India. IIT Kharagpur has been producing students who are global citizens over these years. Today, in addition to its continued academic excellence, the nation looks up to the IITs to address some of its major problems that will lead to a better and a more promising future. These include concerns about all round sustainability including safety and security, food and nutrition, shelter and habitat, energy and environment, economy and employment. Moreover, the IITs are now mandated to be able to spread their educational excellence beyond the boundaries of their own Institutions and reach out to a much larger number of people requiring quality education. During the last year, we at IIT Kharagpur have responded to this challenge by taking up major projects related to Future of Cities, Food and Nutritional Sustainability, Signals and Systems in Life Sciences, Science and Heritage Initiative and other major research projects related to Clean Water, Bio-energy, Environment and the like. In parallel, we continue to pursue technology development in cutting edge areas like Nano-Science, Bio-MEMS, Materials, Circuit Design and Mathematical Methods, which produce research publications in top quality journals keeping us at par with the best in the world.

IIT Kharagpur's major strength lies in its ability to recognize the continued need for achieving greater heights. In order to increase the scope for our international exposure, the Institute has successfully started an International Summer and Winter Programme which has brought several international faculty to this Institute enabling not only exchange of ideas in teaching and research but also fostering collaborations with Institutes of the highest repute. We have also embarked on an outreach programme through which we are able to communicate with ten thousand teachers of college level institutions and help them in the pedagogy of imparting quality education. We have tried to instill competitive and collaborative excellence through promotion of Research Challenge Grants which have excited both our young and senior faculty members simultaneously. Attracting sufficient high quality faculty remains the biggest challenge of the IIT System and IIT Kharagpur is not an exception. We have, therefore, initiated an aggressive recruitment process through which we screen quality applications and provide appointments as soon as possible. Special efforts are made to identify and induct brilliant faculty from industry and academia within the country and from abroad.

### **ACADEMIC PROGRAMMES**

The Institute presently offers BTech (Hons) programme in seventeen different branches of Engineering, BArch (Hons) programme in Architecture, fifteen Dual Degree programmes, seven Integrated MSc programmes, four Joint MSc-PhD programmes, and fifty- one Postgraduate degree programmes leading to Joint MTech / MCP-PhD, MBM, MHRM, LLB and MMST degrees. The curricula and syllabi of these programmes are periodically updated with focus on quality and excellence to meet the demands of the changing world.

The existing ERP System has also been strengthened. All academic issues including faculty recruitment, students' registration, enrollment, course allocation, examination results, students' feedback and sponsored project details are now available on-line through this system.

### **59<sup>TH</sup> CONVOCATION**

Fifth-ninth Annual Convocation of the Institute was held on July 27, 2013. Shri Sandipan Chakravorty, Managing Director of Tata Steel Processing and Distribution Limited / Dr. M. M.

Pallam Raju, Hon'ble Minister of Human Resource Development Government of India, was the Chief Guest. The convocation conferred degrees to 2157 graduates that include 164 Ph.D., 29 MS, 771 M.Tech., 32 MCP, 123 MBA, 04 MMST, 17 MHRM, 27 LLB, 270 Dual Degree, 472 B.Tech. (Hons), 20 B.Arch. (Hons.) and 228 M.Sc. degrees.

- Shri Utsav Banerjee of the Department of Electronics and Electrical Communication Engineering is the recipient of **President of India Gold Medal** for the best academic performance among the outgoing B.Tech. (Hons.) and B.Arch. (Hons.) students.
- Shri Srijan Kumar of the Department of Computer Science and Engineering has won the **Dr. Bidhan Chandra Roy Memorial Gold Medal** for the best all-round performance among the B.Tech. (Hons.) and B.Arch.(Hons.) outgoing students.
- **The Prime Minister of India Gold Medal** for the best academic performance among the Dual degree and Integrated M.Sc. outgoing students goes to Shri Mayank Shrivastava of the Department of Computer Science and Engineering.
- **Dr. Jnan Chandra Ghosh Memorial Gold Medal** for the best all-round performance among the outgoing Dual Degree and Integrated M.Sc. students is awarded to Shri Abhishek Raj of the Department of Chemical Engineering.
- Shri Suvra Kanti Chakraborty of the Department of Mathematics has won the **Professor Jagadish Chandra Bose Memorial Gold Medal** for the best academic performance among the outgoing students of all 2-year M.Sc. courses in the Science Disciplines.
- Shri Santigopal Samanta of the Department of Metallurgical and Materials Engineering is the recipient of **The Director's Gold Medal** for the best academic performance among the students completing M.Tech. and MCP courses.

The Senate and the Board of Governors of the Institute conferred the highest honor, the degree of **Doctor of Science (Honoris Causa)**, on the following distinguished personalities:

- Shri Arun Sarin in recognition of being a doyen of the telecommunications industry making Vodafone the world's largest mobile phone company
- Shri Y. C. Deveshwar for his visionary leadership in making ITC to become a truly global company

In the convocation, the **Distinguished Alumnus Awards** were conferred on:

- Dr. Aditi Chattopadhyay, Ira A. Fulton Chair Professor of Mechanical and Aerospace Engineering and the Director of the Adaptive Intelligent Materials and Systems Research Center at Arizona State University
- Shri Aniruddha Roy, Former Executive Director of Eveready Industries Limited
- Shri Devinder Kumar Gupta, President of the All India Federation of Plastic Industry
  
- Professor Jay Chatterjee, Dean Emeritus and Emeritus Professor of Architecture and Planning at the University of Cincinnati
- Dr. K. G. Narayanan, Technology Adviser of Indian industry
- Shri Kamal Kumar Sarvadhikari, Former CEO of Sensi Vida Medical Technologies, Inc.
- Professor Keshab K. Parhi, Distinguished McKnight University Professor and Edgar F. Johnson Professor in the Department of Electrical and Computer Engineering at the University of Minnesota
- Dr. Parimal Kanti Bharadwaj, Senior Professor and Head of the Department of Chemistry at IIT Kanpur
- Shri Rabindra Nath Nayak, Chairman and Managing Director of Powergrid Corporation of India Ltd.



- Professor Somnath Ghosh, Michael G. Callas Professor in the Department of Civil Engineering and Professor of Mechanical Engineering at the Johns Hopkins University.

## RESEARCH AND DEVELOPMENT ACTIVITIES

**Aerospace Engineering:** Research activities are being carried out in different fields, namely, Composite and smart structures, Structural dynamics and aeroelasticity, Design and development of MR-fluid damper, Analysis of aerospace structures using DQM, DTFM, FEM, Nanomaterials and nanomechanics, Development of reconfigurable autonomous air vehicle, Lunar gravity modeling, topography modeling and orbit determination for the Chandrayaan-I, Fault tolerant and reconfigurable architecture development for the automotive, Real time system identification, system identification using neural sensitivity analysis, Fault detection and identification for aircraft, Low Reynolds number airfoils for micro air vehicles, Analysis of high Reynolds number three dimensional flows, Supersonic and hypersonic flows for various configurations, Large eddy simulation of turbulent flow, Flow-induced vibration and fluid-structure interaction, Development of micro-aerial vehicles.

**Agricultural and Food Engineering:** Current areas of research focus include the Application of GIS and neural network command area and watershed management, Ballast management of agricultural tractors, Biofiltration technology, Bio-fuels from tree-based oils, Biosynthesis of phenolic fragrance and xanthenes, Climate change analysis and applications in water and crop management, Coal biotechnology, Design and development of continually variable transmission for tractors, Design and development of slip meter for two-wheel drive tractors, Design and development of automatic depth control system and noise and vibration reducing device for tractors, Design and development of noise and vibration reducing device for vertical conveyer reaper, Development of aseptic packaging system for milk, Development of environment-friendly aquaculture, Development of rice transplanter, Development of endless chain pressure dryer for orthodox tea, Development of cashew nut sheller and peeler, Microwave assisted drying of high moisture food, Nutrient management, Polyhydroxyalkanoates from Cyanobacteria, Predicting traction performance using artificial neural network, Process technology for dehydration of mushrooms, Production and processing of tea, Production of tannase under solid state fermentation, Process technology for dahi powder and dahi powder based energy drink mix, Process technology for antioxidant rich RTE health food, Process technology for manufacture of RTE health food (herbal kurkure), Rainwater harvesting and groundwater recharge, Software development for machinery management, Spectral characterization of soils, Starch based edible and biodegradable film, Thermal analysis of food materials, Traction potential of bias-ply tyres used in agricultural tractors.

**Architecture and Regional Planning:** The Department focuses on areas such as Performance studies, Design simulation and intelligent architecture, Building automation and management systems, Sustainable development, Energy efficient design, Appropriate technologies, Spatial environmental planning, Eco- sensitive and green architecture, Indian traditional architecture and heritage studies, Vernacular architecture, Visual communication, Visual simulation, Product design and industrial design, Transportation planning, Traffic engineering and management, Hazards and disaster mitigation and management, Urban design, Eco-tourism, Recreation and landscape planning, Conservation and preservation studies, Housing and shelter, Social infrastructure, Urban development Management and finance, Advanced planning informatics, Geographical information systems, Decision support systems and Expert systems, Urban settlement and systems dynamics, Cultural studies, Media and architectural journalism, Symbolism and cultural sustainability.

**Biotechnology:** Research activities are being carried out in the following areas: Production of an anti-tumor biosurfactant, Alkaline lipase, Biodiesel, Bioremediation of heavy metals, radionuclides and organic pollutants, Development of methods of o-antigens and its relation with pathogenicity in Gram negative bacteria, Bioreactor strategies for the enhanced production of probiotic endospores for nutraceutical formulations and their clinical evaluation, Molecular

characterization of metronidazole activation and deactivation pathways in *Entamoeba histolytica*, Molecular cloning, expression and characterization of *E. invadens* encystation specific proteins, Structural and functional studies of protein from *M. tuberculosis* and *S. aureus* aiming at drug and inhibitor design, Biomicrofluidics and biochip development, Microbial fuel cell, Molecular cloning, expression and characterization of *E. invadens* encystation specific proteins, Molecular analysis of *cypovirus* infecting *tasar* silkworm, Development of low fat content transgenic oilseed plant, Development of silk (fibroin and sericin) based biomaterials and cell based tissue (skin and bone) engineering, Improvement of hydrogen production from industrial waste using hybrid bioreactor, and Characterization of *Antarctic microbiota* probiotic nutraceutical development.

**Chemical Engineering:** Current research includes chemical process development with special emphasis on greener alternatives, Utilization of non-edible oils for manufacturing of value-added chemicals, Steam reforming of petroleum feedstock in mini and micro-reactors for production of hydrogen, Advanced separation processes involving membranes with emphasis on water purification, dye removal, effluent treatment processes, Simulation and modeling of coal and biomass combustion processes in pulverized and fluidized combustors, Multi-phase processes and reactions in gas-liquid, liquid-solid, solid-liquid and liquid-liquid systems using pipelines, ejector based systems, fluidized bed, column flotation, Development of innovative catalysts from fly ash for organic chemical synthesis (alkylation, isomerisation etc.), Plasma assisted surface modification for chemical engineering applications, Development and performance of novel bubble column scrubber/reactor for removal of SO<sub>2</sub> and fly ash, technology of composite materials, Pattern formation of soft materials utilizing interfacial instability, Microscale transport processes and microfluidics including droplet based digital microfluidics, Training of personnel for construction and maintenance of bio gas plants, Beneficiation of coal and mineral by column flotation cell.

**Chemistry:** The Department's areas of research include Synthesis of bioactive natural products, Enzyme mediated synthesis, Isolation and characterization of an angiogenic protein, Supramolecular chemistry, Development of highly selective and green methodologies, Development of micellar, zeolite, and bimetallic catalysts, Synthesis of advanced functional materials for fuel cell application, Crystal engineering and electroanalytical chemistry, Development integrated biosensing platform for clinical and environmental applications, electron transfer processes with emphasis in dioxygen chemistry, Colloidal systems, especially vesicles formed by chiral surfactants and their potential applications in i.v drug delivery, Development of hydrogels and organogels for applications in transdermal drug delivery, Aqueous medium polymerization, metal nanoparticles, nanocrystalline ferrites, ceramics and composites, Materials for high temperature and superconducting applications, Studies relating to density functional theory, chemical reactivity, *ab initio* calculations, quantum chaos, chemical reaction dynamics in liquids and biological macromolecules, molecular modeling and computer simulation studies of complex biological systems.

**Civil Engineering:** Research activities are being carried out in the following areas: Application for wastewater treatment and energy recovery, Onsite treatment of domestic sewage from small community, Studies on granulation in UASB reactor treating low strength wastewater to enhance efficiency of the reactor, Water quality and health assessment, Biological treatment of solid waste, Factors affecting the use of chlorine in water supply systems, Nanoparticle synthesis, their characterization and application, Photodegradation of organic pollutants, Adsorption/adsorption, Monitoring and modelling of tropospheric solid state polydisperse aerosols and ozone and assessment of pulmonary deposition, Recycled construction materials, Stability of plates and shells, Biomechanics, Reliability of bridge structures, Low cost housing, Seismic analysis of dams, Fluid-structure interactions, Structural health monitoring, Cell filled low cost rural roads, Analysis and evaluation of concrete and flexible pavements, Specifications for bituminous mixes and urban

transportation planning, Investigations of effect of lateral flow on turbulent submerged jets, Study of coherent turbulent structure over gravel beds and bed-forms, Development and application of flood inundation and urban flood simulation models, Drought characterization and forecasting, Erosion control and mechanical stabilization of soils using natural fibers, Ground improvement, soil-microbe interaction, Insitu testing, Geotechnical earthquake engineering, Landslides and slope stabilization.

**Computer Science and Engineering:** Current research includes Artificial intelligence, Bioinformatics, Combinatorial and computational geometry, Computer graphics, Digital geometry, Design and analysis of algorithms, Graph / hypergraph theory and algorithms, Computer networks, Cryptography, Hardware security, Computer architecture, Databases, Embedded systems, Fault tolerant computing, Formal verification, Image processing and computer vision, Mobile computing, Multimedia, Natural language processing, Object oriented design tools, Parallel and distributed processing, Real time systems, Software engineering, Speech recognition and synthesis, VLSI Design and CAD tools, Complex networks.

**Electrical Engineering:** Research is being carried out in Magnetic levitation, Superconducting magnetic energy storage, Variable frequency AC-Drives, Resonant converters, Design of integrated circuits for power management, Automotive electronics, Diagnostic of drives, Drive fatigue analysis, Neuro-fuzzy controllers, Control of chaotic systems, Fault-tolerant control of aero-space systems, Attitude control of satellites and launch vehicles, Control of variable air-volume air-conditioning systems, Bifurcation theory of hybrid dynamical systems, Delta domain digital control analysis and design, Decentralised control of large scale systems, Wind turbines, Power system dynamics, Power system protection, Intelligent relaying, State estimation of power systems, Neural net application to partial discharge phenomenon, Lightning protection, Material characterization, Laser based profile measurement, Image based measurement systems, Motion estimation using MRI and colour Doppler imaging, Non-Linear and statistical signal processing, Real time algorithms for detection and diagnostics, Condition monitoring of machines and power apparatus, Fault detection and diagnosis of analog circuits, Control and instrumentation of bio-reactors, Fiber-optic components and sensors, Biomedical signal processing, Analysis of ECG signals, Sensors fusion, Multimedia security, Design and development of MEMS accelerometer, Seismic signal processing, active noise control, Fast algorithms for real time signal processing.

**Electronics and Electrical Communication Engineering:** The Department focuses on the Design and development of an embedded system-on-chip solution for an adaptive intelligent biomedical system, low cost Doppler Ultrasonography system, design of an Ultrasound Imaging system, development of non-invasive blood glucose monitor based on laser induced photo acoustic spectroscopy, early detection of oral cancer via image processing. Fiber optics and networking: The current research involves dispersion compensation of 40 Gb/s optical transmission system with optical phase conjugation and distributed Raman amplifier as well as with chirped fibre Bragg grating. In the optical networking area, innovative schemes have been developed for guaranteeing WDM network survivability and IP-over-WDM integrated routing, Development of a RISC DSP for Modems. Development of a dual standard baseband processor for 3G wireless systems, Automated visual inspection of industrial objects, VLSI Architecture for low bit rate video coding, Medical image processing, Gesture recognition from video sequences, Face recognition, Content based retrieval of texture images, Fuzzy neural network, Automated visual inspection of industrial objects, VLSI architecture for low bit rate video coding.

**Geology and Geophysics:** Current research focus includes Tectonic evolution of craton – mobile belt ensembles in parts of the Indian shield, Gold mineralization in greenstone belts of Dharwar Craton, Metamorphic remobilization of massive sulphide deposits, Studies on Indian microvertebrates,

Lithospheric structure across Himalaya, Deformation at collisional boundaries, Stable isotopes in Himalayan foreland sediments, Paleogene climate of Kutch, Rajasthan, Environment in ancient sedimentary basins in India, Seismic hazard assessment and microzonation in the NE India and metropolitan cities, Improvement of rock index test methods and mechanical characterization of rock materials, Groundwater potential assessment and pollution by natural and anthropogenic causes, Waste utilizations, wasteland development and acid marine drainage, Natural radiation hazard estimation, Studies on Indian monsoon (both modern and ancient) and paleoclimate studies of the Indian subcontinent and paleoceanography of the Indian Ocean.

**Humanities and Social Sciences:** Research is being carried out in Quantitative economics, Financial economics, Economics of growth, Industrial economics, Development economics, Environmental and resource economics, Developing world bioethics, Gender and trade, Financial institutions and markets, Sociology of health and medicine, Human resource Development, brain and behavior, Interpersonal, intercultural and organizational communication, Visual aesthetics, Indian aesthetics, Translation studies, Literature and communication, Business ethics, Corporate social responsibility, Economics of biofuels, Bioethics and public health ethics. Special focus is on studies involving end of life care, the science of generosity, music and audience response, Indian art and aesthetics, creative economy, and food security.

**Industrial and Systems Engineering:** Research activities are being carried out in the following areas: Operations management: Production planning and inventory control, Logistics and supply chain management, E-Business, Quality Engineering and control, Facility layout and design, Total quality management and Six Sigma. Simulation and soft computing: Genetic Algorithms and its variants, Heuristics, System dynamics, Discrete event Simulation. Work system design: Ergonomics/human factors engineering, occupational safety and health management, and probabilistic risk assessment, Data analytics and different domains of Industrial Engineering.

**Mathematics:** The Department focuses on Fuzzy Mathematics, Fluid Mechanics, Clifford analysis, Fuzzy Mathematics, Soft Algebra, Bio-Mechanics, Dynamics of nonlinear systems, Inventory management, Graph theory, Integral equations, Cryptography, Queuing theory, Statistical decision theory, Statistical data analysis, Compiler design, Combinatorics, Fractional calculus, Optimization theoretical computer science, Information and coding theory and cryptology.

**Mechanical Engineering:** Research areas include Design and development of expert systems in robotics, manufacturing science, Medical diagnosis and others using soft computing, bio-micro-fluidics and microscale transport processes, Transport phenomena in phase change problems, Laser materials Processing, CFD, Lattice Boltzmann Method in complex flows, Rotor dynamics and dynamics of lubricated ball bearings, Numerical simulation on two phase flow pertaining to bottom injected gas stirred ladles, Multi Layer TiN-MoS<sub>2</sub> coating on cutting tools by unbalanced magnetron technique, Machinability study of Inconel 718, Development of control strategies for autonomous underwater vehicles, Model based fault detection and isolation, Simulation of liquid sloshing in a tank using numerical grid generation techniques, Prediction of fluid flow and heat transfer from wavy surfaces, 3-D printing, Noise and vibration engineering, Lab-on-a-chip based devices, Smart composite materials and structures, Micromechanics of novel radially aligned carbon nanotube reinforced composites.

**Metallurgical and Materials Engineering:** Areas of research include Extractive metallurgy, Mechanical metallurgy, Melting, casting and solidification processing, Modeling, simulation and multimedia in Metallurgical Engineering, Physical metallurgy, Powder metallurgy, Corrosion science and technology, Surface engineering, Genetic algorithm for the optimization of metallurgical systems, Mathematical simulation of high temperature metallurgical systems by application of computational

fluid dynamics, heat and mass transfer, Molecular dynamic simulation of nanostructured materials, Development of Lithium Ion Battery (LIB) technology for applications in electric vehicles in India.

**Mining Engineering:** The Department's current focus areas are Application of LCA, GIS and remote sensing for soil and water analysis as a part of mine closure planning, Experimental and computational fluid dynamics studies for shock loss determination in mine air flow, Biological and passive treatment of mine waste water, Investigation of soil and water contamination vis-à-vis land use changes near mining fields. Study of human behavior related accidents in mines, Finite element analysis for long wall strata control problems, and design of shield supports, Assessment of fly ash composites as a substitute fill material for underground mine voids, Risk analysis for the safety management of coalmines, Application of various grade estimation techniques namely kriging, cokriging, stochastic simulation and neural networks for estimation of mining blocks for quality control in mines, Investigation of different statistical quality control techniques including univariate and multivariate control charts for controlling the grade of mineral at various locations, Grade control aspects in limestone and bauxite operation, Integration of GPS and ISAR ground deformation data over mining areas, Use of lasers for assessment of stability of dumps and vision based semi-automatic mine navigation system.

**Ocean Engineering and Naval Architecture:** Research is being carried out in Ship structures, Dynamics of marine vehicles, Wave-Structure interactions, Marine and ocean hydrodynamics, Marine design and production, Numerical hydrodynamics, Ocean turbulence CFD, Coastal marine hazards, Ocean structures, Marine structural analysis, Ocean wave and circulation modeling, Marine design and production, Welding technology, Coastal processes and engineering, Hydroelasticity, Storm surge prediction and Tsunamis, Suspended sediment dynamics, Marine acoustics.

**Physics:** The Department focuses on Astrophysical spectroscopy, Astrophysics, Atmospheric sciences, Atomic and molecular physics, Biophysics, Condensed matter physics, Physics of complex systems, Cosmology, Electronic properties of solids, ERP, Bio-Photonics, Optical imaging, Nuclear physics, Ferroelectricity, Fiber and integrated optics, Optoelectronics, Gravitation and geometry, High energy physics, Hydrodynamics, Laser physics, Nonlinear optics, Photonics, magnetic semiconducting nanoparticles and thin films, magnetism, Spintronics, Materials engineering, Mathematical physics, Mechanical and magnetic stress, Microprocessors based systems, Monte Carlo simulation of radiation detectors, Semiconductor devices, Nano- and bulk-material science, Nanostructured magnetic materials, Magnetic thin films and multilayers, Multiferroics, Nanotechnology, Nonlinear dynamics, Nonlinear instabilities, Nuclear condensed matter physics, Nuclear structure, Double Beta decay and Neutrino physics, Optoelectronics, Organic electronics, Particle and cluster emission in fission and fusion-fission, Physics of semiconductor crystals and thin films, Quantum many-body theory, Radiation measurement techniques, Radiation sensors and dosimetry, Renewable energy sources, Semiconductors, Nanostructures, Solid state ionics, Thermoelectricity, Web based services, Engineering and characterization of materials using ion beams, String theory, Superconductivity.

**Centre for Educational Technology:** Under National Programme on Technology Enhanced Learning, CET, IIT Kharagpur has already developed 186 courses (7,440 hours of video courses) as a part of NPTEL phase I & II which are available in the LAN for internal feedback. Development of suitable pedagogical methods for various classes, intellectual calibers and research in e-learning is underway. 90 courses have been completed in the pilot phase. These courses consist of detailed curriculum documents for each course with instructional objectives, assessment and references to learning resource materials. Creation of Integrated Development Environment (IDE) for generation of pronunciation lexicon for Indian languages (PL-IL) in W3C Pronunciation Lexicon Standard (PLS) and example lexicon in Hindi and Bangla languages have been initiated.

**Centre for Oceans, Rivers, Atmosphere and Land Sciences:** Areas of study include Ocean modeling for Bay of Bengal, Indian Ocean and North Indian Ocean, Observation and modeling of thunderstorm, Modeling and prediction of tropical cyclone, Study of forest biomass and carbon sequestration, Monsoon meteorology, Air pollution study, Observations and modeling of land surface processes, Mesoscale and land surface data assimilation, Cloud microphysics, Cryospheric studies, Satellite oceanography.

**Cryogenic Engineering Centre:** The Centre carries out a number of activities including teaching at UG and PG levels, sponsored research and consultancy on various areas, focus on Continuing Education through training engineers from industries, faculty from academic institutions, and scientists from R&D organisations in specialised areas like Cryogenic Engineering, Air separation, Vacuum technology etc.

**Materials Science Centre:** Research focus includes Novel polymers, ceramics and semiconductor materials, Polymer modification, Synthesis of new polymers for application as electronic materials, Membranes for gas separation, Nano-clay and carbon nano-tube reinforced composites for automobiles and other high performance speciality applications, Welding thermoplastics, Recycling waste polymers and direct fluorination of polymers, Synthesis of nano-crystalline shape memory materials for biomedical applications, Nano-fluids, nano-ceramics for drug delivery, nano-structured oxides for ceramic gas sensor and cathode materials for lithium rechargeable batteries, Ferroic and multiferroic thin/thick films, sensors magnetic and magnetocaloric materials, Novel inorganic and organic semiconductor materials are being synthesized and characterized for various electronic and optoelectronic applications, MOCVD growth of InGaP epitaxial layers as well as quantum dots are also being carried out for various applications such as solar cell, etc., Synthesis and characterization of wide band gap materials like SiC, ZnO and nitride semiconductors and nano materials for device applications, Multiwall carbon nanotubes are also being synthesized by CVD on silicon substrates.

**Reliability Engineering Centre:** The Centre conducts research in Virtual Lab (under construction) on fault diagnosis of rotary systems useful for virtually creating certain faults in rotating systems and then diagnose the fault and its severity, Remote monitoring system (under development) for fault diagnosis of industrial system which can be used for e-maintenance. Other activities include organizing short term courses on latest topics of Reliability Engineering for officers and engineers of the Industry, Defense Organizations and R&D Establishments, Safety and reliability studies of nuclear power plants and missile systems are other activities.

**Rubber Technology Centre:** The focus areas of research for the Centre are Polymer composites and nanocomposites, Chemical modification of rubbers, Thermoplastic elastomers based on novel blends and alloys, Recycling of rubber waste, Ionomers, Conductive rubber composites for electrical and electronics application, Electron beam modification of polymers, Rheology and processability of rubber compounds and polymer blends, Polymer foam and microcellular rubber composite for various critical and industrial applications, Development of rubber blends and composites for different industrial application like cable, oil seal, tank track pad, vibration isolators, high voltage insulators, Development of adhesives and coatings, Development of biodegradable polymer and recycling of rubber and polymer, Controlled radical polymerization, Development of polymers for biomedical application.

**Rural Development Centre:** Current focus includes Essential oil production technology, Fish feed production from non-conventional biological sources, Farm level technology for processing of agricultural products. Transfer of agricultural products processing technology, Organization of training and workshops on rural technology application.

**G. S. Sanyal School of Telecommunications:** The School emphasizes research on Radar signal processing, BioMedical signal acquisition and processing, MAC protocols in Wireless adhoc networks and WMAN, Physical layer technologies for next generation cellular, Wireless communications and networking, Optical communications and networking, Statistical signal processing, Loss-less compression methods for images and pictures, Channel estimation and equalization method for multi-carrier wireless, Synchronization algorithms for OFDM based wireless transmission, Wireless sensor networks.

**Rajiv Gandhi School of Intellectual Property Law:** Research is in areas such as Corporate legal affairs with special reference to corporate governance under the IICA, River basin management, Development of law and policy framework with special reference to Ganga, Creation of multimedia based courseware for E&IT students to be implemented by IIT Kharagpur, Plant metabolic pathway laboratory, Implementation of feature in the Indian Patent Office Search Platform-IPATS, GI registration and post registration measures of traditional handloom textiles from Orissa, Intellectual property education, research and public outreach programme, Legal and policy framework in renewable energy sector, Corporate governance in energy sector in India, etc.

**Ranbir and Chitra Gupta School of Infrastructure Design and management:** Planning, design, operation and management of highways, airport and seaport infrastructure, Planning, design, operation and management of water supply and waste management systems, Environmental impact assessment, Urban infrastructure planning and design, Facility programming and specialised building design, Building automation systems design, Building management systems, Regional infrastructure planning and construction, Planning, design, operation and management of thermal, hydel and nuclear power plants, Renewable power plants, Power generation, transmission and distribution, power system planning and reliability, Infrastructure project management infrastructure financing and infrastructure regulatory issues are the School's key areas of research.

**School of Information Technology:** Research focus includes Development of architectures, protocols and algorithms for mobile ad-hoc networks, vehicular ad-hoc networks, wireless sensor networks and wireless mesh networks, smart grid communications, cloud computing, Enterprise-wide GIS database development and its policies and protocols, Development of user interfaces for the under privileged users such as language illiterate, physically disabled etc., Application of Information Communication Technology (ICT) for the mass such as multimodal interaction, multimodal text composition mechanism, user modeling, interface adaptation, personalization, Computational modeling to brain for informatics, cognitive behavior is also another active area of research, Characterization and incorporation of emotions in speech, speaker recognition system for handheld devices in varying background environments and development of Text-to-Speech (TTS) system for Indian languages, Penetrating testing, development of new algorithms for cryptography, their efficient and attack-resistant hardware implementation etc., Survivable information system architecture to tolerant with potential information warfare attacks.

**School of Medical Science and Technology:** The School conducts research in various areas including Development of micro-fluidic biochips / bio-MEMS for medical application, Laser speckle imaging of blood-flow in microcirculation, Development of statistical analyzer & disease pattern recognizer for Oral pre-cancer and cancer, Design of an intelligent diagnostic tool through the extraction of diagnostic rules for asthma, Proteomics and reproductive health, Vaccine preventable diseases in HIV infected children, Integrated macro and micro-imaging on various healing and non-healing wounds including oral and breast precancer and cancer for their early characterization through image processing and analysis, Physico-chemical characterization of natural wound healing agents for the development of wound dressing technology, Development of detailed database on respiratory rhythms for identifying their temporal and spatial characteristics in health and disease, Development of biodegradable scaffold for tissue engineering and wound research, In vitro screening of anti-diabetes molecules, Design of a three dimensional scaffold and drug

delivery system in arthritic hip joint, Signal transduction and cancer biomarker, Oxidative stress and infertility, Development of natural antioxidant nanoparticles, Proteomics and metabolomics in reproductive health, Nutraceuticals and herbal medicine.

**School of water Resources:** The School focuses on Surface and groundwater modeling of the lower Ganga basin between Farakka and Ganga Sagar, Land use and land cover dynamics study in Mahanadi river basin, Urban water supply and waste water management, Development of a pollutant transport model for meso- scale application.

**Vinod Gupta School of management:** Important areas of research for the School include Big data analytics including financial analytics, marketing analytics and HR analytics, Banking, Derivatives and risk management, Project management, Conducting management development programmes and in-house training programmes for various industries.

## **INFRASTRUCTURE DEVELOPMENT**

A core component of any technological institute is its infrastructure. The Institute constantly upgrades its existing facility and keeps on adding new ones. Listed below are some recent additions.

**Aerospace Engineering:** ePIV System including hardware and FLOWEX Software for Particle Image Velocimetry System meant for Laboratory demonstrations in Aerodynamics Laboratory, DataTaker DT80 Logger with accessories, which is a general purpose data acquisition system with 5 channels for strain measurements, 3 DOF Gyro Workstation (QPID/QPIDe)-Quanser for Flight Mechanics and Control Laboratory, Pulsejet Nozzle AA 10000 JJAU-VI, Spraying Systems Co., for Propulsion Laboratory.

**Agricultural and Food Engineering:** Microprocessor controlled testing machine-5KN, Instron, USA.

**Architecture and Regional Planning:** Digital-cum-computerized Universal testing machine model MUTC- 60 Capacity 600KL.

**Biotechnology:** Mercury/ Hydride system, Horizontal high pressure steam steriliser, Laminar flow, Sonicator and ultra sonicator, Filtration system, PH meter with electrode, Typhoon, Spectrophotometer, Ice flaker, Millipore water purification system, Incubator shaker, Akta Purifier UPC-10, CO<sub>2</sub> Incubator.

**Chemical Engineering:** Cluster computer, High speed parallel computing server, High speed camera, Stereo zoom microscope, Plasma source, Gas manifold purification system, Autolab, Ion Chromatograph.

**Civil Engineering:** Seismic piezocone, In situ testing vehicle, MASW system for shear wave velocity profiling, Resonant column for small strain dynamic testing system for soil, Digital direct shear apparatus for soil testing, Carry Eclipse Fluorescence Spectrophotometer, GC, Autolab potentiostat / Galvanostat, Online water quality analyzer, etc., Shaker table for earthquake simulation.

**Geology and Geophysics:** Two Stable Isotope Ratio Mass Spectrometers (IRMS), State of art MC-ICPMS Laboratory, Ground penetration radar system (GSSI SIR-3000) with multi- low frequency (16-80 MHz) and 2000 MHz Bistatic antennas for geo-exploration, Low level portable Gamma NaI (TI) based gamma ray scintillation equipment.

**Mathematics:** Dell desktop computers - 60 units, Online UPS 30 KVA - 1 Unit, HP Heavy duty Photocopying machine -1 unit, HP Laserjet P3015 Printer -1 unit.



**Mechanical Engineering:** Micro bath, PHD Ultra I/W programmable syringe pump, ANSYS academic research software, Experimental module optical elasto-hydro-dynamics, CVC 10MR, Motorized pendulum impact test M/C, Plasma hand-held Gun, Zeiss stereo microscope, Micro hardness tester, Fiber coupled laser diode system, Friction stir welding machine, Portable TIG welding machine, Upgrade of rapid prototyping system, Micrometer, Climatic chamber.

**Metallurgical and Materials Engineering:** Fully Automated sequential WD X-Ray Fluorescence Spectrometer, Vibratory polishing Vibromet 2 set-up, ECOMET 250 Grinder Polisher set-up, 12 kW-80kV Electron Beam Welding Setup.

**Mining Engineering:** Total Kjeldahl nitrogen apparatus, Atomic absorption spectrophotometer (Graphite furnace), Thermal gradient-differential scanning calorimetry, Oblique shear Equipment, Electronic lateral extensometer and compressometer, Rock classification hammer, Field density by large sand pouring cylinder, Pycnometer, Rapid moisture meter, Dynamic cone penetration test apparatus for determination of cohesion and angle of internal friction, Pocket penetrometer, Proctor penetrometer, Soil permeameter, Rock permeability apparatus, Rock cutting machine, Diamond cutting saw, Field CBR test apparatus, CBR mould, Beam mould, Portable swelling pressure and heave evaluating apparatus, Universal triaxial cell, Digital direct shear apparatus hydrometer with hydrometer Glass jar, Respo CO analyser, LUX meter, Digital barometer, Anemometer, Pitot tube, Wireless sensor network application kit, Self-contained compressed oxygen breathing apparatus, Spirometer, Triaxial whole body and hand arm vibration meter, Depth perception meter, Eye fatigue tester, Bicycle ergometer, Anthropometer.

**Centre for Educational Technology:** The video studios are being updated to HD (High definition) system and new sets of instruments like camera, switcher etc are being installed, Upgradation of M Tech software laboratory, Upgradation of project laboratory, Installation of new pedagogy server.

**Materials Science Centre:** Solar simulator system, Photoluminescence system, Differential scanning calorimetry, Thermogravimetric analyzer, Probe station, Thermal conductivity measurement system, Universal tensile testing machine, Internal- Mixer, PE Loop, Keithley 4200, Gas permeation apparatus.

**Rajendra Mishra School of Engineering Entrepreneurship:** Monte Carlo simulation software, Work stations with 2X Intel Xenon processor, Heavy duty scanner and printer added to faculty facilities.

**Rubber Technology Centre:** DSC/TGA, Optical microscopy, Goniometer, Magneto Rheometer, GPC, Dynamic light scattering analyzer, Electrochemical Workstation, Modulated DSC.

**School of Water Resources:** Double Ring Infiltrometer, and Automatic Rainauge.

### **Infrastructure Development in the Institute**

As a part of the ongoing infrastructural development to cater to the needs of a growing student, faculty and staff population, the following projects have been taken up by Estate Civil Head Office. Major developments in the recent months are outlined below.

- Student accommodation: 390 rooms of B. R. Ambedkar Hall of Residence have been opened to boarders. Renovation of 118 capacity Girls' Hostel in the old Kendriya Vidyalaya has been completed and 76 rooms have already been handed over to HMC.
- Nalanda Classroom Complex: 58 classrooms have been handed over and 30 classrooms have been completed for use.
- J. C. Ghosh Science Block and P. C Roy Laboratory Block: Floor slabs for both the Blocks up to 7th floor have been laid.

- A. J. C. Bose Laboratory Complex: Construction of extension building is being expedited and all laboratories have been handed over for use.
- New water supply project: 8.40 km of pipelines have been laid. Construction at river bed is going on.
- Development of children's parks in Campus: Six children's parks have been developed within the Campus.
- Expansion work in academic buildings: Expansion work in the departments of Industrial and Systems Engineering, Chemical Engineering, Mechanical Engineering and Computer Science & Engineering have been completed. Expansion works of Department of Architecture & Regional Planning, Materials Science Centre, SMST, NCC etc. are in good progress.
- Construction of A-type faculty apartments: RCC frameworks have been completed for two blocks. The first block with 28 apartments is scheduled to be completed in August, 2014 and the balance 28 flats will be handed over in December, 2014.
- Construction of Nivedita Hall of Residence: Work has been completed and students have moved in.

## **INTERNATIONAL RELATIONS**

The Institute and the members of its faculty make active efforts in establishing relationships with universities abroad. Every year faculty members visit universities across the world on various academic programmes. These result in signing of Memoranda of Understanding with them. During the academic year 2013-14 agreements were signed by the Institute with:

- University of Tokyo, Japan
- National Chiao Tung University, Taiwan
- University of Dublin, Ireland

The Institute also had a number of visitors from international universities with whom possibilities of active collaborations were discussed. Some of these were, Rhein Waal University of Germany, Melbourne University, Wollongong University, Queensland University and Curtin University of Australia, Southampton University, Warwick University and University of Hull of UK.

Significant student interactions also took place with Warwick Manufacturing Group, University of Warwick, UK and Curtin University of Australia.

## **RELATION WITH NATIONAL ORGANISATIONS**

The Institute maintains its relationship with a number of national organizations related to academic as well as professional matters. During the academic year 2013-14, the Institute has signed Memoranda of Understanding with the following national organizations.

- Confederation of Indian Industry, Eastern Region, Kolkata
- Tata Medical Centre, Kolkata
- Hindustan Aeronautics Limited
- Gujarat Mineral Development Corporation

## **SPONSORED RESEARCH AND INDUSTRIAL CONSULTANCY**

The academic excellence of an educational institution stands on its research capability, where learning and innovation complement each other. IIT Kharagpur has been committed to developing and maintaining the highest standards in both fundamental research as well as applied research. The

wide variety of engineering sciences at IIT Kharagpur provides a unique environment that fosters inter-disciplinary research in areas of cutting edge technology such as energy, nanotechnology, semiconductors, bioengineering, and computational sciences. The diversity of in-house expertise at IIT Kharagpur has also catalyzed the development of a healthy ecosystem for large-scale industrial collaborations in multi-disciplinary areas such as automotive control software, railways research, steel technology, petroleum and biofuels research, industrial robotics, and many more. IIT Kharagpur's research programmes reach across the campus and beyond, linking together 19 departments, 16 academic centres and a large number of advanced R&D laboratories, stimulating the integration of inquiry, new knowledge, and education.

The year 2013-2014 has been a landmark for IIT Kharagpur in terms of its outreach towards ambitious science and technology missions of national importance. The new research portfolio includes the following missions:

1. **Food Sustainability:** This includes technology for food production, processing and distribution logistics. This mission brings together researchers from agricultural engineering, biotechnology, operations research and industrial engineering.
2. **Future of Cities:** Technology for the development and maintenance of our cities and future cities. This includes building technology, road and pavement technology, waste and hygiene management, traffic, age friendliness, and governance. This mission brings together researchers from Civil Engineering, Architecture and City Planning, Industrial Engineering, Computer Science, and Law School.
3. **Signals and Systems for Life Sciences:** Technology for leveraging biometric signal processing for analysis, prognostics, diagnostics and affordable healthcare. This mission brings together researchers from Electrical, Electronics and Telecommunication Engineering, School of Medical Science and Technology, Biochemical Engineering, Computer Science and Information Technology and practicing medical professionals.
4. **Artificial Intelligence for Societal Needs:** Technology for knowledge discovery and intelligent decision making for solving problems in the sectors of energy, climate, water, disaster management and traffic. This mission brings together researchers from Computer Science, Electrical and Energy Engineering, Environmental Sciences, Geology and Geophysics, Civil Engineering, Humanities and Social Sciences, and Architecture.
5. **SANDHI-Science-Heritage and Creative Economic Projects:** Technology for preservation, archival, development and scientific exploration of our heritage. This mission brings together researchers from Architecture, Humanities and Social Sciences, Geophysical Sciences, Computer and Information Sciences, Electrical Sciences, and Management.
6. **Centre for Robotics:** Technology for robotics, unmanned intelligent vehicles, intelligent exploration and surveillance, biomedical and nano-robotics. This mission brings together researchers from Mechanical Engineering, Mining Engineering, Electrical Sciences, Computer and Information Sciences, Material Science and Architecture.
7. **Centre for Microfluidics:** Technology based on micro-fluidics for mechanical, biomedical, chemical and semiconductor processes. This Centre brings together researchers from Mechanical and Chemical Engineering, Biomedical Engineering, Material Sciences, and, Computer and Electrical Sciences.

The above initiatives have leapfrogged the intake of research students at IIT Kharagpur and have created new exciting brands of research and career building. In yet another iconic step having historic ramifications towards promoting research excellence, the institute has launched several types of challenge grants for developing individual and collaborative research infrastructure in the Institute. Seed grants towards infrastructure development for departmental and collaborative research include:

- Setting up an advanced membrane separation facility in the Department of Chemical Engineering
- Setting up an interdepartmental bio-informatics research facility combining wet labs and computational facilities
- Development of a facility for design, development and testing of next generation telecom gears at the School of Telecommunications
- Setting up an automated servo-controlled direct shear-cum- triaxial testing machine with computer control system and power pack at the Department of Mining Engineering

New research endeavors seeded under the new challenge grants include the following:

- Plant on a chip
- Next-generation secured Internet of Things (IOT)
- Design, synthesis, and advanced applications of new polymers and polymer composites
- Studies on ultrafast processes for electronic, spintronic, magnonic and photonic applications

In addition to the above projects awarded to groups of researchers, 19 individual seed grants were awarded on a competitive basis to individual faculty members in various areas, and 4 high-value research grants were awarded on a competitive basis for inter-departmental collaborative research problems of strategic significance. In order to promote social awareness and for the greater benefit of the Institute and its neighborhood, 15 challenge grants were awarded for research and development leading to service to the society.

The total funding received by IIT Kharagpur in the last 5 years is more than 630 crore, through 1513 Research and Consultancy Projects. During the year 2013-2014 the Institute received from the Government, private and international funding agencies/ enterprises 193 research projects having a total value of Rs. 149.31 crore and 125 consultancy projects worth Rs. 12.83 crore aggregating a total of 318 projects worth Rs. 162.14 crore.

Some of the noteworthy research initiatives and collaborative research facilities created in the recent past in the Institute include:

- Centre for Railway Research
- P. K. Sinha Centre for Bio-energy
- Tea Engineering Research Centre
- Centre of Excellence in Information Assurance
- National Programme in Marine Hydrodynamics
- Vodafone-Essar-IIT Kharagpur Centre of Excellence in Telecommunications
- Rural Technology Action Group (RUTAG)
- Advanced VLSI Design Laboratory
- Intel Embedded Innovation Laboratory
- Synopsys CAD Laboratory

In the past year IIT Kharagpur has received a number of high-value and flagship projects from the government and the industry such as:

- Connectivity and role of inhibitory neurons in auditory perception
- Evaluation of the applicability of a dominant nuclear male sterility system in rice for hybrid seed production

- Measurement to Management (M2M): Improved water use efficiency and agricultural productivity through experimental sensor networks
- Stope design and stability, production and paste backfilling
- Improving groundwater levels and quality through enhanced water use efficiency
- Development of remote educational centres in Eastern India
- Post disaster situation analysis and resource management using delay tolerant peer to peer wireless networks
- Indigenous design methodologies for elliptic curve cryptography on FPGAs
- Generation of insect resistant sweet sorghum plant
- Requirements for delivering RISUG pre-loaded syringes
- Clinical decision support system and self-learning tool for radiologists for lung CT using content based image retrieval
- Design and synthesis of coordination polymers and coordination induced gelating materials exploration of gas absorption
- Fundamental studies on the reduction kinetics, heat and mass transfer during reduction of iron ore coal composite pellets in rotary hearth furnace
- Asymmetric catalysis TOS/DOS of nitrogen hetero-cycles
- A study of the operation and control of a proposed voltage source converter based HVDC transmission highway with offshore wind power integration
- A study of hybrid controllers for transmission and high voltage distribution applications
- Generation and applications of photo addressed surface gaps.
- Industrial scale investigation for the fabrication of wear resistant ceramic tiles using coal ash
- Engineered silk matrices for optimization of in-vitro 3D tumor model
- Evaporative drying assisted meso-patterning under lateral confinement
- Tuning of metal and metal oxide nanostructures for super-hydrophobicity
- High resolution Bay of Bengal circulation using adjacent point source river discharge
- Exploration of microbial diversity and function in acid mine drainage and mine tailings
- Extensional rheometer for microscale samples
- Synthesis of Al-based bulk metallic glass composite with improved ductility via mechanical alloying and spark plasma sintering
- Study on mill tiling based composites as backfill material in uranium mines
- Improvement of energy recovery from waste water by dark fermentation followed by microbial fuel cells
- Development of membrane electrode based portable e-tongue device for rapid taste characterization of tea

**The Intellectual Property Rights and Industrial Relations (IPR & IR) Cell** under SRIC is responsible for the licensing and the transfer of technologies developed by researchers at IIT Kharagpur to the commercial sector. Till date, more than 400 patents have been filed and more than 120 have been granted and a total of 19 technologies have been transferred. This year, the IPR&IR Cell under SRIC carried out a special patent drive on the lines of the “100 Days 100 Patents” initiative of the previous year. The Institute faculty members, students and staff support and respond whole-heartedly to this activity leading to submission of more than 200 abstracts. More than 100 patent applications have been sent out to patent attorneys for the filing applications to patent office under this drive.

**The Entrepreneur Cell** under SRIC supports a variety of incubation programmes funded by the Government.

Various student activities are encouraged and supported through SRIC. Notable activities include the following:

- TeamKart activity for design and implementation of single seat racing car: Formula Student (FS) is Europe's most established educational motorsport competition, run by the Institution of Mechanical Engineers. It seeks to challenge university students to conceive, design, build, cost, present and compete as a team with a small single-seat racing car in a series of static and dynamic competitions. Recently IIT Kharagpur team has participated in Silverstone track in UK.
- RoboSoccer activity for design and implementation of a team of soccer playing robots: The Federation of International Robo- soccer Association (FIRA) arranges the FIRA cup. The team from IIT Kharagpur participated in this competition last year under the MiroSot category, where participants need to devise artificial intelligence strategies, and develop sharp sensing and precise real-time control for the physical soccer-playing robots.
- TeamAGV activity for design and implementation of autonomous ground vehicles: The team has participated in the Intelligent Ground Vehicle Competition (IGVC).
- TeamAUV activity for design and implementation of autonomous underwater vehicle: The team participated in the 3rd National Students Autonomous Vehicle competition earlier this year.

In addition to the above, students are also involved in several areas of innovation such as the green policy initiative that aims to reduce the carbon footprint of the campus through technology advances.

### **SCIENCE AND TECHNOLOGY ENTREPRENEURS' PARK, IIT KHARAGPUR**

Science and Technology Entrepreneur's Park, IIT Kharagpur, the core of IIT Kharagpur entrepreneurship ecosystem, is dedicated to extend every possible support for promotion and development of innovation and entrepreneurship in this country. Since its inception over 26 years ago, STEP has been engaged in various kind of activities to enhance the economic condition of this part of the country through innovation and enterprise creation. It has gradually transformed itself into a sustaining innovation and entrepreneurship ecosystem as well as enterprise creation platform. It is the most active innovation and incubation activity hub within the entire IIT system. STEP provides leading-edge financial, managerial, technical, legal and expert mentoring support to innovators and entrepreneurs in and around Eastern India. In association with various departments of state and central government and nodal agencies, it facilitates various kinds of financial support, i.e., financial grants and seed loan facilities for product development and enterprise creation. STEP, IIT Kharagpur, is at present headed by Prof. Indranil Sen Gupta of the Department of Computer Science and Engineering. STEP has achieved a great deal of success in the field of entrepreneurship and incubation in the last one year. A number of new incubators have moved into the scene due to immense infrastructural growth. STEP now offers 4,500 sq. ft of office space at its Gopali Campus which is now in use and proposes to create a Science Park at Gopali Campus for entrepreneurs who wish to venture into STEP. STEP Campus at IIT Kharagpur has also enriched itself by creating twenty new cubicles for entrepreneurs to incubate. Since June, 2013 a total of 18 new companies have been incubated at STEP. At present, 86 companies are being incubated in various domains such as information and communication technology, health care, manufacturing, agriculture, electrical, electronics, chemical, waste management, renewable energy domain.

STEP has always been an immense prospect for Start-up companies as it provides mentoring support to Start-up companies by tagging them with IIT professors. It also provides technical knowhow and technology transfer facilities to its entrepreneurs. STEP IIT Kharagpur has facilitated various kinds of financial grants and seed support to innovators and entrepreneurs. Since June 2013, around Rs. 57 lakh grant money to 4 innovators have been approved for funding through Promoting Innovations in Individuals, Start-ups and MSMEs (PRISM) supported by DSIR and Rs 11.25 lakh grant money to 2 microenterprises by the Department of MSME, Govt. of India for scale up and also to facilitate ample

funds for technology transfer and commercialization through TIETS funding. Since June 2013, STEP and TIETS have disbursed around Rs 49 lakh of seed support to 4 startups like M/s Suncraft Energy Pvt. Ltd., M/s Auro Robotics Pvt. Ltd., and M/s Red Button Software Labs Pvt. Ltd.

A high-tech VLSI product design and testing lab is available for the *incubatees* which fulfills the fast prototyping, design and test measurement requirements of Techno Entrepreneurs.

STEP, IIT Kharagpur has organised a number of programmes, such as TIFAC-SIDBI Technology Innovation Programme (SRIJAN) on 10<sup>th</sup> January, 2014; The Global Entrepreneurship Summit (GES) on 10<sup>th</sup> January 2014; TIETS-TIDE–Screening Committee Meeting & TDB Screening Committee Meeting on February 7, 2014; STEP Entrepreneurs’ Meet & PRISM Awareness Camp on March 29, 2014. Prof. Paul Lillrank (Aalto University, Finland) visited STEP, IIT Kharagpur in January, 2013 and delivered lectures on “Quality Management for Entrepreneurial ventures”.

## **CONFERENCES, SEMINARS, SYMPOSIA AND WORKSHOPS**

### **Department of Agriculture and Food Engineering:**

- CII-IIT Certified Food Professional Course on Food Safety & Quality Management (2 weeks)
- Farmers Field Day, Bishnupur, Bankura (September 25, 2013)
- Food Processing & Preservation – Food Grains / Fruit-Vegetable Processing (January 20-22, 2014)
- Greenhouse Management and Plasticulture in Horticulture (September 30-October 1, 2013)
- Micro-irrigation and Plasticulture Technologies for Horticultural Crops (May 25-26, 2013)
- On-site waste water treatment and management (June 31 to July 11, 2014)
- Plasticulture Applications in Horticultural crops (April 25-26, 2013)
- Precision Farming in Horticulture (December 16-17, 2013)
- Protected Cultivation Technology (October 22-23, 2013)
- Scope of Greenhouse and Plasticulture in Horticulture (January 16-17, 2014)

### **Cryogenic Engineering Centre:**

- Cryogenic air separation-2014 (March 22-27, 2014)
- Cryogenic Technology: Materials, Processes & equipment (February 17-21, 2014)
- Prevention of fire in oxygen-enriched systems-2014 (March 28-29, 2014)
- Two week course on Vacuum Technology and Process Applications (November 18- 27, 2013)

### **Department of Civil Engineering:**

- Finite Element Analysis for RDSO Engineers (5 days)
- In-service Training Programme on Hydrology and Water Resources Engineering (April 25-27, 2013)

### **Department of Computer Science and Engineering:**

- Computational Biology, Bioinformatics & their Application to Healthcare (October 28 - November 1, 2013)
- Computational Systems Biology (March 31, 2014 - April 04, 2014)
- Data Mining and Image Analytics for Medical Informatics (April 8-20, 2013)

### **Advanced Technology Centre:**

- Advanced DSP Design Techniques (June 27 - July 1, 2013)

- Electromagnetic Environmental Effects Management (E3) (Feb 17 - 27, 2014)
- One week Coordinator workshop on Fluid Mechanics (March 11 - March 15, 2014)
- One week Coordinator workshop on Signals and Systems (September 30 - October 4, 2013)
- One week Coordinators Workshop on Analog Electronics (April 1-5, 2013)
- Short term course on computation systems biology (March 31 - April 4, 2014)
- Short Term Course on Telecom Networks with State-of-the-art Hands-on Experiments (July 8-13, 2013)
- Two Week ISTE Main workshop on Analog Electronics (June 4-14, 2013)
- Two Week ISTE Main workshop on Signals and Systems (January 2-January 12, 2014)
- VLSI Signal Processing (December 3-7, 2013)

**Department of Humanities and Social Sciences:**

- Emotional Intelligence and Organizational Excellence (June 5-7, 2013)
- Training for Trainers (18-20 September 2013)

**Department of Industrial and Systems Engineering**

- Executive Training Programme on Project Management (May 11-14, 2013)
- One-Day Interaction Meet on 'UKIERI-sponsored Project on Environmental Performance of Industries (August 2, 2013)
- Short-term course on Service Science (July 08-12, 2013)
- Three-Day Duration Short-Term Course on 'Continuous Improvement and Process Excellence (LMW Executives at LMW Limited, Coimbatore)
- Workshop on 'Current Industrial Problems and Workplace Stress Management (November 1, 2013)

**Department of Mechanical Engineering:**

- Power Plant Engineering for CESC Engineers (one week)

**Department of Mining Engineering:**

- Land Acquisition and Environmental Clearance of Projects (5 day)
- Risk Assessment and Accident Prevention in Mines (November 5-8)

**Materials Science Centre:**

- Materials Engineering & Industrial Applications: Hybrid Nanocomposites for Photonics, Energy & Electronic Devices (November 11-22, 2013)
- Materials for Advanced Applications (Sept 2-13, 2013)
- Materials for Advanced Applications (2 weeks)

**Department of Ocean Engineering & Naval Architecture:**

- In-house Training Programme on Practical Ship-building (Mar. 03-14, 2014)
- Integrated Coastal Zone Management with Gujarat perspective (20-27 February, 2014)

**Reliability Engineering Centre:**



- Reliability Modeling of Sensors Network System for Critical Applications IV (December 09-14, 2013)

**Vinod Gupta School of Management:**

- 6-day Supervisory Development Programme for L&T Construction (6 Days)
- MDP for E2 & E3 Level Executives of UCIL (Two days)
- Supervisory Training workshop for L & T (One week)

**Rajendra Mishra School of Engineering Entrepreneurship:**

- Big data analytics (Two weeks , Summer 2014)

**CONTINUING EDUCATION PROGRAMME**

The Continuing Education Programme is a significant academic activity of the Institute. Over the years, it has diversified in terms of coverage of disciplines, duration and level of the programmes and industries served. The activities includes providing continuing education and training to professionals from industries, large and small, providing opportunities to teachers of Engineering Colleges to update their knowledge through short term courses and for pursuing MTech and PhD programme under QIP. Also, CEP promotes teaching-learning resource materials in the form of printed texts, CDs and computer aided instruction packages etc.

During 2013-2014 the Continuing Education Centre organised seven QIP short term courses with 210 participants while the number of self-sponsored short term courses conducted was 60 with as many as 1600 participants. Also, in this period 18 conferences/workshops were conducted with 800 participants. The centre also coordinates 3 year MTech programmes for AICTE approved college teachers and industry professionals in which, during the past four years,

190 college teachers and professionals joined the departments of Electrical Engineering, Electronics and Electrical Communication, and Information and Communication Technology. The three year executive MBA programme organised by the unit had 25 and 4 students in its Kolkata and Bhubaneswar centres respectively. During this year seven QIP scholars were awarded PhD degrees.

Under the scheme for empowerment of students and teachers through synchronous and asynchronous instruction (EIT) under NMEICT, MHRD, more than 600 faculty coordinators and 24000 engineering college teachers were trained.

Indian Institute of Technology Kharagpur started its first **International Summer and winter Term (ISwT)** in May 2014, where the national and international participants will get an opportunity to seek knowledge and experience from reputed International faculty through intensive study of subjects and personal interactions. Nineteen subjects were offered during the summer term (May-July) and 10 subjects will be offered during the winter term (December). These subjects are designed around current and multidisciplinary themes of Science, Engineering, Management and Law. The duration for each subject is of 2 weeks or 10 working days with a judicious blend of lectures and tutorials/practicals per day.

Recent facilities of the Centre include Video-Conferencing Studios for use as on-line classrooms at Kharagpur (5), Kolkata (3), Bhubaneswar (3) and Raipur (2) with seating capacity of 280, 140, 130 and 100 respectively.

## **HIGHLIGHTS OF ACHIEVEMENT DURING THE PAST YEAR**

Some of the outstanding achievements over the past year are as follows:

- Initiation of Schools and Centres: Four new Schools which were initiated during the past year include (a) School of Energy Science; (b) School of Environmental Science and Engineering; (c) School of Nanoscience and Technology, and (d) School of Biosciences.
- Creation of Dr. B. C. Roy Institute of Medical Science and Research: This institute is going to have: 1) 750 Bed Super- speciality Hospital, 2) Technology-enabled Medicine Teaching Clinic, 3) Bio-medical Innovation Centre, 4) Healthcare Outreach Centre and 5) Paramedic Training College.
- Research initiatives and collaborative research programmes started: These initiatives and advanced research laboratories include the following: P. K. Sinha Centre for Bio-Energy, Tea Engineering Research Centre, Centre of Excellence in Information Assurance, Research Laboratory in Electronics Controls and Software, Nano & Microfluidics Research Laboratory, Communication Empowerment Laboratory, Micro- Electronics & MEMS Laboratory etc.
- Innovative and socially relevant funded research activities: The Institute is funding seventeen innovative and socially relevant research projects in the areas of railway research, nanosensors, deep excavation, polymeric composite membranes, microbial fuel cells, expert system for blast furnaces, catalytic hydrolysis, sustainable waste water treatment, fast fixed point algorithms etc.
- International Summer and Winter Term: Indian Institute of Technology Kharagpur started its first international summer and winter term (ISWT) where participants got an opportunity to seek knowledge and experience from reputed international faculty through intensive study of subjects and personal interactions.
- Alumni grant: Shri. Gopla Rajagarhia International Programmes has been initiated under which Rs. 10 crore has been pledged of which Rs. 3.6 crore has been received so far.

## **LAURELS AND DISTINCTIONS AWARDED TO FACULTY**

Every year, the teachers and students of IIT Kharagpur receive a number of awards and honours, laurels and distinctions in recognition to their excellence. This year, too, faculty members have been honoured with prestigious awards and elected as Fellows of the National Science and Engineering Academies. The students have also been rewarded with various scholarships and their contributions have been recognized for their stellar performance in various conferences, symposia etc. The details of the achievements follow:

### **Shanti Swarup Bhatnagar Award**

Dr. Suman Chakraborty (ME) was honoured with the prestigious Shanti Swarup Bhatnagar Award for 2013, by the Council for Scientific and Industrial Research (CSIR), New Delhi, recognizing his achievement in the field of Engineering Sciences

### **Fellowships**

Dr. Kamleshm Narayan Tiwari (Ag&FE): Elected as a Fellow of the the National Academy of Sciences, India, Allahabad. He is also elected as a Fellow of the Indian Society of Agricultural Engineers, New Delhi.

Dr. Sudhindra Nath Panda (Ag&FE): Elected as a Fellow of the National Academy of Agricultural Sciences, New Delhi

Dr. Pratim Kumar Chattaraj (CY) : Elected as a Fellow of The World Academy of Sciences (TWAS), Trieste, Italy in recognition to his outstanding contributions on Chemical Sciences

Dr. Partha Pratim Chakrabarti (CSE) and Director: Awarded the J. C. Bose National Fellowship, by the Ministry of Science and Technology, Government of India, in recognition of his outstanding performance and contribution to Science

Dr. Sankar Kumar Nath (G&G): Elected as a Fellow of the Indian Geophysical Union (IGU), Hyderabad

Dr. Subhasish Tripathy (G&G) (currently on lien to the School of Earth, Ocean and Climate Sciences, IIT Bhubaneswar): Elected as a Fellow of The National Academy of Sciences, India, Allahabad. Also elected as a Fellow of the Indian Geophysical Union, Hyderabad

Dr. Prasanta Kumar Das (ME): Elected as a Fellow of The National Academy of Sciences, India, Allahabad

Dr. V. N. Achutha Naikan (REC): Elected as a Fellow by The Institution of Engineers (India), Kolkata

Dr. Mahitosh Mandal (SMST): Elected as a Fellow of the West Bengal Academy of Science and Technology for his notable contributions in the field of Cancer Biology

#### **Awards**

Dr. Madan Kumar Jha (Ag&FE): Awarded an “Outstanding Book Award” for the year 2013, by the Indian Society of Agricultural Engineers, New Delhi, for his book entitled “Hydrologic Time Series Analysis : Theory and Practice”, published by Springer

Dr. Rintu Banerjee (Ag&FE): Selected as one of the most inspiring Women Engineers/ Scientists for the year 2014, by the Engineering Watch. Also selected for the “Rafi Ahmed Kidwai Award for Outstanding Research in Agricultural Sciences-2013” by Indian Council of Agricultural Research, New Delhi

Dr. Satyahari Dey (BT): Received the Dr. Jagadish Chandra Bose Hindi Granth Lekhan Puraskar, awarded by the Department Biotechnology, Government of India, New Delhi, for Biotechnology Glossary in Hindi, published by Dunwoody Press, USA. Also elected as the Deputy Secretary General in Asian Federation of Biotechnology

Dr. Sirshendu De (ChE): Received the NASI-Reliance Industries Platinum Jubilee Award (2013), by The National Academy of Sciences India, Allahabad, for his contribution in application oriented innovations

Dr. Rabibrata Mukherjee (ChE): Selected for the prestigious MRSI Medal for 2014 by the Materials Research Society of India, Bangalore

Dr. Amit Basak (CY): Selected for the Chemical Research Society of India (CRSI) silver medal

Dr. Swagata Dasgupta (CY): Selected as one of the most inspiring Women Engineers/ Scientists for the year 2014, by the Engineering Watch

Dr. Modhu Sudan Maji (CY): Selected for the Innovation in Science Pursuit for Inspired Research (INSPIRE) Faculty Award by the Ministry of Science and Technology, Government of India, New Delhi

Dr. Subhasish Dey (CE): Being within the top 100 authors worldwide in Civil Engineering (75th position)

Dr. Animesh Mukherjee (CSE): Selected as ICTP Associate (Simons Associate), supported by funds from the Simons Foundation, Italy. Also selected for the INSA Young Scientist Medal 2014 awarded by the Indian National Science Academy, New Delhi, for his significant contributions in language dynamics in cognition and perception

Dr. Arindam Basu (G&G): Selected for the “GSI Sesquicentennial Commemorative Award” for the year 2013 in the field of Engineering Geology by the Council of the Geological Society of India, Bangalore

Dr. Rabindra Kumar Pradhan (HSS): Selected for the “Best Teacher Award-2013”, by the Indian Society for Training and Development (ISTD), New Delhi, for his outstanding contribution in the field of HR Training and Development

Dr. Gourishankar S. Hiremath (HSS): Selected for Prof. M. J. Manohar Rao Young Research Award for the year 2013 by The Indian Econometric Society

Dr. Manoj Kumar Tiwari (ISE): Considered as the Number One author from among the top hundred authors in the *International Journal of Production Research*, published by Taylor and Francis, UK

Dr. Jagadis Chandra Misra (MA) Former Professor: Selected for the Outstanding Teachers Award-2013 by the Indian National Academy of Engineering, New Delhi

Dr. Souvik Bhattacharyya (ME): Selected for the Outstanding Teachers Award-2013 by the Indian National Academy of Engineering, New Delhi

Dr. Prasanta Kumar Das (ME): Accredited as recognized expert in the field of Advanced Heat Exchangers (Multistream), by the European Process Intensification Centre (EUROPIC)

Dr. Suman Chakraborty (ME): Selected as INAE Chair Professor for a period of two years (from June 01, 2014 to May 30, 2016), by the Indian National Academy of Engineering, New Delhi

Dr. Indranil Manna (MME) (currently on lien as Director, Indian Institute of Technology Kanpur): Awarded with the TWAS Prize 2013, by The World Academy of Sciences (TWAS), Trieste, Italy, in recognition to his outstanding contributions in establishing microstructure- property correlations to nanometric materials

Dr. Jyotsna Dutta Majumdar (MME) : Recipient of the “Friedrich Wilhelm Bessel Award” by the Alexander von Humboldt Foundation, in recognition of her past accomplishments in research and teaching

Dr. Ing. M. A. Ramlu (MinE) Former Professor: Recipient of the MEAI - Lifetime Achievement Award 2011, presented by the Mining Engineers’ Association of India, for his outstanding contribution to Mining Engineering Education and the Industry, besides significant contribution to Mining Engineers’ Association of India during his lifetime

Dr. Subir Kr. Mukhopadhyay (MinE): Selected for the Distinguished Alumnus Award-2014, by the Department of Mining Engineering, Indian Institute of Technology (Banaras Hindu University), Varanasi

Dr. Khanindra Pathak (MinE): Selected for the “Life Time Achievement Award”, by the Indian Mining and Engineering Journal, for his life time contribution in the field of Mining Engineering Education, Research and Innovation

Dr. Debarati Sen (GSSST): Honoured with the “IETE-N V Gadadhar Memorial Award (2013)”, awarded by the Institution of Electronics and Telecommunication Engineers, New Delhi, in recognition of her outstanding contributions in design and development of a bandwidth and energy efficient sub-band based radio technology for wideband communication

Dr. Mahitosh Mandal (SMST): Awarded Shuva Mukherjee Memorial Award (2012), by The Physiological Society of India, Kolkata, in recognition to his outstanding contributions in Cancer Research

Dr. Chandan Chakraborty (SMST): Selected for the DAE-Young Scientist Research Award 2013, by the Department of Atomic Energy, Government of India

### **Membership of Editorial Boards**

Dr. Tanmaya Pathak (CY): Invited to join the Editorial Board of Biochemical Compounds, an open access journal, published by Herbert Publications Limited, UK

Dr. Sudhir Kumar Barai (CE): Invited to serve as an Associate Editor on the Editorial Board of Sadhana, proceedings of Indian Academy of Sciences, Bangalore, in engineering sciences

Dr. Anjali Pal (CE): Considered as a Regional Editor of the journal Recent Patents on Nanotechnology, published by Bentham Science Publishers

Dr. Rajib Maity (CE): Invited to serve as an Associate Editor on the Editorial Board of the ISH Journal of Hydraulic Engineering, published by Taylor and Francis. Also invited to the Editorial Board as an Associate Editor, for the international journal Journal of Earth System Science, published by Springer (Indian Academy of Sciences, Bangalore)

Dr. Partha Pratim Das (CSE): Invited by the Institution of Engineers (India), Kolkata, to be the Editor-in-Chief of the Journal of the Institution of Engineers (India) : Series B

Dr. Abhijit Mukherjee (G&G): Invited to be an Associate Editor for the journal Frontiers in Environmental Science : Water Resources Quality, published jointly by Nature Publishing Group and Frontiers, Switzerland

Dr. Soumitra Paul (ME): Invited to be a Member of the Editorial Board of Sadhana, published by Springer, on behalf of Indian Academy of Sciences. Also invited to serve as an Associate Editor on the Editorial Board of Sadhana, proceedings of Indian Academy of Sciences, Bangalore, in engineering sciences

Dr. Suman Chakraborty (ME): Invited to serve as an Editorial Board Member for Scientific Reports, a journal from Nature Publishing Group

Dr. Dilip Kumar Pratihari (ME): Appointed as an Associate Editor of International Journal of Computer Information Systems and Industrial Management Applications (IJCISIM), published by Machine Intelligence Research (MIR) Lab

Dr. Tapas Kr. Bandyopadhyay (MME): Invited to serve as an Editorial Board Member of the journal Recent Patents on Nanotechnology, published by Bentham Science Publishers

Dr. Debabrata Sen (OE&NA): Invited by the Editor-in-Chief, J. Ocean Engineering and Marine Energy, Springer, to become an Associate Editor of a new journal.

Dr. Samit Kumar Ray (PH): Invited to serve on the Associate Editorial Board of Frontiers in Optics and Minerals, a section of Frontiers in Materials

Dr. Amreesh Chandra (PH): Invited to serve as an Editorial Board Member for Scientific Reports, a journal from Nature Publishing Group, the publishers of Nature

Dr. Subhasish Basu Majumder (MS): Invited to serve as an Editorial Board Member for Scientific Reports, a journal published by the Nature Publishing Group

## **ACHIEVEMENTS BY THE STUDENTS**

### **Laurels**

Dr. Pijus Kundu, Ex-Research Student 08AT9703: Innovative Student Projects Award 2013 by ITER, Siksha 'O' Anusandhan University, Bhubaneswar

Dr. Chandan Karfa, Ex-Research Student, 08CS9702: Innovative Student Projects Award 2013 by ITER, Siksha 'O' Anusandhan University, Bhubaneswar

Ms. Shahab Fatima, Research Student, 10RE90R02: International Student Travel Award by 20th International Congress on Sound and Vibration (ICSV20), Bangkok

Ms. Sangita Singh, Research Student, 11RT91P01: Best Presentation (Oral) Award at International Elastomer Conference by Rubber Division of American Chemical Society (ACS), Cleveland, Ohio, US

Shri Divij Sharma, MBA Student Vinod Gupta School of Management, 12BM60046: First prize in TCS Smart Manager Case Study Contest conducted by Tata Consultancy Services across B-schools in India & abroad

Shri Sourav Kumar Bagchi, Research Student, 11AG92P04: Best Poster Award by the National Conference on "Frontiers in Algology and Algal Biotechnology", Visva-Bharati, Santiniketan

Shri. Rupam Biswas, Research Student, 11BT92F07: 'Professor Kailasam Venkatesan Award' by the Indian Crystallographic Association for the Best Oral Presentation, 2013

Ms. Anuja Das, MTech student: Late Lakshmi Nandakumar Award of IChE for Best Paper Presentation at SCHEMCON-2013

Shri Partha Laskar, Research Scholar, 10CY90P01: Best Poster Award at the 5th Asian Conference on Colloid and Interface Science organised by Asian Society for Colloid and Surface Science at North Bengal University.

Ms. Nagalaxmi, MTech student, First Prize for Oral Presentation in the 67th Annual Technical Meeting of the Indian Institute of Metals

Shri. Manab Mallik, Research Scholar: Second Prize for Oral Presentation in the 67th Annual Technical Meeting of the Indian Institute of Metals

Ms. Nitika Gupta, Research Scholar: Young Scientist Award for the Best Technical Presentation by the Central University of Odisha, Koraput.

Shri Bharat Reddy Kunduru, Mr. Arun Kumar Kota and Mr. Bhargava Gorthy, MBA Students, Vinod Gupta School of Management: First Prize in Finance Flagship Event 'Prometheus' of Ensemble 13 - The annual international management conclave of XLRI, Jamshedpur

IIT Kharagpur team comprising Kausik Basak, Debdoot Sheet, Phani Krihna Karri of SMST

And Tomaghna Ojha of SIT won GE Edison Challenge 2013 with cash prize of Rs. 10 Lakhs

Shri Rajiv Chandra Rajak, Research Scholar, 12AT91F03: Best Poster Award at Asian Congress on Biotechnology-2013 at India Habitat Centre, New Delhi

Shri Srikanth Madala, Research Scholar, 11CL91R02: 'Gold Medal for the Best Poster Presentation at the International Tropical Meteorology Symposium (INTROMET-2014)

Shri Abhishek Dwivedi, MHRM student: Ranked 1st in the City Round and also in the State Round in the Campus2Corporate Contest, 2013

Ms. Priyanka Dasgupta, MHRM student: Ranked 2nd in the City Round and also in the State Round in the Campus2Corporate Contest, 2013

Shri S. Abhilash (UG 1st Yr.), Shri Subham Vidyant (UG 1st Yr.), Ms. Priyanka Dasgupta (MHRM 1st Yr.), Shri Chetan Pandey (MHRM 1st Yr.): Won prizes for their exemplary entries in the All India Essay Event organised by the Shri Ram Chandra Mission

Shri Gaurav Jain, BTech student, 12MT10013: Governor's Medal at Governor's House for exceptional achievements and contribution as Cadet of 3 Bengal Tech Air Squadron NCC

Shri Narendra Gogurla, Research Scholar, 12PH90J01: Nanoscale Poster Prize, awarded by Royal Society of Chemistry for paper presentation at the International Conference on Nano Science and Technology, Chandigarh

Ms. Akriti Kapoor, Ms. Preeti Kareddy and Shri C. Paresh Ravindra, Second year students of LLB: First Position in 6th B. Krishna National Intellectual Property Rights Moot Court Competition, 2014 organised by Symbiosis Law School, Pune

Shri Bikas Kumar Arya, Ex-Research Scholar, SMST, 09MM6003: Won "Robert Austrian Award" in Pneumococcal Vaccinology carrying a grant of \$25,000

Shri Ranabir Dey, Research Scholar, 10ME90R24: Gandhian Young Technological Innovation Award/Appreciation 2014

Shri Shantimoy Kar, Research Scholar, 12AT91F01: Gandhian Young Technological Innovation Award/Appreciation 2014

Shri Pijus Kundu, Ex-Research Scholar: Gandhian Young Technological Innovation (GYTI) Awards - 2014 with Technological Edge(TE) Award

Ms. Raka Mukherjee, Research Scholar, 12CH91R05: Gandhian Young Technological Innovation Award/ Appreciation 2014

Shri Aliba Ao, Research Scholar, 10GG90F01: Awarded the Certificate for Best Oral Presentation at the International Seminar on Magmatism, Tectonism and Mineralization at Kumaun University, Nainital, Uttarakhand,

Shri Arijit Sarkar, MTech student, 12PH62R05: Received 2nd best SPIE Student award of US\$200 at International Conference on Optics and Optoelectronics (ICOI-2014) , Dehradun

Shri Narendar G., Research Scholar, 12PH90J01: Awarded the “Excellent Paper Presentation Award” at International Conference on Optics and Optoelectronics (ICOL 2014), Dheradun

Shri Vishwatosh Mishra, Research Scholar, 12PH92F05: Awarded the “Excellent Paper Presentation Award” at International Conference on Optics and Optoelectronics (ICOL 2014), Dheradun

Shri Rao Rutwik Kishan, Shri Kamat Vighnesh Satish and Shri Bibhunanda Mishra, 2nd Year LLB students Rajiv Gandhi School of Intellectual Property Law: Runner-up position in the prestigious Oxford University India Moot Court Competition (2013 – 14) organised by Oxford, Delhi

Shri Amritanshu Anand, Department of Geology & Geophysics and Shri Anshul Singhle, Department Computer Science & Engineering: Won the Mercury Fund Investment Prize. The team also received several financial commitments totaling over \$1 million at the Rice Business Plan Competition (RPBC)

### **Scholarships**

Shri Soumen Kar, Research Scholar, 10CR90R02: IEEE CSC Student Fellowship award

Dr. Bikas Kumar Arya, Research Scholar, 12MM91P03: Fulbright Scholarship 2014

Ms Riya Bubna, BTech student, 13CS10041: Aditya Birla Scholarship

Shri Santanu Pradhan, Research Scholar, 10PH90R05: Bhaskara Advanced Solar Energy (BASE) Fellowship

Ms. Sneha Rani, Research Scholar, 11MI91R01: Selected for IEAGHG International Interdisciplinary CCS Summer School, University of Texas at Austin, TX, USA

Ms. S. Fatima, Research Scholar, 10RE90R02: Schlumberger Foundation Faculty for the Future Scholarship for the year 2014

### **HEALTH CARE**

#### **B. C. Roy Technology Hospital (BCRTH)**

IIT Kharagpur provides primary health care and round the clock emergency services to the campus community through B C Roy Technology Hospital, which is a 32 bedded (including ICU and Isolation Wards) hospital located strategically within the campus. Approximately 7000 patients attend the Out Patient Department at B C Roy Technology Hospital every month. Constant efforts are on to upgrade and improve the existing facilities at the B. C. Roy Hospital. Health Care remains a top priority in the activities of the Institute. The hospital and its services are fully utilised by students and other institute beneficiaries. A round the clock pharmacy has been made available within the hospital. Medical Insurance coverage through the Institute is available for the students.

B C Roy Technology Hospital has a Pathology and Microbiology lab, and a Radiology unit. It has many modern diagnostic equipment such as Computerized Radiology Unit, Ultrasonography with Colour Doppler, Fully Automatic Biochemical analyzer, Telemedicine, Video Slit Lamp and Auto-Refractometer. In addition to General OPD service, special clinics are provided in General Medicine, Cardiology, Paediatrics, Chest, Skin, Psychiatry, General Surgery, Obstetrics & Gynaecology, Orthopaedics, Eye, ENT and Dental by appointing visiting consultants in the various disciplines. Immunization clinics are operated with the help of Consultant in Public Health and Paediatrician.

A Hospital Management Committee, comprising of representatives from all stake holders of the Institute and headed by Professor- In-Charge, B C Roy Technology Hospital as the Chairperson,



meets regularly to overview the functioning of the hospital, listen to the grievances and suggest to the authority regarding all round development of the hospital and its services.

The following are some of the most recent major achievements at and by B C Roy Technology Hospital in 2013:

1. The procedure for referring patients to higher medical care centres is continuously examined and MOUs are drawn with suitable Corporate Hospitals in Kolkata, e.g. R N Tagore International Institute of Cardiac Sciences, Ruby General Hospital, Kothari Medical Centre. In 2013, visits to reputed Super specialty Hospitals in Kolkata were organised by B C Roy Technology Hospital for the campus community representatives. Subsequently, MOUs have been drawn between IIT Kharagpur and the recommended reputed Super specialty Hospitals in Kolkata, such as B M Birla Heart Research Centre, Medica Superspecialty, and Fortis Hospital.
2. A 120 kV Generator Set has been installed to ensure uninterrupted power supply to the B C Roy Technology Hospital.
3. The OPD Registration Counter at B C Roy Technology Hospital has been upgraded and relocated in the interest of better service to the community.
4. A new Operation Theater with all required equipments has been added to B C Roy Technology Hospital.
5. Air Conditioners have been installed in all the Indoor Wards to provide additional comfort to the patients.
6. A new USG Machine with Colour Doppler has been installed.
7. A proposal for installing a Bed Lift, to carry patients with the bed, was initiated and the work has started.
8. To improve the OPD service and to cater to the needs of the community, a number of visiting consultants in specialised fields such as Cardiology, General Surgery, Orthopedics, have been appointed. Advertisements for visiting consultants in other areas, such as Gynecology, have been sent out.
9. For community health care promotion, support from B C Roy Technology Hospital to NCC, NSS and other socially active units were extended for conducting Health Check up Camps and Blood Donation Camps in the Institute.
10. As part of Preventive Health Care initiative for campus community, B.C Roy Technology Hospital arranged special clinics, such as Bone Mineral Density Screening Clinic, Diabetes clinic.
11. As part of Public Health measures, regular immunization clinics have been organised with the help of Consultant in Public Health and Pediatrician.
12. Also, Halls of residence were regularly visited by a Public Health Consultant with special attention to cleanliness, and sanitation.

#### **ALUMNI AFFAIRS**

The alumni contribute significantly towards upholding the name of the Institute and the country. They also contribute substantially to the evolution of their Alma Mater. The Institute is thankful to its alumni for the bountiful support it receives from them. It strives to maintain a close bond and share

various current events and policies with alumni. The Office of the Dean, Alumni Affairs & International Relations (AA&IR), the Institutional Development (ID) Programme Team and the Students Alumni Cell strive to create a platform for organizing the alumni interactions, relations and activities such as branding and fundraising. Some of the activities undertaken during 2013-14 are given below.

**Interactions with National and Global Alumni:** The institute sent a delegation to the PAN IIT Meet at Houston, Texas, organised by the PAN IIT Alumni of USA. During and after the meet several interaction meetings with alumni took place at Houston, Washington DC and New York City. Back home meetings have been held between the Director and the Alumni chapters at Kolkata and also at Bangalore. Representatives of the Alumni Chapters from Delhi, Kolkata, Hyderabad, Chennai etc. also visited the institute during the Alumni Meet.

**Student-Alumni Regional Meets:** Regional Student-Alumni Chapter Meets were organised in Delhi in December 2013 and in Bangalore in June 2014 which witnessed excellent participation of students as well as alumni. These regional Chapter meets are conducted to foster student-alumni interaction and provide a gateway for the alumni community to connect to their Alma Mater.

**Annual Alumni Meet at IIT Kharagpur:** The 11<sup>th</sup> Annual Alumni Meet was organised during January 17 - 19, 2014 with high tempo both from the Institute and the visiting alumni. The special batches invited were those belonging to 1964, 1974 and 1989. This year saw a significant increase of about 50% in the number of visiting alumni. A total of 221 alumni including 52 family members were part of this reunion. The batches relived their golden days of college life with batch mates. They also experienced the growth of the Institute and interacted with present faculty members, students, and staff. The Students Alumni Cell received all round appreciation from the alumni for their excellent efforts and cordial behavior during the meet. Alumni ID cards were given away to several alumni.

**Foundation Day:** The 62<sup>nd</sup> Foundation Day was celebrated on August 18, 2013. The office coordinated the organization of the Foundation Day on behalf of the Institute. Mr. Amit Chatterjee of 1984 batch, General Manager at Microsoft India and a Distinguished Alumnus was the chief guest for the occasion. Faculty and staff members who completed 25 years of service were felicitated by the Director. The Nina Saxena Excellence in Technology Award was handed over to the recipients. Later that day, a debate, football competition and entertainment programme were organised by the students.

**Awards:** Like every year the Distinguished Alumnus Award is to be given away by the Institute to the alumni during the Annual Convocation 2014. Fourteen distinguished alumni have been selected for the award in the current year. The IIT Kharagpur Alumni Association USA has indicated that it wishes to recognize Faculty and Student Excellence at the institute through several new awards funded individually and collectively by the US alumni. The Institute is currently in the process of setting up the norms and criteria for these awards to be given away in the years to come.

**Guest Lectures:** Several alumni were invited for giving lectures this year: Mr. Arjun Malhotra (EC/1970), DSc (*Honoris Causa*) of the Institute shared the challenges in his early entrepreneurial endeavors. Being the Chairman of IIT KGP Vision 2020, Mr. Malhotra also briefed the audience about various aspects of the programme. Mr. Vinod Gupta (AG/1967), Distinguished Alumnus, vividly shared his experiences about how IIT Kharagpur has shaped him in life. He urged the students; never to forget what IIT Kharagpur has done for their life. Mr. Rajeev Agarwal (ME/1986), Founder and CEO, MAQ Software explained his transition from IIT Kharagpur to the outside world after graduation and what difficulties he faced during his constant quest for knowledge and fulfillment. Prof. Farrokh Mistree, Distinguished Alumnus along with his wife and colleague, Prof. Janet Allen inspired the students to take up an academic career.

**Leadership Summit:** A Leadership Summit was organised on 10<sup>th</sup> November, 2013 for the students to draw inspiration from the alumni who have made it large in their lives. This year the following alumni were invited viz. Mr. Ashok Khemka (CS/1988), DG, Archives and Archaeology, Haryana; Mr. Arunabh Kumar (EE/2006), Founder and CEO, The Viral Fever; Mr. S.V Mani (EE/1974), Vice President, Tata Consultancy Services; Mr. Peshwa Acharya (CH/1989), CEO, Aasaanpay Solutions India Pvt. Ltd; Mr. Subrata Paul (ME/1974), CEO & Director, Bengal Aerotropolis Project Ltd and Mr. Tulsidas Banerjee (ME/1979), Vice President and Head-Strategy, TIL LTD Kolkata. The event received a very positive response from the students.

**Mentorship Programme:** Launched in 2010-2011 with only a limited number of mentors this has now grown into a full-fledged affair with around 330 alumni and 780 enthusiastic students. Under this programme the esteemed alumni of our Institute provide guidance to the students on various professional and extra-professional matters to prepare them well before they step into the real world. The great success of this programme holds testimony to its effectiveness.

**My Imprint Programme:** This is a programme ‘By the Students, For the Students’ where, the outgoing students pledge their support towards the Institute initially by donating their caution money towards students’ services. Last year around 274 outgoing students from the Class of 2013 contributed towards this cause. A portion of this money was utilised in funding international travel of talented students so that they could participate in various international competitions such as Hult Prize, GRIFTECH, TEAMKART Formula, Intelligent Ground Vehicle Competition, FIRA World Cup. This year the concept of a Class Gift has been introduced in which part of the outgoing students’ donation shall be used towards a unique gift that the batch decides to make towards the future generation of students. This year the donating students have opted for “Financial Support for International Travel” as “Class Gift from Class of 2013”. The rest of the money collected remains with the endowment fund of IIT-KGP.

**Founding Batch Endowment Campaign:** This is one of the various fund raising campaigns, initiated aiming to bring together alumni from individual batches and motivate them to donate collectively in the name of their batch. Each batch has a minimum target of INR 50 lakhs. Once it is achieved, the batch is honoured by naming a classroom after them in the Nalanda Academic Complex. Till now 5(five) batches have already succeeded. A classroom endowed in the name of 1991 batch has already been unveiled on December 10, 2012. Nineteen sixty-eight batch is the next one to receive it this year. An amount of Rs. 2.23 crore was generated through various fund raising campaigns in FY 2013-14.

**Shri Gopal Rajgarhia International Programmes:** This is a unique programme launched this year by IIT Kharagpur and facilitated by our alumnus Shri Gopal Rajagarhia of 1968 batch with a seed fund of 3.6 crore endowment funding which will offer assistance to students and scholars who can exhibit their excellence on various international platforms. It also encourages talented scholars to conduct research at IIT Kharagpur thereby boosting exchange programmes and research activities and helps the Institute to make its presence felt strongly across international academia which is correlated with the ranking of the Institute. Thus the programme is a significant step towards achieving the Vision 2020 programme of IIT Kharagpur to improve its global stature. It has few sub-programmes viz: SGR International Faculty Outreach Programme, SGR International Research Scholar Support Programme, SGR Student International Travel Programme, SGR International Student Scholarship and Internship Programme. The total money pledged for the above programmes is 10 crore from Shri. Gopal Rajgarhia.

**Brand Building:** An effective mass mailing system to update our alumni, students, faculty members, retired faculty members and parents regularly about the Institute news and progress is maintained. Seasonal Greetings and various fund-raising campaign updates were also sent via mass mails.

Through various public relation activities, regular communication, social media and ranking data submission, the Institute has started taking small steps towards the big goal of Vision 2020 thus enhancing the IIT-KGP brand both internationally and domestically. Recently the ID team worked in close coordination with students and faculty members and developed a new website for JEE-Advanced Qualifiers to attract higher JEE rank holders to study at IIT Kharagpur. The connectivity of the Institute with individual alumni also improved from 23000 to 33000 during this year.

**Publications:** Like every year, the print publications including *KGPian* – quarterly newsletter, Alumni Annual Report and the Annual souvenir *Yearnings of Yore* have been published during Alumni Meet. *KGP Connection*, a fortnightly e-newsletter is in regular circulation. Additionally brochures for different campaigns, Foundation Day Celebrations, Alumni ID Cards, separate Yearbooks for UG, PG and PhD students were also published.

**Hall of Fame:** The institute wishes to develop a Hall of Fame to preserve its history and achievements. It is planned that this work would be undertaken in two phases and in the first phase the Office of Alumni Affairs and the ID programme would be modernized. Fund raising shall be undertaken to realise the necessary funds. An amount of INR 50 lakhs has been pledged towards this cause by Prof. Tapan Prasad Bagchi, an ex- Professor and an alumnus of the institute, of which about Rs. 27 Lakhs has already been donated.

## **CAREER DEVELOPMENT CENTRE**

The Career Development Centre (formerly known as Training and Placement Office) is responsible for arranging practical training for 3rd year BTech / Dual Degree and 4th year MSc degree students and job placement of final year students graduating from the Institute. The Centre is actively engaged in forging synergistic relationships between the Institute and various industries and user systems of technical and scientific manpower. Based on these interactions, the CDC gives feedback to the Institute on the academic programmes.

### **Summer Training Details**

Eight weeks of summer practical training at the end of 3rd year BTech/ Dual Degree and 4th year MSc degree is a compulsory part of the curriculum at IIT Kharagpur, carrying 2 credits. All efforts are made to place the concerned students in the best of organizations in India and abroad for summer training through the Career Development Centre section and various departmental supports. An emergent trend is that more and more students are seeking summer training abroad.

A total of 1250 companies/organizations in India were contacted for training facilities for the current summer vacations in May-July 2014. Among these 78 in India had offered training facilities, out of which 48 organizations had extended out-of pocket allowances (covering 225 students) and many other extended facilities such as subsidized transport, subsidized canteen, subsidized accommodation and to- and fro travel expenses (e.g. 3AC fare, air fare etc.) for our students. The highest out of pocket allowance of Rs. 60,000/- per month was paid by ITC Ltd. and Hindustan Unilever. Some other organizations such as Times Internet and American Express offered Rs. 50,000/- per month, Amazon and Adobe offered Rs. 30,000/- per month, Yahoo, Qualcomm, and Microsoft offered Rs. 20,000/- per month. Fifteen companies offered stipends in the range of Rs. 10,000/- to 20,000/- per month. In addition to the above, some students arranged internship by themselves with good stipends.

Out of 1282 third/fourth year BTech / Dual Degree / MSc students, 86 students will be attending summer internship abroad in many Institutes/organizations likes EPFL, Switzerland, University of Warwick, National University of Singapore, University of Tokyo, Max Plank Institute for Software Systems, Germany University of Alberta, Biotechnology & Bio Chemical Engineering, Belgium,

Rhinewall University, Germany Bremen University Dong A University, Busan , etc. and foreign companies like Finisar, Malaysia, Mitsubishi, Works Application, Japan, during May- July, 2014.

### Placement Details

Two hundred and sixty companies/ organizations have considered our students for employment during 2013-2014. The details of number of students who had registered for placement and those actually placed through campus interviews including those who have opted either for higher studies or arranged job through off campus as on 30.06.2014 are as follows:

Course/Degree	No. of students registered	No. of students placed
BTech (Hons) & BArch	615	524
5-year Integrated MSc	138	113
2-year MSc	116	61
Dual Degree (BTech + MTech)	387	329
MTech / MCP	710	448
MBA	70	65
MS/PhD	20	20
Total	2056	1560

The Highest Overseas salary received in 2013-14 is \$125000 per annum and the second highest is \$100000 per annum.

The Highest salary received in INR is Rs. 36.9 Lakh per annum and the second highest is Rs.28.5 Lakh per annum in 2013-14.

Average Salary for 2013-14 is as follows.

Courses	Average Salary (CTC) Rs. Lakh per annum)
BTech & BArch	11.21
Dual Degree	11.37
5 yr. Integrated MSc	10.71
VGSOM ( MBA )	11.78
2 yr. MSc	6.6
M Tech	7.9
MS/ PhD	8.3
All UG and PG Courses	9.97

Some companies like ITC Ltd., Schlumberger, Hindustan Unilever, Qualcomm, Barclay's Capital, etc have offered pre-placement offers. The total number of Pre-Placement offers received is 113.

### Student Participation

Career Development Centre at IIT Kharagpur has taken an initiative to harness the students' management skills through a formal system during the placement season since 2005-2006. The system has progressed extremely well and from year 2010 onwards, the CDC has immensely benefitted from

students participating in placement process. The organizational skill of students has helped CDC to conduct 12-15 companies' placement interviews per day and round the clock. During the placement season students play an active role from contacting the companies to the final selection at campus by providing complete logistic support.

### **STUDENTS' AFFAIRS**

The development of all-round activities of the students of IIT Kharagpur centres around the Technology Students' Gymkhana which houses the following facilities, many of which have been added in the last few years:

- Modern Gymnasium
- Billiards
- Athletics Stadium
- Two Cricket Fields with two turf wickets with jogging track along with modern practice facilities in Tata Sports Complex
- Six Tennis Courts including four flood light Courts
- Three flood light Basketball (Cemented) Courts
- Three flood light Volleyball (Cemented) Courts
- Four wooden Indoor Badminton Courts
- Table Tennis room with four tables
- Yoga room
- Standard Swimming Pool
- One Squash court

The activities of the students of IIT Kharagpur are many and what follows is a brief summary of highlights.

#### **Inter-IIT Sports Meet**

The 49th Inter-IIT Sports Meet was organised at IIT Guwahati. The first phase of Sports Meet began with the Inter-IIT Aquatic Meet held from October 1st to 4th, 2013. IIT Kharagpur secured 2nd position in Swimming and 3rd in water polo. Extraordinary performance in swimming was given by Shreyash Mahajan, a final year UG student. Shreyash was declared as the individual champion. The second phase which included all other games, started from December 16th to 23rd 2013. The men's section, IIT Kharagpur secured in the third position in Badminton while in Basketball it fetched the first position, in Cricket the second position, in Football the third position; in Lawn Tennis the second position; in Squash the fourth position; in Table Tennis the third position, and in Volleyball the fourth position.

On the whole, in 49th Inter IIT Championship, IIT Kharagpur after six long years secured overall Third Position in men's section. In Women's Section, it secured the first position in Lawn Tennis; and the third in Badminton. "Mr. Inter IIT" position was secured by Nitish Balal of IIT Kharagpur.

#### **Out-station Participation**

Basketball Boys and Girls Team participated in IMG Reliance BFI Inter College Basketball League held at Kolkata and they secured the first position. IIT Kharagpur Boys Team Secured the first position and Girls Team secured the third position. The boy's basketball Team qualified and subsequently participated in National Inter College Basketball league held at New Delhi, which is the first national level participation in the history of IIT Kharagpur.

Besides, IIT students participated in various cricket, football and lawn tennis tournaments organised in different parts of the country.

### **Spring Fest 2014**

The 55th edition of Spring Fest, the annual social cultural fest of IIT Kharagpur, was held from 23rd-26th January 2014. Eminent bands like Agnee, Swarathma, Underground Authority, Salim-Sulaiman, and Pentagram performed here. Under International Carnival, performers from various countries like Chris Cheong, a magician and mentalist from Malaysia, Jack Glatzer, a violinist from Portugal, Benny Prasad, a well travelled musician, Murray Molloy, a sword swallower from Ireland, Almost Trio, a juggling duo from Hungary and Jonathan Kay, an Indo- Jazz saxophonist from Canada participated.

### **Kshitj 2014**

The Annual Tech Fest Kshitj 2014 was organised from 31 January to 3rd February 2014. The event occurred under the patronage of UNESCO, and is currently rated as Asia's biggest techno management fest with major state-of-the-art scientific events and certifications.

The Fest consisted of many workshops such as Investigative Journalism, IFC, Technophilia, etc, while Mega-shows included Pyrolerra, BMX, Skate Driving, Roller Skating, Stunt Mania and EDM. Exhibitions included Orbit-brain controlled helicopter, Face Android, Miniature Models, NAO Robots, etc., while events included Genesis, Quizzard, Conceptualize, Theories N Core, Robotix, Strategia, Tech4fun, and many others.

The Principal Guest lecturers during the event were:

- Dougal Jerram, British geologist/earth scientist, media presenter/contributor, and author.
- Nawazuddin Siddiqui, Critically Acclaimed Actor
- Shazia Ilmi, Journalist , ex-anchor at Star News
- Jonathan Forman, Scientific Advisor- OPCW (Nobel Peace Prize 2013)
- Rajiv Malhotra, Author, Multi Millionaire and Philanthropist
- Amitabha Ghosh, Chairman-Mars Rover Mission
- Roel Vertegaal, Pioneer in Human-Computer Interaction

### **Other Highlights**

Technology Students Gymkhana is active in launching many Students centric and participatory Cells in major Research and Development initiatives sponsored by the MHRD, Government of India. During the year 2013-14, a few modules along this line of action has been opened to cater to 'The Future of Cities' initiative, projects under the Technology Robotics Society and the 'Science-Heritage' initiative called 'SANDHI'.

Important partnerships or exchanges are in the offing. To name a few, Technology Students Gymkhana has developed a potential collaboration with the Cricket Association of Bengal (CAB) and the two associations look forward to organising non-profitable matches in IIT Kharagpur and also at the regional level to augment the spirit of 'sports' amongst the Youth; another event is that of Hockey organised by Central Reserve Police Force in association with TSG.

TSG also played a major initiative in mobilizing the youth spirit of the Campus by organizing the 'Reach out week', various adventure clubs and societies, and various spot based sports and arts activities like SPECTRA etc.

## **Courses of Study**

### **Aerospace Engineering**

- B.Tech.- Aerospace Engineering
- Dual Degree - Aerospace Engineering
- Dual Degree - Aerospace Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Aerospace Engineering

### **Agricultural and Food Engineering**

- B.Tech.- Agricultural & Food Engineering
- Dual Degree - Agricultural & Food Engineering/ Farm Machinery & Power
- Dual Degree - Agricultural & Food Engineering/Post Harvest Engineering
- Dual Degree - Agricultural & Food Engineering/Dairy & Food Engineering
- Dual Degree - Agricultural & Food Engineering/Food Process Engineering
- Dual Degree - Agricultural & Food Engineering/Aqua Cultural Engineering
- Dual Degree - Agricultural & Food Engineering/Agricultural Systems & Management
- Dual Degree - Agricultural & Food Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Farm Machinery and Power
- M. Tech. – Land and Water Resources Engineering
- M. Tech. – Food Process Engineering
- M. Tech. – Agricultural Biotechnology
- M. Tech. - Aquacultural Engineering
- M. Tech. - Agricultural Systems and Management

### **Architecture and Regional Planning**

- B.Arch.
- Master of City Planning

### **Biotechnology**

- B.Tech.- Biotechnology & Biochemical Engineering
- Dual Degree - Biotechnology & Biochemical Engineering
- Dual Degree - Biotechnology & Biochemical Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Biotechnology and Biochemical Engineering

### **Chemical Engineering**

- B.Tech.- Chemical Engineering
- Dual Degree - Chemical Engineering
- Dual Degree - Chemical Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Chemical Engineering

### **Chemistry**

- M.Sc. - Chemistry
- Joint M.Sc.- Ph.D. in Chemistry (with effect from 2009 admissions)

### **Civil Engineering**

- B.Tech.- Civil Engineering
- Dual Degree - Civil Engineering/ Hydraulic & Water Resources Engineering
- Dual Degree - Civil Engineering/ Transportation Engineering
- Dual Degree - Civil Engineering/ Geotechnical Engineering
- Dual Degree - Civil Engineering/ Structural Engineering



- Dual Degree - Civil Engineering/ Environmental Engineering & Management
- Dual Degree - Civil Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Hydraulic and Water Resources Engineering
- M. Tech. - Transportation Engineering
- M. Tech. - Environmental Engineering and Management
- M. Tech. - Geotechnical Engineering (Withdrawn due to less than 5 students admission)
- M. Tech. - Structural Engineering

#### **Computer Science and Engineering**

- B.Tech.- Computer Science & Engineering
- Dual Degree - Computer Science & Engineering
- Dual Degree - Computer Sc. & Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Computer Science and Engineering

#### **Centre for Educational Technology**

- M. Tech. - Media and Sound Engineering

#### **Centre for Oceans, Rivers, Atmosphere and Land Sciences**

- M. Tech. - Earth System Science and Technology

#### **Cryogenic Engineering**

- M. Tech. - Cryogenic Engineering

#### **Electrical Engineering**

- B.Tech.- Electrical Engineering
- B.Tech.- Instrumentation Engineering
- Dual Degree - Electrical Engineering/ Machine Drives & Power Electronics
- Dual Degree - Electrical Engineering/ Control System Engineering
- Dual Degree - Electrical Engineering/ Power System Engineering
- Dual Degree - Electrical Engineering/ Instrumentation Engineering
- Dual Degree - Instrumentation Engineering/ Control Systems Engineering
- Dual Degree - Electrical Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- Dual Degree - Instrumentation Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Machine Drives and Power Electronics
- M. Tech. - Control System Engineering
- M. Tech. - Power and Energy Systems
- M. Tech. - Instrumentation

#### **Electronics and Electrical Communication Engineering**

- B.Tech.- Electronics & Electrical Communication Engineering
- Dual Degree - Electronics & Elect. Comm. Engineering/ Fibre Optics and Lightwave Engineering
- Dual Degree - Electronics & Elect. Comm. Engineering/ Microelectronics & VLSI Design
- Dual Degree - Electronics & Elect. Comm. Engineering/ RF and Microwave Engg.
- Dual Degree - Electronics & Elect. Comm. Engineering/ Visual Information & Embedded

System

- Dual Degree - Electronics & Elect. Comm. Engineering/ Telecommunications System Engg.
- Dual Degree - Electronics & Elect. Comm. Engineering/ MBA/Engineering Entrepreneurship/Financial Engineering
- M. Tech. - Fibre Optics and Light wave Engineering (not offered in the session 2008-2009)
- M. Tech. - Microelectronics and VLSI Design
- M. Tech. - RF and Microwave Engineering
- M. Tech. - Telecommunication Systems Engineering
- M. Tech. - Visual Information and Embedded Systems Engineering

### **Geology and Geophysics**

- M.Sc. - Exploration Geophysics
- M.Sc. - Applied Geology
- Joint M.Sc.- Ph.D. in Geophysics (with effect from 2009 admissions)
- Joint M.Sc.- Ph.D. in Geology (with effect from 2009 admissions)
- M. Tech. - Exploration Geosciences
- M. Tech. - Computational Seismology (Withdrawn due to less than 5 students admission)

### **Humanities and Social Sciences**

- M.Sc. - Economics
- Master of Human Resource Management

### **Industrial and Systems Engineering**

- B.Tech.- Industrial Engineering
- Dual Degree - Industrial Engineering/ Industrial Engineering & Management
- Dual Degree – Quality Engineering Design and Manufacturing
- Dual Degree - Industrial Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Industrial Engineering and Management

### **Materials Science**

- M. Tech. - Materials Science and Engineering.

### **Mathematics**

- M.Sc. - Mathematics & Computing
- Joint M.Sc.- Ph.D. in Mathematics (with effect from 2009 admissions)
- M. Tech. - Computer Science and Data Processing

### **Mechanical Engineering**

- B.Tech.- Mechanical Engineering
- B.Tech.- Manufacturing Science & Engineering
- Dual Degree - Mechanical Engineering/ Manufacturing Science and Engineering
- Dual Degree - Mechanical Engineering/ Thermal Science and Engineering

- Dual Degree - Mechanical Engineering/ Mechanical Systems Design
- Dual Degree - Mechanical Engineering/ Mechanical Systems, Dynamics & Control
- Dual Degree - Manufacturing Science & Engineering/ Industrial Engineering & Management
- Dual Degree - Mechanical Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- Dual Degree - Manufacturing Science & Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Manufacturing Science and Engineering
- M. Tech. - Thermal Science and Engineering
- M. Tech. - Mechanical Systems Design

### **Metallurgical and Materials Engineering**

- B.Tech.- Metallurgical and Materials Engineering
- Dual Degree - Metallurgical & Materials Engineering
- Dual Degree - Metallurgical & Materials Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Metallurgical and Materials Engineering
- Master of Steel Technology

### **Mining Engineering**

- B.Tech.- Mining Engg.
- Dual Degree - Mining Engineering/ Mining Engineering
- Dual Degree - Mining Engineering/ Safety Engineering and Disaster Management
- Dual Degree - Mining Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Mining Engineering

### **Ocean Engineering and Naval Architecture**

- B.Tech.- Ocean Engineering and Naval Architecture
- Dual Degree - Ocean Engineering & Naval Architecture
- Dual Degree - Ocean Engineering & Naval Architecture/MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Ocean Engineering and Naval Architecture

### **Physics and Meteorology**

- M.Sc. - Physics
- Joint M.Sc.- Ph.D. in Physics
- M. Tech. - Solid State Technology

### **Rajendra Mishra School of Engineering Entrepreneurship**

- Dual Degree - B.Tech. in Parent Dept/ Entrepreneurship Engineering

### **Rajiv Gandhi School of Intellectual Property Law**

- Bachelor of Laws - Intellectual Property Rights (3 Years)

### **Ranbir & Chitra Gupta School of Infrastructure Design and Management**

- M. Tech. - Infrastructure Design and Management

### **Reliability Engineering**

- M. Tech. - Reliability Engineering

### **Rubber Technology**

- M. Tech. - Rubber Technology

### **School of Information Technology**

- M. Tech. - Information Technology
- M. Tech. – Information and Communication Technology

### **School of Medical Science and Technology**

- Master of Medical Science and Technology (3 Years)
- M.Tech – Medical Imaging and Image Analysis (Withdrawn due to less than 5 students admission)

### **School of Water Resources**

- M. Tech. - Water Management

### **Vinod Gupta School of Management**

- MBA - Business Administration (2 Years) • Executive MBA (3 Years)

### **Distance Mode (Kolkata & Bhubaneswar Centre) (3 Years)**

- M.Tech - Electronics and Communication Engineering
- M.Tech - Electrical Engineering
- M.Tech - Information and Communication Technology

## Department of Aerospace Engineering

### **Head**

Prof. Bhriku Nath Singh

### **Professors**

Datta, Prosun Kumar	<i>Ph.D.(Georgia Tech), Aerospace Structures</i>
Maiti, Dipak K	<i>Ph.D.(IIT Kharagpur), Aerospace Structures, Composite and Smart Structures, Structural Dynamics &amp; Aeroelasticity, Design &amp; Development of MR fluid damper &amp; Landing Gear Dynamics, Structural Health Monitoring</i>
Singh, Bhriku Nath	<i>Ph.D.(IIT Kanpur), Smart and Composite Structures, Uncertainty Quantification in Aircraft Analysis &amp; Design, Multi-scale Modelling, FGM Plates and Shells, Adaptive Nonlinear FEM, Aerospace Structures, Solid Mechanics</i>
Singh, Navtej	<i>Ph.D.(IIT Kharagpur),</i>
Sinha Mahapatra, Kalyan Prasad	<i>Ph.D.(IIT Kharagpur), Computational Fluid Dynamics, Aeroacoustics, Large Eddy Simulation, Fluid-Structure Interaction</i>

### **Associate Professors**

Laha, Manas Kumar	<i>Ph.D.(IIT Kharagpur), computational fluid dynamics and flight mechanics</i>
Pradhan, Suresh Chandra	<i>Ph.D.(IIT Kanpur), Aerospace structures, Nonlocal elasticity, FEM, FGM, Smart Structures, composite materials and nano-composites, Optimization</i>
Roy, Arnab	<i>Ph.D.(IIT Kharagpur), Aerodynamics, Computational Fluid Dynamics</i>
Sinha, Manoranjan	<i>Ph.D.(IIT Kanpur), Flight Dynamics Controls System-Identification Neural Networks</i>

### **Assistant Professors**

Ghosh, Anup	<i>Ph.D.(IIT Kharagpur), Aerospace Structures, Composite Structures, Micro Air Vehicle</i>
Ghosh, Somnath	<i>Ph.D. (T.U., Munich), DNS, LES, compressible turbulence, turbulence-radiation interaction, turbulent reacting flows, high performance computing</i>
Joarder, Ratan	<i>Ph.D.(IISc. Bangalore), Supersonic Combustion, Computational Gas Dynamics, Laser Spark, Combustion Driven Shock Tunnel, Flow Diagnostics using Optical methods, Two-Phase Flow Computations</i>
Karmakar, Srinibas	<i>Ph.D.(LSU, USA), Rocket and Gas Turbine Propulsion, Combustion, Combustion of Energetic Particles (Metals/Metalloids), Experimental Methods in Combustion, Nanotechnology for Energy Applications, Atomization and Sprays</i>
Kaushik, Mrinal	<i>Ph.D.(IIT Kanpur), Theoretical studies on passive controlled</i>

jets, Theoretical studies on shock-boundary layer interactions, Theoretical studies on active feedback controlled jets, Experimental studies on aeroacoustics

Peyada, Naba Kumar *Ph.D.*, System Identification/Parameter Estimation - Neural Networks, Flight Dynamics & Control and Flight Testing, Design Guidance and Control of Rockets Parafoil UAV MAV WIG-Craft etc.

#### ***Faculty Appointments***

Naba Kumar Peyada	Assistant Professor
Somnath Ghosh	Assistant Professor
Ratan Joarder	Assistant Professor
Manoranjan Sinha	Associate Professor
Arnab Roy	Associate Professor
Srinibas Karmakar	Assistant Professor
Mrinal Kaushik	Assistant Professor

#### ***Faculty Retirement***

Rao, T. V.	Associate Professor
Gautam Bandyopadhyay (expired)	Professor

#### ***Faculty Re-employment***

Datta, Prosun Kumar	Professor
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#### ***Brief Description of on-going activities***

Department is involved in various research activities in different fields namely; Composite & Smart Structures Structural Dynamics & Aeroelasticity Design & Development of MR-fluid damper. Analysis of aerospace Structures using DQM, DTFM, FEM. Nanomaterials and nanomechanics. Development of reconfigurable autonomous air vehicle. Lunar gravity modeling, topography modeling and orbit determination for the Chandrayaan-I. Fault tolerant and reconfigurable architecture development for the automotive. Real time system identification, system identification using neural sensitivity analysis. Fault detection and identification for aircraft. Low Reynolds number airfoils for micro air vehicles. Analysis of High Reynolds number three dimensional flows. Supersonic and hypersonic flows for various configurations. Large eddy simulation of turbulent flow. Flow-induced vibration and fluid-structure interaction. Development of micro-aerial vehicles

#### ***Thrust Areas***

1. Computation of High-Speed High-Temperature Reactive Flows, Turbulent flow and large-eddy simulation, Combustion, Composite and smart structures, probabilistic analysis & design, Autonomous reconfigurable flight vehicle development and Chandrayaan-I project

#### ***New Acquisitions***

1. ePIV System including hardware and FLOWEX Software. Make: Interactive Flow Studies Corporation, USA. It is an educational Particle Image Velocimetry System meant for Laboratory demonstrations in Aerodynamics Laboratory.
2. DataTaker DT80 Logger with accessories- General purpose data acquisition system with 5 channels for strain measurements.
3. 3 DOF Gyro Workstation (QPID/QPIDE)-Quanser for Flight Mechanics and Control Lab
4. Pulsejet Nozzle AA 10000 JJAU-VI, Spraying Systems Co., for Propulsion Lab
5. Multimedia Projector, Make NEC, 3000 ANSI Lumens, 1024x768 resolution

#### ***Doctoral and MS Degrees Awarded***

1. Kalyan Kumar Das : Experimental and Large-eddy simulation of thunderstorm downburst(Ph.D.)
2. Shravankumar B. Kerur : Geometrically Nonlinear Static and Dynamic Analysis of Piezoelectric Fiber Reinforced Composite Plates and Shells(Ph.D.)
3. Bharadwaj Nanda : VIBRATION BASED DAMAGE ASSESSMENT OF FRAME STRUCTURES USING UNIFIED PARTICLE SWARM OPTIMIZATION(Ph.D.)

#### ***Member - Professional Bodies***

1. Pradhan, Suresh Chandra, *Member* - IE(I)
2. Pradhan, Suresh Chandra, *Member* - Aeronautical Society of India
3. Pradhan, Suresh Chandra, *Member* - ISSS
4. Pradhan, Suresh Chandra, *Member* - Computational Mechanics India
5. Maiti, Dipak K, *Member* - Aeronautical Society of India
6. Singh, Bhrigu Nath, *Life* - ISTE, India
7. Kaushik, Mrinal, *Life* - Indian Society of Theoretical and Applied Mechanics
8. Sinha Mahapatra, Kalyan Prasad, *Fellow* - Institute of Engineers
9. Sinha Mahapatra, Kalyan Prasad, *Member* - Aerospace Resources Panel of AR&DB
10. Sinha Mahapatra, Kalyan Prasad, *Life* - Aeronautical Society of India
11. Sinha Mahapatra, Kalyan Prasad, *Life* - Wind Engineering Society of India
12. Sinha Mahapatra, Kalyan Prasad, *Member* - Aerodynamics Panel of AR&DB
13. Datta, Prosun Kumar, *Senior Member* - Japan Soc. of Aeronautical and Space Sciences
14. Datta, Prosun Kumar, - Korean Society of Aeronautical and Space Sciences

#### ***Member - Editorial Board***

1. Datta, Prosun Kumar (0) *Editorial Board* - International J. of Struct. Stability and Dynamics
2. Datta, Prosun Kumar (2012) *International Advisory Board* - International Journal of Aeronautical and Space Sciences
3. Pradhan, Suresh Chandra (2010) *Member* - IJVSS
4. Pradhan, Suresh Chandra (2010) *Member* - IJETAETS
5. Sinha Mahapatra, Kalyan Prasad (2010) *Member, Editorial Board* - INTERNATIONAL JOURNAL OF FLUID DYNAMICS & AEROSPACE ENGINEERING
6. Sinha Mahapatra, Kalyan Prasad (2010) *Member* - Journal of Aerospace Engineering & Technology

#### ***Awards & Honours***

1. Singh, Bhrigu Nath (2013) *Most cited paper in Journal of Finite Elements in Analysis and Design ( Elsevier)*
2. Singh, Bhrigu Nath (2013) *Most downloaded Research paper in International Journal of Mechanical sciences*
3. Sinha, Manoranjan (2013) *President of India Gold Medal (IEI)*

### ***Sponsored Research Projects***

1. Aerodynamic design of traction rolling stock with speed potential of 250 km/h upgradeable to 350 km/h (CRR, Indian Railways, Rs.734.24 Lakhs)
2. Aerodynamics modeling of chaff bloom (DRDO, Defence Laboratory, Jodhpur, Rs.9.78 Lakhs)
3. Analysis and Development of Conceptual Design Methodologies for Air Collection and Enrichment System of Air Breathing Propulsion-Phase II (IIT – ISRO KCSTC, Rs.17.50 Lakhs)
4. Boeing University Relations, IIT Kharagpur- Campus Engagement Plan (Boeing Co., USA, Rs.23.50 Lakhs)
5. Combustion Characteristics of Single Droplets (ISIRD,SRIC, IIT Kharagpur, Rs.28.00 Lakhs)
6. Damage Assessment of Aircraft Structures From Limited Vibration Data (AR&DB, New Delhi, Rs.8.45 Lakhs)
7. Damage assessment of composite structures using swarm based optimization techniques from changes of vibrational response (ISRO IIT Kharagpur Cell, Rs.2756250.00 Lakhs)
8. DEVELOPMENT OF A NUMERICAL SCHEME TO STUDY THE AERODYNAMICS OF CHAFF CLOUD (AR&DB, Rs.17.05 Lakhs)
9. Estimation of Acoustic Load in MCA weapon bay and Hinge moment on the doors (ADA, Rs.17.28 Lakhs)
10. Large Eddy Simulation of AURA-type Flying Wing Configurations with Dragerons at Operating Speed Range (ADA, Bangalore, Rs.70.20 Lakhs)
11. Least square finite element analysis of adhesively bonded joint (AR &DB, Rs.4.45 Lakhs)
12. Nonlinear Analysis and Reconfigurable Control of Advanced Medium Combat Aircraft (AMCA) Operating at High Angle of Attack (AOA) (ADA, Bangalore, Rs.678000.00 Lakhs)
13. Numerical Prediction of Flow Field, Fountain Flow and Associated Noise in Supersonic Impinging Twin-Jet (AR&DB, Rs.16.80 Lakhs)
14. NUMERICAL STUDY ON ELECTRO-HYDRODYNAMICS OF IMMISCIBLE OR MISCIBLE FLUIDS WITH CONDUCTIVITY GRADIENT (DST, Rs.10.66 Lakhs)
15. Real time detection of face/core debond initiation and interfacial delamination propagation morphology in sandwich composite panels using fiber-optic (ISRO, Rs.49.80 Lakhs)
16. Studies on Passive Controlled Jets (ISIRD, IIT Kharagpur, Rs.28.00 Lakhs)
17. Study of Flow Structure and Associated Accoustics in Weapon Bay Cavity using LES (ADA, Bangalore, Rs.8.16 Lakhs)
18. THERMOHYDRAULIC SIMULATION OF LOX BOOSTER TURBOPUMP FOR SEMI-CRYOGENIC ROCKET ENGINE (ISRO, IIT KHARAGPUR Space Technology Cell,, Rs.10.18 Lakhs)
19. Uncertainty Quantification in Aircraft Analysis and Design (AR & DB, DRDO, New delhi, Rs.27.58 Lakhs)
20. WIND TUNNEL TESTING OF SCALED DOWN MODELS OF RAILWAY LOCOMOTIVE (Heavy Electro Works Private Ltd., Rs.1.25 Lakhs)

### ***Consultancy Projects***

1. AERODYNAMICS MODELING OF CHAFF BLOOM (DLJ, Rs.2.58 Lakhs)
2. WIND TUNNEL TESTING OF SCALED DOWN MODELS OF RAILWAY LOCOMOTIVE (HEWPL, Rs.1.25 Lakhs)

### **Visits Abroad by Faculty Members**

1. Roy, Arnab - Visited the Institute under the DAAD Faculty Exchange Programme (Institute for Aerodynamics and Gas Dynamics, TU Stuttgart, ) May-July, 2013

### **Invited Lectures by Faculty Members**



1. Mixed Variational Approach for the Analysis of FGM Plate by Singh, Bhriugu Nath (NIT Durgapur)

### ***Papers Published in Journals***

1. A new shear deformation theory for the static analysis of laminated composite and sandwich plates By Sahoo, Rosalin and Singh, B. N. *International Journal of Mechanical Sciences* 75, 324-33 (2013)
2. A new inverse hyperbolic zigzag theory for the static analysis of laminated composite and sandwich plates By Sahoo, Rosalin and Singh, B. N. *Composite Structures* 105, 385-397 (2013)
3. An efficient C0 finite element modeling of an inverse hyperbolic shear deformation theory for the flexural and stability analysis of laminated composite and sandwich plates By Grover, Neeraj, Maiti, D. K. and Singh, B. N. *Finite Elements in Analysis and Design* 80, 11-22 (2014)
4. Buckling and post-buckling response of laminated composite plate with random system properties By Dash Padmanav and Singh B. N., *Mechanics of Advanced Materials and Structures* 21(6), 516-529 (2014)
5. CFD Analysis of Energy Separation in Ranque – Hilsch Vortex Tube at Cryogenic Temperature By Dutta T., Sinhamahapatra K.P. and Bandyopdhyay S.S. *Journal of Fluids* 2013, 14 pages (2013)
6. CFD Study on the Effects of Nozzle Number on Turbulent Flow and Energy Separation in a Ranque-Hilsch Vortex Tube By Bej Nilotpala, Sinhamahapatra K.P. *Applied Mechanics and Materials* 465-466, 505-509 (2014)
7. Corrugated Limiting Tab for Jet Mixing By Mrinal Kaushik and Rathakrishnan E. *International Journal of Turbo & Jet-Engines* Vol 30, pp 359–373 (2013)
8. Dynamic behaviour of stepped multilayered viscoelastic beams By Datta,P.K., Roy,H. and Dutt, J.K., *Advances in Vibration Engineering* 12(1), 75-88 (2013)
9. Effect of Rare-earth Oxide Catalysts on the Ignition and Combustion Characteristics of Boron Nanoparticles By S. Karmakar, N. Wang, S. Acharya, and K.M. Dooley *Combustion and Flame* 160(12), 3004-3014 (2013)
10. Effects of distributed pressure gradients on the pressure-strain correlations in a supersonic nozzle and diffuser. By Somnath Ghosh and Rainer Friedrich *Journal of Fluid Mechanics* vol. 742, pp 466-494 (2014)
11. Effects of Porous Internal Components on Liquid Slosh Dynamics By Kumar A., Sinhamahapatra K.P. *Journal of Porous Media* 16, 725-747 (2013)
12. Flexural behavior of general laminated composite and sandwich plates using a secant function based shear deformation theory By Neeraj Grover, D. K. Maiti, B. N. Singh *Latin American Journal of Solids and Structures* 11(7), 1275-1297 (2013)
13. Flight Dynamics and Optimization of Three Dimensional Perching Maneuver By Alikhan, M., Peyada, N. K., Go, T. H. *Journal of Guidance, Control, and Dynamics* Vol. 36, No. 6 (2013)
14. GEOMETRICALLY NON-LINEAR BENDING ANALYSIS OF PIEZOELECTRIC FIBER-REINFORCED COMPOSITE (MFC/AFC) CROSS-PLY PLATE UNDER HYGROTHERMAL ENVIRONMENT By Shrivankumar B. Kerur and Anup Ghosh *Journal of Thermal Stresses* 36: 1255–1282 (2013)
15. Large amplitude free vibration analysis of thermally post-buckled composite doubly curved panel embedded with SMA fibres By S. K. Panda and Singh, B. N. *Nonlinear Dynamics* 74(1-2), 395-418 (2013)
16. New Non-polynomial Shear Deformation Theories for the Structural Behavior of Laminated Composite and Sandwich Plates By Grover Neeraj, Singh, B. N. and Maiti D. K., *AIAA Journal* 51(8), 1861-71 (2013)

17. Nonlinear finite element analysis of thermal post-buckling vibration of laminated composite shell panel embedded with SMA fibre By S. K. Panda and Singh, B. N. *Aerospace Science and Technology* 29 (1), 47-57 29(1), 47-59 (2013)
18. Numerical Simulation of Low Reynolds Number Incompressible Flow over Two Side-by-Side Circular Cylinders By Singha Sintu and Sinhamahapatra K.P. *Journal of Aerospace Engineering and Technology* 3, 22-54 (2013)
19. Numerical Simulation of Shock-Vortex Interaction in Schardins Problem By Halder Pabitra, De Sudipta, Sinhamahapatra K.P., Singh N. *Shock Waves* 23, 495-504 (2013)
20. Static and dynamic instability characteristics of thin plate like beam with internal flaw subjected to in-plane harmonic load By Datta, P.K. and Rahul, R., *Intl. J. of Aeronautical & Space Sci.* 14(1), 19-29 (2013)
21. Stochastic First-Ply Failure Analysis of Laminated Composite Plates under in Plane Tensile Loading By AM Gadade, A Lal, BN Singh *Advanced Materials Research* 747, 269-272 (2013)
22. Stochastic Methods for the Analysis of Uncertain Composites By Grover Neeraj, and Singh, B. N. *Journal of the Indian Institute of Science* 93 (4), 603-620 (2013)
23. Stochastic perturbation-based finite element for buckling statistics of FGM plates with uncertain material properties in thermal environments By Talha Md. and Singh B. N. *Composite Structures* 108, 823-833 (2014)
24. Structural damage assessment using FRF employing Particle Swarm Optimization By S. C. Mohan, D. K. Maiti and D. Maity *Applied Mathematics and Computation* 219, 10387-10400 (2013)
25. Thermal Post-Buckling Behavior of Laminated Composite Spherical Shell Panel Using NFEM By S. K. Panda and Singh, B. N. *Journal of Mechanics Based Design of Structures and Machines* 41(4), 468-488 (2013)
26. Thermomechanical Elastic Post-Buckling of Functionally Graded Materials Plate with Random System Properties By KR Jagtap, Achchhe Lal, BN Singh *International Journal for Computational Methods in Engineering Science and Mechanics* 14(3), 175-194 (2013)

### ***Papers Presented in Conferences***

1. Effects of radiative heat transfer on the turbulence structure in inert and reacting mixing layers, By S. Ghosh, R. Friedrich, C. Stemmer, B. Cuenot and M El Hafi, *Turbulence and shear flow phenomena* 8, Poitiers, France, (2013)
2. An improved algorithm for interprocessor communication in distributed parallel computing, By Poonkodi S., and Sinhamahapatra K.P., *International Conference on Meta Computing, ICOMEC 2013*, Bhubaneswar, (2013)
3. Buckling Load Characteristics Of Composite Plates With And Without Internal Flaws Using FEM, By Sreehari V. M., Jebieshia T. R. and D. K. Maiti, *International Conference on Materials for Future (ICMF)*, Government Engineering College, Thrissur, (2013)
4. Catalytic Combustion of AP-HTPB based Composite Solid Rocket Propellants using Metal Phthalocyanines, By Lalith Varun Kakumanu, Narendra Yadav, Srinibas Karmakar, *22nd National and 11th ISHMT-ASME Heat and Mass Transfer Conference*, IIT Kharagpur, India, (2013)
5. CFD Analysis of a Vortex Tube Air Separator for Space Transportation, By Gaurav Sharma, Sumana Ghosh, Srinibas Karmakar, *8th International Conference on Multiphase Flow, ICMF 2013*, Jeju, Korea, (2013)
6. CFD Analysis of Vortex Tube, By G. Sharma, S. Karmakar, S. Ghosh, *22nd National and 11th ISHMT-ASME Heat and Mass Transfer Conference*, IIT Kharagpur, India, (2013)
7. CFD study of the effects of nozzles number on turbulent flow and energy separation in a Ranque Hilsch vortex tube, By Bej Nilotpala, Sinhamahapatra K.P., *ICME2013*, Universiti Tun Hussein Onn Malaysia, (2013)

8. Combustion Characteristics of Ethanol Droplets Containing Boron Nanoparticles, By Srinibas Karmakar, Sumanta Acharya, *22nd National and 11th ISHMT-ASME Heat and Mass Transfer Conference*, IIT Kharagpur, India, (2013)
9. Development of a 3D numerical code for the simulation of an isolated downburst using rotating impinging jet mode, By Das K.K., and Sinhamahapatra K P., *International Workshop on 'Wind Engineering – Prospects and Challenges*, Guwahati, (2013)
10. Effect of preheat and air - fuel ratio on the performance of a realistic gas turbine combustor - A computational study, By P. Srinag, G.Sivaramakrishna, S.Kishore Kumar and Arnab Roy, *23rd National Conference on I. C. engines and Combustion*, NIT Suratkal, (2013)
11. Exergy Analysis and CFD Study of Counter Flow Ranque-Hilsch Vortex Tube Using Turbulence Models, By Bej Nilotpala, Sinhamahapatra K.P., , *22nd National and 11th International ISHMT-ASME Heat and Mass Transfer Conference*, IIT Kharagpur, (2013)
12. Experimental and Numerical Simulation of Downburst using Impinging Jet Mode, By Das K.K., Sinhamahapatra K.P., Ghosh A.K., *12th Americas Conference on Wind Engineering*, Seattle, USA, (2013)
13. Flow field studies over V-shaped rear face cavities at supersonic speed, By Srinivasan G., Sinhamahapatra K P. and Das S.,, *14th CFD Symposium*, Bangalore, (2012)
14. Free Vibration Of Damaged Composite Structures Using FEM, By Jebieshia T. R., Sreehari V. M. and D. K. Maiti, *International Conference on Materials for Future (ICMF)*, Government Engineering College, Thrissur, (2013)
15. LES of turbulence-radiation interaction in plane reacting and inert mixing layers, By S. Ghosh, R. Friedrich, C. Stemmer, *Direct and Large eddy simulation 9*, Dresden, Germany, (2013)
16. Numerical Investigation of Convective Heat Transfer from a Hot Wall Assisted by a Vortex Generator, By Supradeeepan Katiresan, Arnab Roy, *22nd National and 11th International ISHMT-ASME Heat and Mass Transfer Conference*, IIT Kharagpur, (2013)
17. Numerical Investigation of Three Dimensional Cavity Flow, with a Curved Base, using Space-Time Conservation and Solution Element Method, By Poonkodi S., Srinivasan G., and Sinhamahapatra K.P, *WORLD CONGRSS on Frontiers of Mechanical, Aeronautical and Automobile Engineering (WCFMAAE-2013)*, New Delhi, (2013)
18. Numerical Investigation on Forced Convective Heat Transfer Using Improved CFRUNS, By Supradeeepan Katiresan, Arnab Roy, *HEFAT2014*, Orlando, Florida, USA, (2014)
19. Numerical Simulation of Combustion in a Single Element H<sub>2</sub> - O<sub>2</sub> Cryogenic Engine, By N Sahoo, Biju Kumar. K.S, Arnab Roy, N. Jayan, V. Narayanan, *International Conference on Energy & Environment (ICEE - 13)*, , (2013)
20. Numerical study on low Reynolds number flow past two side by side triangular cylinders, By Supradeeepan Katiresan, Arnab Roy, *44th AIAA Fluid Dynamics Conference*, Atlanta, USA, (2014)
21. Qualitative Analysis of Transonic Flow Past Open Cavity Using Conservation Element and Solution Element Method, By PoonKodi S., Sinhamahapatra K.P., *22nd National and 11th International ISHMT-ASME Heat and Mass Transfer Conference*, IIT Kharagpur, (2013)

## Department of Agricultural & Food Engineering

### **Head**

Prof. P B Singh Bhadoria

### **Professors**

Banerjee, Rintu	<i>Ph.D.(IIT Kharagpur)</i> , Food Biotechnology, Bioenergy, Enzymology & its Biotechnological applications, Protein Chemistry
Bhadoria, P B Singh	<i>Ph.D.(IIT Kharagpur)</i> , Development and transfer of rural technology, Soil Science & Plant nutrition
Das, Susanta Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Mechanized Food Processing and Food Engineering
Datta, Ashis Kumar	<i>Ph.D.(Pennsylvania)</i> , Dairy and Food Process Engineering, Process Systems Analyses and Simulations
Dutta Gupta, Snehasish	<i>Ph.D.(Kalyani Univ)</i> , Plant Tissue Culture & Biotechnology
Ghosh, Bijoy Chandra	<i>Ph.D.(IIT Kharagpur)</i> , Soil less culture Organic farming Tea production and processing
Goswami, Tridib Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Cold Storage, CA and MA storage of fruits and vegetables, Cryogenic grinding of spices, Discrete Element Analysis of grinding, CFD analysis of temperature distribution in precooler
Jha, Madan Kumar	<i>Ph.D.(Japan)</i> , Groundwater Management using RS-GIS and MCDM Techniques, Basin-wide Numerical Modeling of Groundwater Systems, Inverse Modeling for Aquifer Parameter Estimation, Rainwater Harvesting and Artificial Recharge, Groundwater Investigation-Recharge Analysis and Seawater Intrusion
Mal, Bimal Chandra	<i>Ph.D.(IIT Kharagpur)</i> , Aquacultural Engineering
Mallick, Nirupama	<i>Ph.D.(BHU, Varanasi)</i> , Microalgal Biofuel, Biodegradable Polymers (Polyhydroxyalkanoates) from Cyanobacteria, Bioremediation with Microalgae, Bioactives from Microalgae
Mishra, Hari Niwas	<i>Ph.D.(IIT Kharagpur)</i> , Algal Food Biotechnology, RTE Health Foods & Nutraceuticals, Innovative Food Processing Technologies, Horticultural & Plantation Crop Products Processing, Food Safety & Quality Control, High pressure processing of high value perishables
Mitra, Adinpunya	<i>Ph.D.(East Anglia UK)</i> , Exploring biological activities from in vitro conserved Gentianaceae medicinal plants, Regulation of shikimate/phenylpropanid and MVA/MEP pathways in hairy root cultures of <i>Daucus carota</i> , Understanding molecular oscillations of scent volatiles emission in moth-pollinated flowers, Enzymatic route to phenolic fragrance formation in <i>Hemidesmus indicus</i> roots, Evaluating metabolic perturbations in cryptogein-cotransformed root cultures of <i>Nicotiana tabacum</i> , Medium-term in vitro conservation and sustainable utilization of Gentianaceae fragile bioresources, Identification of flavour trait(s) in Darjeeling tea accessions by targeted metabolomics, Targeted metabolomics of scented rice cultivars

Panda, Rabindra Kumar	<i>Ph.D.(IARI Delhi)</i> , Watershed Management, Non-point Source Pollution of Soil & Water, Climate Change Effect on Agriculture, Rainwater Management
Panda, Sudhindra Nath	<i>Ph.D.(PAU, Ludhiana)</i> , Integrated Land and Water Resources Planning and Management, Rainwater Conservation and Reuse for Climate Resilient Agriculture
Pandey, Keshaw Prasad	<i>Ph.D.(IIT Kharagpur)</i> , 1 Tractor power systems 2. Traction modelling 3. Precision agriculture
Raghuwanshi, Narendra Singh	<i>Ph.D.(California)</i> , Irrigation and Water Management, Hydrological Modelling, Watershed Management
Raheman, Hifjur	<i>Ph.D.(Bangkok)</i> , Development of farm Implements, Biofuel production and hybrid power generation, Traction and tillage performance improvement in walking tractor
Singh, Rajendra	<i>Ph.D.(IIT Kharagpur)</i> , Hydrological Modelling, Irrigation System Management
Tewari, Virendra Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Farm Machinery & Power, Ergonomics & Safety, Precision Agriculture
Tiwari, Kamlesh Narayan	<i>Ph.D.(IARI Delhi)</i> , Micro Irrigation, Greenhouse Technology, Remote Sensing & GIS Applications in Water Resources and Watershed Management

***Associate Professors***

Chatterjee, Chandranath	<i>Ph.D (IIT Kharagpur)</i> , Flood Forecasting, Design Flood Estimation, Flood Inundation Modeling and Hazard Assessment, Remote Sensing and GIS Applications in Surface Water Hydrology, Hydrological Modeling
Das, Bhabani Sankar	<i>Ph.D.(Kansas)</i> , Spectral characterization of soils and water, Rice hydrology, Measurement and modeling of water and nutrient status in soil, Pedotransfer functions
Das, Madhusweta	<i>Ph.D.(Jadavpur Univ)</i> , Functional Foods, Starch based edible and biodegradable film, Isolation of bioactive component from food waste
Majumdar, Gautam Chandra	<i>Ph.D.(IIT Kharagpur)</i> , Food Process Engineering
Mishra, Ashok	<i>Ph.D.(IIT Kharagpur)</i> , Hydrological modelling & Watershed management, Crop yield modelling, Climate change analysis & applications in water and crop management
Mitra, Arunabha	<i>Ph.D.(Calcutta Univ)</i> , Value based education, Waste utilization in aquaculture, Ecology and environmental pollution, Chemical-free farming, Mind and consciousness, Stress management and control
Srinivasa Rao, Pavuluri	<i>Ph.D.(IIT Kharagpur)</i> , Recirculatory Aquacultural Systems, Post Harvest & Food Process Engineering, High Pressure Processing of High Value Perishable Commodities, Grain Storage Structures and Stored Grain Quality, Non-thermal Methods of Food Processing
Swain, Dillip Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Sustainable & Precision Production Agriculture, Climate Change Adaptations & Mitigations, Crop Growth & Yield Simulation

Thomas, E V *Ph.D.(IIT Kharagpur)*, Farm Machinery & Power, Rice Transplanter, Tea Process Machinery

#### ***Assistant Professors***

Guha, Proshanta *Ph.D.(IIT Kharagpur)*, 1.Agronomy 2.Post-harvest Technology 3.Forest and Wasteland Management 4.Weed & Water Management

Mailapalli, Damodhar Rao *Ph.D.(IIT Kharagpur)*, Agricultural water and waste management, Irrigation hydraulics and modeling, Nonpoint source agricultural pollution, Cold region hydrology

Mukherjee, Chanchal Kumar *MS (New Jersey)*, Cage for mariculture

Nalavade, Parish Prakash *D. Eng. (A I T, Thailand)*, Tillage and Traction, Soil-Tool Interaction, Precision Agriculture

Shrivastava, Shanker Lal *Ph.D.(IIT Kharagpur)*, Post Harvest Engineering, Dairy & Food Process Engineering, Development of low cost - farm level processing equipment

Srivastav, Prem Prakash *Ph.D.(IIT Kharagpur)*, Food Science and Technology

Tripathy, Punyadarshini Punam *Ph.D.(IIT Delhi)*, Heat and Mass transfer during drying of food products, Mathematical modeling and simulation in food drying process, CO<sub>2</sub> mitigation in solar dryers, CO<sub>2</sub> capture and storage

#### ***Faculty Appointments***

Mishra, Ashok Associate Professor

#### ***Faculty Retirement***

Majumdar, Gautam Chandra Associate Professor

#### ***Faculty Re-employment***

Ghosh, Bijoy Chandra Professor

#### ***Brief Description of on-going activities***

Application of GIS in both command area & watershed management, Application of neural network in hydrology, Ballast management of agricultural tractors, Biofiltration Technology, Bio-fuels from tree-based oils, Biosynthesis of phenolic fragrance and xanthenes, Cage for mariculture, Climate change analysis & applications in water and crop management, Coal biotechnology, Design and development of continually variable transmission for tractors, Design , development and field evaluation of a small power tractor, Design and development of slip meter for two-wheel drive tractors, Design and development of automatic depth control system for tractors, Design and development of ergo NVH\_ag 1.0 software, Design and development of noise and vibration reducing device for hand tractor, Design and development of noise and vibration reducing device for vertical conveyer reaper, Design of a centrifugal press for semi-continuous production of paneer, Development of aseptic packaging system for milk, Development of environment-friendly aquaculture, Development of food products, Development of machineries and process technology for cereals & pulses based snacks, Development of rice transplanter, Development of a continuous chhana making device, Development of jacketed scraped surface vessel for kneading, heating and concentration of high viscosity liquids and pastes, Development of endless chain pressure dryer for orthodox tea, Design of a centrifugal press for semicontinuous production of paneer, Development of Cashew nut sheller and Cashew peeler, Evaluation of cosmetic properties of Aloe vera L., Flow and

solute transport in sub-surface environment, Food Packaging, High pressure processing of high value perishables, Hydrological modelling of small watersheds, Imaging photosynthesis of micropropagated plants, Integration of surface irrigation and two-dimension infiltration model, Machinery systems and ergonomics, Microalgal biofuel, Microbial degradation of plant phenolics for value-added products, Impact of light emitting diodes (LEDs) on plant morphogenesis, Microwave assisted drying of high moisture food, Nutrient management, Polyhydroxyalkanoates from Cyanobacteria, Predicting traction performance using artificial neural network, Process technology for dehydration of mushrooms, Production and processing of tea, Production of tannase under solid state fermentation, Process technology for dahi powder & dahi powder based energy drink mix, Process technology for antioxidant rich RTE health food, Process technology for manufacture of RTE health food (herbal kurkure), Rainwater harvesting and groundwater recharge, Software development for machinery management, Spectral characterization of soils, Starch based edible and biodegradable film, Thermal analysis of food materials, Traction potential of bias-ply tyres used in agricultural tractors, Water quality and watershed management

### ***Thrust Areas***

1. Agricultural Biotechnology
2. Agro-Informatics
3. Mechanized Food Processing
4. Natural Resources Management
5. Precision Farming

### ***New Acquisitions***

1. Microprocessor Controlled Testing Machine-5KN, Instron, USA

### ***International Collaborations***

Technical University of Braunschweig, Germany

Department of Geoinformatics, Geohydrology and Modeling, Friedrich-Schiller-University, Jena, Germany

Biosystems Engineering Department, College of Agriculture, Sam Ginn College of Engineering, Auburn University, USA

Institute of Water Resources Management, Hydrology and Agricultural Hydraulic Engineering, Leibniz University Hannover, Germany

ALTERRA-Centre for Water and Climate, Wageningen University, The Netherlands

Waikato Institute of Technology, Hamilton, New Zealand

United Nations University, Tokyo, Japan (Collaborator: Prof. Srikantha Herath): Research and education, Network on climate change adaptation research

MoU Agreement : Signed MoU as Focal Point for 'University Network for Climate and Ecosystem Change Adaptation Research (UNCECAR)', with United Nations University, Tokyo, JAPAN

Dr. Thomas Crawford, Department of Geography, East Carolina University, Greenville, NC USA 27858 USA. Under a scoping project-"Human Responses to Catastrophic Monsoon Events in South

Asia: Designing a Spatially Explicit Model in Low-Lying Coastal Bangladesh and India" funded by Asian Pacific Network for Global Change Research (APN).

The Coordinated Climate-Crop Modeling Project, USA (Collaborators: Dr. Cynthia Rosenzweig, NASA-Goddard Institute for Space Studies and Columbia University, USA, Agricultural Model Intercomparison and Improvement Project): Research, Analysis of uncertainty in the agricultural impacts of climate change

### ***Lectures by Visiting Experts***

1. Food engineering and technology research at University of Reading and global trends by Prof. K. Niranjana (University of Reading, UK)

### ***Doctoral and MS Degrees Awarded***

1. Jitendra Kumar : Design and development of a Chironji Nut (*Buchanania lanzan*) decorticator(Ph.D)
2. Arindam Kuila : Enzymatic Hydrolysis and fermentation of non-edible lignocellulosic feedstocks for ethanol production(Ph.D)
3. Shovik Deb : Dynamics of organic carbon in soils under coastal Agro-ecosystem(Ph.D)
4. Kadam Swati Appasaheb : Optimized process parameters based heat and mass transfer guided design and process simulation of continuous kheer (rice pudding) machine(Ph.D)
5. Shalini Mishra : Symbiotic soy yoghurt: process technology, quality characteristics and storage stability(Ph.D)
6. Anish Kundu : Understanding fragrant methoxybenzaldehyde biosynthesis in *Hemidesmus indicus* roots and evaluation of the bioactive capacity of this phenolic aldehyde(Ph.D)
7. Sudhansu Sekhar Mahanand : Development of a biofloc based tank aquaculture system for Rohu, *Labeo rohita* (Hamilton) culture(Ph.D)
8. Avinash Kumar : Engineering and economic analysis of pooled circular stepped cascade aeration system(Ph.D)
9. Swarnalok De : Extraction characterisation of humic acid from lignite and evaluation of its biological activities(MS)
10. Sumeet Kaur : Development and characterization of barley flaxseed based functional dry soup mix(Ph.D)
11. Mainak Mukhopadhyay : Production, purification, characterisation of yellow Laccase and its application for lignin degradation(Ph.D)
12. Kshirod Kr. Dash : Fluidized bed preconditioning of rice and its microwave puffing(Ph.D)
13. Upadrasta Laksmishri : Bioliquefaction of lignite for production of humic acid and bio-methane(Ph.D)
14. Anirban Ray : Physical and Biochemical characterization of gel from different growth periods of *Aloe vera L.*(Ph.D)
15. Uttam Kumar : Force requirement for separating rice seedlings from seedling mats(Ph.D)

### ***Member - Professional Bodies***

1. Mallick, Nirupama, *Regular* - Life Member: Biotech Research Society of India
2. Mitra, Adinpunya, *Life Member* - Society for Plant Biochemistry and Biotechnology (India)
3. Mitra, Adinpunya, *Life member* - Association of Microbiologists of India
4. Mitra, Adinpunya, *Life Member* - Biotech Research Society of India
5. Mitra, Adinpunya, *Life Member* - Plant Physiology Forum
6. Das, Madhusweta, *Regular* - American Society of Agricultural and Biological Engineers
7. Guha, Proshanta, *Life Member* - Indian Society of Plant Physiology
8. Guha, Proshanta, *Life Member* - Association of Rice Research Workers
9. Guha, Proshanta, *Life member* - Indian Science Congress Association



10. Guha, Proshanta, *Life member* - Indian Society of Weed Science
11. Srivastav, Prem Prakash, *Member* - Institute of Food Technologists
12. Srivastav, Prem Prakash, *Life Member* - ISTE
13. Srivastav, Prem Prakash, *Life member* - ISTE
14. Srivastav, Prem Prakash, *Life Member* - AFST(I)
15. Srivastav, Prem Prakash, *Life Member* - IDA
16. Srivastav, Prem Prakash, *Member* - American Society of Agricultural and Biological Engineers
17. Srivastav, Prem Prakash, *MTIE* - Institution of Engineers
18. Srivastav, Prem Prakash, *Life member* - Association of Microbiologists of India
19. Shrivastava, Shanker Lal, *Member* - Agricultural Engineering Society, Kharagpur
20. Shrivastava, Shanker Lal, *Life Member* - Association of Food Scientists and Technologists (India)
21. Srinivasa Rao, Pavuluri, *Life member* - Indian Society of Agricultural Engineers
22. Srinivasa Rao, Pavuluri, *Members* - Institute of Food Technologists (USA)
23. Srinivasa Rao, Pavuluri, *Life member* - Association of Food Scientists and Technologists
24. Srinivasa Rao, Pavuluri, *Member* - American Society of Agricultural and Biological Engineers
25. Srinivasa Rao, Pavuluri, *Life Member* - Andhra Agricultural Association
26. Srinivasa Rao, Pavuluri, *Member* - Institution of Engineers (India)
27. Swain, Dillip Kumar, *Life member* - Indian Society of Agronomy
28. Swain, Dillip Kumar, *Member* - American Society of Agronomy
29. Swain, Dillip Kumar, *Member* - International Society for Environmental Information Sciences
30. Swain, Dillip Kumar, *Life member* - Indian Science Congress Association
31. Swain, Dillip Kumar, *Annual* - American Association of Advancement in Science
32. Mishra, Ashok, *Life Member* - Indian Society of Agricultural Engineers.
33. Mishra, Ashok, *Life Member* - Indian Water resources Society (IWRS)
34. Mishra, Ashok, *Member* - Environmental & Water Resources Institute (EWRI), American Society of Civil Engineers (ASCE)
35. Mailapalli, Damodhar Rao, *Member* - Institution of Engineers
36. Tripathy, Punyadarshini Punam, *Life member* - Indian Society of Agricultural Engineers
37. Bhadoria, P B Singh, *Member* - Ministry of Rural Development (NREGA Division). Govt. of India
38. Bhadoria, P B Singh, *Member* - German Society of plant nutrition and soil science
39. Bhadoria, P B Singh, *Member* - Directorate of Micro & Small Scale Enterprise (Govt. of West Bengal)
40. Bhadoria, P B Singh, *Life Member* - Indian Society of Soil science
41. Bhadoria, P B Singh, *Member* - Agril. Engg Society, IIT Kharagpur
42. Mukherjee, Chanchal Kumar, *Associate member* - Aquaculture Engineering society, USA
43. Mukherjee, Chanchal Kumar, *Member* - World Aquaculture Society
44. Mukherjee, Chanchal Kumar, *regular* - Society of Fisheries technologists of India
45. Mukherjee, Chanchal Kumar, *regular* - Institution of Engineers India
46. Mukherjee, Chanchal Kumar, *Regular* - Society of Naval Architects & marine Engineers USA
47. Tiwari, Kamlesh Narayan, *Regular Member* - American Society of Agricultural and Biological Engineers
48. Tiwari, Kamlesh Narayan, *Life Member* - Indian Society of Agricultural Engineers
49. Tiwari, Kamlesh Narayan, *Life Member* - Indian Society of Remote Sensing
50. Tiwari, Kamlesh Narayan, *Senior Member* - Institution of Engineers (India)
51. Tiwari, Kamlesh Narayan, *Life Member* - Indian Water Resources Society
52. Mitra, Arunabha, *Full Founding Member* - Asian Fisheries Society, Philippines
53. Mitra, Arunabha, *Life Member* - Indian Science Congress
54. Mitra, Arunabha, *Member* - Research Advisory Committee, Central Institute of Fisheries Education, ICAR, Govt. of India

55. Mitra, Arunabha, *Member* - Board of Studies, Aquaculture Management & Technology, Vidyasagar University, Midnapore
56. Mitra, Arunabha, *Member* - Expert Body on Water Resilient Aquaculture - Vision for 2050, Central Institute of Freshwater Aquaculture(ICAR), Bhubaneswar
57. Mitra, Arunabha, *Life Member* - Zoological Society of India
58. Mitra, Arunabha, *Regular* - World Aquaculture Society, USA
59. Mitra, Arunabha, *Life Member* - Inland Fisheries Society of India
60. Das, Susanta Kumar, *Regular* - American Society of Agricultural and Biological Engineers, USA
61. Datta, Ashis Kumar, *Ordinary* - Indian Dairy Association (IDA)
62. Datta, Ashis Kumar, *Life Member* - All India Council for Technical Education (AICTE)
63. Datta, Ashis Kumar, *Member* - American Society of Agricultural and Biological Engineers (ASABE)
64. Datta, Ashis Kumar, *Life Member* - Indian Dairy Engineers Association (IDEA)
65. Mal, Bimal Chandra, *Life member* - Institution of Engineers (I)
66. Mal, Bimal Chandra, *Life Member and Fellow* - Feloow, Indian Society of Agricultural Engineers
67. Mal, Bimal Chandra, *Life member* - Indian Association of Soil and Water Conservationists
68. Mal, Bimal Chandra, *Life member* - Water Management Society of India
69. Mal, Bimal Chandra, *Member* - American Society of Agricultural and Biological Engineers
70. Singh, Rajendra, *Member* - Irrigation Management Network, UK
71. Singh, Rajendra, *Life Member* - ISAE
72. Thomas, E V, *Regular Member* - American Society of Agricultural and Biological Engineers
73. Thomas, E V, *Associate Member* - Institution of Engineers (India)
74. Thomas, E V, *Regular Member* - Indian Society of Agricultural Engineers
75. Goswami, Tridib Kumar, *Life* - Indian Society of Cryogenic Engineers
76. Goswami, Tridib Kumar, *Life* - Association of Food Scientists and Technologists (AFST)
77. Goswami, Tridib Kumar, *Regular* - American Society of Agricultural and Biological Engineers (ASABE)
78. Goswami, Tridib Kumar, *Life* - Indian Association of Chemical Engineers (AIChE)
79. Tewari, Virendra Kumar, *Regular* - Indian Society for Technical Education
80. Tewari, Virendra Kumar, *Regular* - American Society of Agricultural and Biological Engineers
81. Tewari, Virendra Kumar, *Regular* - Indian Society of Weed Science
82. Tewari, Virendra Kumar, *Regular* - Association of Food Scientists and Technology (India)
83. Tewari, Virendra Kumar, *Regular* - Indian Society of Ergonomics
84. Dutta Gupta, Snehasish, *Fellow Member* - Plant Tissue Culture Association (India)
85. Dutta Gupta, Snehasish, *Regular* - Society for In Vitro Biology, USA
86. Dutta Gupta, Snehasish, *Regular* - European Federation of Biotechnology
87. Dutta Gupta, Snehasish, *Life* - Indian Society for Plant Physiology
88. Panda, Rabindra Kumar, *Life Member* - Asia Pacific Association of Hydrology and Water Resources
89. Panda, Rabindra Kumar, *Life Member* - Indian Society of Agro-meteorologist
90. Panda, Rabindra Kumar, *Associate Member* - American Society of Agricultural and Biological Engineers
91. Panda, Rabindra Kumar, *Life Member* - Indian Society of Agricultural Engineers
92. Panda, Rabindra Kumar, *Life Member* - Indian Society of Water Management
93. Mishra, Hari Niwas, *Past President & Life Member* - Association of Food Scientists & Technologists (India)
94. Mishra, Hari Niwas, *Member* - All India Food Processors Association
95. Mishra, Hari Niwas, *Member* - Indian Society of Agricultural Engineers
96. Mishra, Hari Niwas, *President* - Association of Food Scientist & Technologists (Kharagpur Chapter)
97. Panda, Sudhindra Nath, *Life Member* - Indian Assoc. of Soil & Water Conservationists
98. Panda, Sudhindra Nath, *Member* - International Assoc. of Hydrological Sciences

99. Panda, Sudhindra Nath, *Member* - American Soc. of Agric. and Biological Engineers
100. Panda, Sudhindra Nath, *Life Member* - Indian Society of Water Management
101. Panda, Sudhindra Nath, *Member* - American Society of Civil Engineers
102. Panda, Sudhindra Nath, *Life Member* - Systems Society of India
103. Panda, Sudhindra Nath, *Life Member* - Indian Society of Agricultural Engineers
104. Raheman, Hifjur, *Member* - Member of the American Society of Agrcultural & biological Engineers
105. Raheman, Hifjur, *Life Member* - Indian Society of Agrcultural Engineers
106. Raheman, Hifjur, *Fellow* - Institution of Engineers India
107. Jha, Madan Kumar, *Life Member* - Institution of Engineers India (IEI), Kolkata
108. Jha, Madan Kumar, *Life Member* - Indian Society for Technical Education (ISTE), New Delhi
109. Jha, Madan Kumar, *Life Member* - AIT Alumni Association, Bangkok, Thailand
110. Jha, Madan Kumar, *Life Member* - Indian Water Resources Society (IWRS), Roorkee
111. Jha, Madan Kumar, *Life Member* - National Environmental Science Academy (NESA), New Delhi
112. Jha, Madan Kumar, *Life Member* - Indian Association of Soil and Water Conservationists, Dehradun
113. Jha, Madan Kumar, *Life Member* - Association of Global Groundwater Scientists (AGGS), Dhanbad
114. Jha, Madan Kumar, *Life Member* - Indian Society of Agricultural Engineers (ISAE), New Delhi
115. Jha, Madan Kumar, *Member* - International Association of Hydrogeologists (IAH), U.K.
116. Jha, Madan Kumar, *Member* - International Association of Hydrological Sciences (IAHS), U.K.
117. Jha, Madan Kumar, *Life Member* - Indian Science Congress Association, Kolkata
118. Jha, Madan Kumar, *Member* - European Water Resources Association (EWRA), Greece
119. Jha, Madan Kumar, *Life Member* - Indian Society of Agricultural Information Technology (INSAIT), Karnataka
120. Jha, Madan Kumar, *Life Member* - Asian Association for Agricultural Engineering (AAAE), Thailand
121. Jha, Madan Kumar, *Life Member* - International Commission of Agricultural and Biosystems Engineering (CIGR)
122. Jha, Madan Kumar, *Fellow Member* - International Congress of Chemistry and Environment, M.P.
123. Das, Bhabani Sankar, *Member* - Indian Society of Soil Science
124. Pandey, Keshaw Prasad, *Member* - American Society of Agricultural and Biological Engineers
125. Pandey, Keshaw Prasad, *Life Member* - Indian Society of Agricultural Engineers
126. Pandey, Keshaw Prasad, *Member* - The Institution of Engineers (India)
127. Ghosh, Bijoy Chandra, *Life Member* - Indian Society of Weed Science
128. Ghosh, Bijoy Chandra, *Life Member* - Indian Society of Agronomy

### ***Member - Editorial Board***

1. Banerjee, Rintu (2014) *Editorial Board Member* - The Scientific World Journal
2. Bhadoria, P B Singh (0) *Member* - International Journal for Agricultural Research
3. Bhadoria, P B Singh (0) *Member* - Asian Journal of Earth Science
4. Das, Bhabani Sankar (0) *Associate Editor* - Agricultural Water Management
5. Das, Bhabani Sankar (0) *Member, Editorial Board* - Indian J. Agricultural Physics
6. Das, Madhusweta (0) *Member* - International Journal of Chemoinformatics and Chemical Engineering

7. Das, Madhusweta (2011) *Editor - Research and Reviews: Journal of Food Science and Technology*
8. Das, Madhusweta (2011) *Editor - Research and Reviews: Journal of Agricultural Science and Technology*
9. Dutta Gupta, Snehasish (2010) *Editorial board member - Functional Plant Science and Biotechnology*
10. Dutta Gupta, Snehasish (2010) *Editorial board member - Asian and Australian Journal of Plant Science and Biotechnology*
11. Dutta Gupta, Snehasish (2011) *Editorial Board Member - Journal of Biological Research (Hong Kong)*
12. Goswami, Tridib Kumar (0) *Editorial Board Member - The Standard International Journals (The SIJ)*
13. Guha, Proshanta (2011) *Member of Editorial Board - Research & Reviews: Journal of Agricultural Science and Technology*
14. Guha, Proshanta (2014) *Received invitation as Member of Editorial Board - Journal of Advance Research in Agriculture Science & Technology*
15. Guha, Proshanta (2011) *Member of Editorial Board - Research & Reviews: Journal of Food Science and Technology*
16. Jha, Madan Kumar (2004) *Editor - Research Journal of Chemistry and Environment*
17. Jha, Madan Kumar (2012) *Executive Editor-in-Chief - International Agricultural Engineering Journal*
18. Jha, Madan Kumar (2013) *Section Editor - Journal of Groundwater Research*
19. Jha, Madan Kumar (2010) *Editor - Journal of Water Resource and Protection*
20. Jha, Madan Kumar (2010) *Editor - Journal of Environmental Protection*
21. Jha, Madan Kumar (2012) *Associate Editor - Hydrogeology Journal*
22. Mailapalli, Damodhar Rao (2014) *Member - International Journal of Biomedical Science & Bioinformatics*
23. Mailapalli, Damodhar Rao (2012) *Editor - Journal of Water Resources and Protection*
24. Mishra, Hari Niwas (0) *Member - Food*
25. Mishra, Hari Niwas (0) *Member - Indian Food Industry*
26. Mishra, Hari Niwas (2012) *Member - International Journal of Food Science & Technology*
27. Mishra, Hari Niwas (2012) *Member - Focusing Modern Food Industry*
28. Mishra, Hari Niwas (2011) *Member - LWT - Food Science & Technology*
29. Mishra, Hari Niwas (0) *Member - Indian Food Packer*
30. Mishra, Hari Niwas (0) *Member - Journal of Food Science & Technology*
31. Mishra, Hari Niwas (0) *Member - Fresh Produce*
32. Mitra, Arunabha (2012) *Honorary Editor - Journal of Aquaculture in the Tropics*
33. Panda, Rabindra Kumar (2012) *Editorial Board Member - International Journal of Agricultural and Biological Engineering*
34. Panda, Sudhindra Nath (2013) *Reviewer - Water Science and Technology: Water Supply*
35. Panda, Sudhindra Nath (2014) *Reviewer - Agricultural Water Management*
36. Panda, Sudhindra Nath (2013) *Reviewer - Computers and Electronics in Agriculture*
37. Raghuwanshi, Narendra Singh (2002) *Advisory Editorial Board - Irrigation Science*
38. Shrivastava, Shanker Lal (2012) *Editor - American Journal of Food and Nutrition*
39. Srinivasa Rao, Pavuluri (2013) *Reviewer - Journal of Food Process Engineering*
40. Srinivasa Rao, Pavuluri (2014) *Reviewer - International Agricultural Engineering Journal*
41. Srinivasa Rao, Pavuluri (2012) *Reviewer - Food and Bioprocess Technology: An International Journal*
42. Tiwari, Kamlesh Narayan (2012) *Member Editorial Board from India - International Journal of Agricultural & Biological Engineering*

### ***Awards & Honours***

1. Mal, Bimal Chandra (2013) *Best Vice Chancellor of the Year Award by the Clinical Research Summit 2013*
2. Mitra, Adinpunya (2013) *DBT CREST Award*
3. Jha, Madan Kumar (2014) *Outstanding Book Award by the Indian Society of Agricultural Engineers, New Delhi*
4. Banerjee, Rintu (2014) *Received Most Inspiring women Engineer/Scientist for the year-2014, for the exemplary work in the field of Science & Technology by Engineering Watch, New Delhi.*
5. Banerjee, Rintu (2013) *Received Panjabrao Deshmukh Award for Outstanding Women Scientist 2012, from ICAR, New Delhi on 16th July 2013*
6. Das, Madhusweta (2013) *Second Best Prize on Poster Presented at the 3rd. International summit, ISPI 2013, Dec. 29-30, held at Hotel The Leela, Mumbai*
7. Srinivasa Rao, Pavuluri (2014) *Session Best Paper High pressure inactivation kinetics of Escherichia coli in black tiger shrimp (Penaeus Monodon)*

### ***Sponsored Research Projects***

1. Advanced Agro-techniques for Improving Productivity of Tea Garden (Tea Board, Govt. of India, Kolkata, Rs.12.48 Lakhs)
2. AICRP on Ergonomics & Safety in Agriculture (ICAR, New Delhi, Rs.126.24 Lakhs)
3. AICRP on Farm Implement and Machinery (ICAR, New Delhi, Rs.140.78 Lakhs)
4. AICRP on Post Harvest Technology (Indian Council of Agricultural Research, Rs.14.00 Lakhs)
5. Assessing the nitrogen fixing ability of cyanobacteria under the climate change scenarios for improving soil health (IIT Kharagpur, Rs.25.00 Lakhs)
6. Assessment of harvest and post harvest losses of major crops and commodities in India (ministry of Food Processing Industries, New Delhi, Rs.6.40 Lakhs)
7. Award of Fellowship under National Rebevable Fellowships (MNRE, Rs.61.76 Lakhs)
8. Bioactive peptide synthesis from honey protein and its biochemical characterization (CSIR, Rs.0.00 Lakhs)
9. Biodepolymerization of low grade lignite to Biomethane and Humic acid (ONGC, New Delhi, Rs.248.00 Lakhs)
10. Characterization of soil reflectance in the visible and near-infrared region for the iron-rich soils of eastern India (SERC, DST, New Delhi, Rs.19.65 Lakhs)
11. Climate Change Adaptations to Improve Agricultural Production in Eastern India (Sustainable Food Security) (MHRD, Department of Higher Education, New Delhi, Rs.18.85 Lakhs)
12. Climate change and rice-based crop production system of eastern and south eastern India: Impact assessment and risk management through simulation (C-MMACS, CSIR, Bangalore, Rs.16.67 Lakhs)
13. Design of drainage system and multi-purpose detention pond for storm water management of IIT Kharagpur campus (IIT Kharagpur, Rs.45.00 Lakhs)
14. Development of a conceptual water balance model for various ecosystems of India (Department of Space, SAC Ahmedabad, Rs.20.30 Lakhs)
15. Development of a GIS based decision support system for irrigation system management (Indian National Committee on Surface Water (INCSW), Ministry of Water Resources (MoWR), Rs.42.47 Lakhs)
16. Development of a Prototype for Continuous Production of Kheer (NDDB, Anand, Rs.6.25 Lakhs)
17. Development of Agricultural Machines (NIFP) (National Innovation Foundation, Ahmedabad, Rs.5.73 Lakhs)

18. Development of cage for mariculture through numerical & physical modeling (MOES. New Delhi, Rs.47.00 Lakhs)
19. Development of e-Courses for B.Tech. (Agricultural Engineering) (ICAR-NAIP (New Delhi), Rs.78.11 Lakhs)
20. Development of GIS based decision support system for irrigation system management (INCID, Min. of Water Resources, Govt. of India, Rs.42.47 Lakhs)
21. Development of low energy requiring tillage implements for tractors and power tillers (MHRD, Dept. of Higher Education, New Delhi, Rs.28.70 Lakhs)
22. Development of Process Technology for the Extraction and Purification of Ergothionein from Dried oyster Mushroom (*Pleurotus Ostreatus*)(PDO) (Department of Biotechnology, GOI, Rs.0.00 Lakhs)
23. Development of Quality Control and Management System & Protocols for Stored Food Grains (MHRD, Department of Higher Education, New Delhi, Rs.61.20 Lakhs)
24. Development of Solar Assisted Vapour Absorption Refrigeration System for Rural storage Needs (IIT Kharagpur, Rs.1.00 Lakhs)
25. Development of storage technologies for improved food grain storage (MHRD, Department of Higher Education, New Delhi, Rs.40.65 Lakhs)
26. Development of Technology and Prototype Facility for Enhancement of Shelf life of Fruits and vegetables through Active Packaging and Modified Storage (Department of Biotechnology, Govt of India, Rs.89.00 Lakhs)
27. Development of Technology for processing and preservation of ripe Palmyra Palm fruits (ICAR, Rs.23.00 Lakhs)
28. Enhancing Research Capacity and Initiating Integrated M Tech & Ph D programme in Food Science & Technology (Department of Biotechnology, Government of India , New Delhi, Rs.837.80 Lakhs)
29. Ensemble modeling of rainfall-runoff transformation process (Ministry of Water Resources, Rs.26.50 Lakhs)
30. Enzymatic approach to control celiac disease to an alternative treatment strategy (Department of Biotechnology, GOI, Rs.0.00 Lakhs)
31. Estimation of crop coefficients from remotely sensed data to improve irrigation scheduling in India (Under Sustainable Food Security Project) (Ministry of Human Resources Development (MHRD), Rs.30.50 Lakhs)
32. Experimental Agro-meteorological Advisory Service unit (AAS) (Ministry of Earth Science, Government of India, India Meteorological Department, Mausam Bhawan, Lodh, Rs.0.00 Lakhs)
33. Food Security Research (MHRD, Rs.200.00 Lakhs)
34. Forecasting Agricultural output using Space, Agrometeorology and Land based Observations (Ministry of Earth Sciences, Rs.12.00 Lakhs)
35. Formulation and Pilot Scale Unit for Production of Therapeutic Food in Ready-to-Eat Form (TF-RTE) for Management of SAM Children (Department of Biotechnology, Govt of India and M/s GCPL New Delhi, Rs.218.70 Lakhs)
36. Geophysical and Hydrogeologic Characterization of Aquifers and Artificial Recharge of Groundwater at IIT Kharagpur Campus for Sustainable Water Supply (MHRD, Rs.100.00 Lakhs)
37. Implementation of Agro-techniques towards recovery of lost soil fertility to salinity after Aila incidence in Dayapur, island of Sunderban areas: An i (NABARD, Kolkata, Rs.9.00 Lakhs)
38. Improving Groundwater Levels and Quality through Enhanced Water Use Efficiency in Eastern India Agriculture (Information Technology Research Academy (ITRA), Ministry of Communication and Information Technology, Rs.114.41 Lakhs)
39. Indo-Denmark Collaborative research project on High rate algal biomass for food, feed and bioenergy (DBT, GOI, Rs.0.00 Lakhs)
40. Integrated Agromet Advisory Services (Ministry of Earth Sciences, Govt. of India, Rs.30.00 Lakhs)

41. Integrated pilot project on food grain production and post-harvest processing and storage at farm level (MHRD, DEPARTMENT OF HIGHER EDUCATION, Govt. of India, Rs.186.30 Lakhs)
42. Integration of rain water harvesting and climate resilient agriculture in sustaining productivity and profitability of rainfed agroclimatic zones of e (ICAR, CRIDA, NICRA, Hyderabad, Rs.0.00 Lakhs)
43. Interdisciplinary network for holistic environment system analysis, eco-system services, integrated modelling and sustainable resources management (BMBF, Germany, Rs.264.00 Lakhs)
44. Investigation of Groundwater Dynamics and Recharge Potential under Salient Crop Production Systems of Eastern India (MHRD, Rs.33.10 Lakhs)
45. Kheer Making (NDDDB, Rs.6.25 Lakhs)
46. Land use land cover dynamics in relation to human dimension and climate in Mahanadi river basin, Orissa (NRSC, Hyderabad, Rs.22.80 Lakhs)
47. Measurement to management (M2M): Improved water use efficiency and agricultural productivity through experimental sensor network (MoIT, Information Technology Research Academy (ITRA), Rs.155.64 Lakhs)
48. Modeling the performance of a few major cropping systems in eastern India in the light of projected climate change (National Agricultural Innovation Project, ICAR, New Delhi, Rs.50.00 Lakhs)
49. NAIP project entitled "Precision Farming Technologies ..... in Production Agriculture" (ICAR, New Delhi, Rs.59.74 Lakhs)
50. Operational Research Project on Agro-processing centre (ICAR, New Delhi, Rs.5.54 Lakhs)
51. Perturbing phenolic natural product metabolism in tobacco by expressing a cryptogein gene of novel elicitor function (DST-SERB, New Delhi, Rs.34.50 Lakhs)
52. Power generation with reduced emissions using de-oiled cake and biodiesel from non-edible oil seeds (Department of Science & Technology, Rs.33.07 Lakhs)
53. Precision Farming Development Centre (National Committee on Plastics Application in Horticulture, Min. of Agriculture, Govt. of India, Rs.250.00 Lakhs)
54. Precision Farming Technologies based on Microprocessor & Decision Support Systems for Enhancing Input Application Efficiency in Production Agriculture (ICAR, NAIP, Rs.46.49 Lakhs)
55. Production of Citrus Juice through enzymatic debittering (DBT, Rs.0.00 Lakhs)
56. Production of ethanol from lignocellulosics: Lab to Pilot scale (DBT, Rs.345.00 Lakhs)
57. Rapid soil carbon mapping using soil reflectance in the visible and near-infrared region (NRDMS, DST, New Delhi, Rs.60.00 Lakhs)
58. Rural Technology Action Group (Office of Principal Advisor to Prime Minister, Rs.6.00 Lakhs)
59. Seed drill with flow detecting sensors (MHRD, Dept. of Higher Education, New Delhi, Rs.13.60 Lakhs)
60. Standardization of process parameters in withering, maceration, rolling, fermentation and drying of tea (Tea Board, Govt. of India, Kolkata, Rs.366.96 Lakhs)
61. Studies on High Pressure Processing of High Value Perishables (NAIP, Indian Council of Agricultural Research (ICAR), New Delhi, Rs.465.00 Lakhs)
62. Studies on Microalgal Triacylglycerols as a Source of Biodiesel (ICAR, Rs.170.29 Lakhs)
63. Study of heat and mass transfer and estimation of CO<sub>2</sub> mitigation during solar drying of food products (ISIRD, SRIC, Rs.4.87 Lakhs)
64. Survey to Identify the Practices for Ripening of Fruits (ICAR-ICMR, Rs.0.00 Lakhs)
65. Sustainable Food Security through Technological Interventions for Production, Processing and Logistics (SAL) (MHRD, Rs.2600.00 Lakhs)
66. Synthesis and characterization of green silver nano from medicinal plants for surface sterilization of Mango: an indigenous fruit of West Bengal. (CSIR, Rs.0.00 Lakhs)
67. Targeted metabolomics-based selection of superior scented rice cultivars appropriate for growing in local agro-climatic zones (Department of Higher Education, MHRD, New Delhi, Rs.100.00 Lakhs)

68. Understanding scent volatiles emission in Polianthes tuberosa flowers (CSIR, New Delhi, Rs.25.00 Lakhs)
69. Upgradation of laboratory and library facilities for renewable energy programme (MNRE, Rs.50.00 Lakhs)

### ***Consultancy Projects***

1. Construction of periphery road in the BRBNMPL campus (Bharatiya Reserve Bank Note Mudran Ltd., Salboni, Rs.10.00 Lakhs)
2. Evaluation of Antioxidant Potential, Synergistic Behaviour and Stability of Rosemary & Sage Extracts (M/s Synthite Industries Ltd., Kolenchery, Kerala, Rs.49.90 Lakhs)
3. Evaluation of capacity of Rice Mill at Midnapur (Rice Millers' Association, Rs.0.00 Lakhs)
4. Evaluation of Probable Maximum Flood for Nagarjun Sagar Dam (Irrigation and CAD Department, Govt. of Andhra Pradesh, Rs.29.00 Lakhs)
5. Multipurpose cold storage (MRCS) (M/s Greenfield Wintrade Pvt Ltd. Kolkata, Rs.3.25 Lakhs)
6. Performance Evaluation of Agricultural Machines (PEAM) (M/s Vijay Engineering and Machinery Co., Laxmipuri, Kolhapur - 416002, Maharashtra, Rs.1.45 Lakhs)
7. Performance evaluation of Texas Alligator (PETA) (M/s Texas Farm & Garden Technologies Pvt. Ltd., Pace City, Sector 37, Gurgaon 122001, Haryana, Rs.0.35 Lakhs)
8. Performance of a bias-ply tyre (PBPT) (TVS Tyres Ltd, Madurai, Rs.5.52 Lakhs)
9. Planning and Design of Rainwater Harvesting Systems for Cement Grinding Unit in Purulia-West Bengal (Reliance Cement Company Pvt. Ltd. Mumbai, Rs.4.91 Lakhs)
10. Preservation of fresh betel leaves cultivated in and around Midnapore District (Private party (Sri Krishna Cold Storage, Nonakuri Bazaar, East Midnapore, WB), Rs.0.22 Lakhs)
11. Rainwater Harvesting at Arati Steel Ltd. (Arati Steel Ltd., Cuttack, Rs.4.20 Lakhs)
12. Rainwater Harvesting at Bokaro Steel Ltd. (Bokaro Steel Ltd., SAIL, Rs.7.50 Lakhs)
13. Rainwater Harvesting in the UAL Bengal Campus (UAL Bengal, Rs.2.00 Lakhs)
14. Study of effect of mining activities on water quality in surrounding areas (Tata Steel, Noamundi, Rs.15.00 Lakhs)
15. Technology for extraction of essential oil from Betel Leaf (TEBL) (Private party: Md. Rafique Md. Yaqub, Sadi Wada Infront of School No.1, Ward No.15, Deulgaon Raja-4432, Rs.30000.00 Lakhs)
16. Testing of Brush Cutters (TTBC) (M/s Texas Farm & Garden Technologies Pvt. Ltd., Pace City, Sector 37, Gurgaon 122001, Haryana, Rs.0.78 Lakhs)
17. Testing of Green Field Equipments (TGFE) (M/s Green Field Material Handling Pvt. Ltd. Manish Nagar, Thane, Maharashtra 400605, Rs.0.72 Lakhs)
18. Testing of Rice Mills (TTRM) (B K Agro Products Pvt Ltd, Rs.0.10 Lakhs)
19. Testing of TATA Power Weeders and Tillers (TTPW) (M/s Texas Farm & Garden Technologies Pvt. Ltd., Pace City, Sector 37, Gurgaon 122001, Haryana, Rs.2.54 Lakhs)
20. Testing of Texas Tiller (TGTT) (M/s Texas Farm & Garden Technologies Pvt. Ltd., Gurgaon, Haryana, Rs.1.55 Lakhs)
21. TPIA for Creation of Teaching Labs for NIFTEM (Ministry of Food Processing Industries, Govt of India, Rs.13.80 Lakhs)
22. Tractive performance of bias-ply and radial-ply tyres (Apollo Tyres Ltd, Vadodara, Rs.19.85 Lakhs)
23. Vermicomposting (Greenfield Agrotech, Rs.0.25 Lakhs)

### ***Technology Transferred***

1. NGOs - An Improved Pedal driven Sabai Grass Rope Making Machine : Rs. 0.00 Lakh
2. NGOs - Bamboo Sliver Making Machine : Rs. 0.00 Lakh
3. NGOs - Coir Rope Doormat Making Machine : Rs. 0.00 Lakh



4. Purvachal Kalyan Aashram (NGO) - Design and construction of on-farm pond in rainfed districts of West Bengal : Rs. 0.00 Lakh
5. NGOs - Dual Fibre Extractor Machine : Rs. 0.00 Lakh
6. M/s G C P L, New Delhi - Formulation and Process Technology for Production of Ready-to-Eat Therapeutic Food For Management of SAM children : Rs. 0.00 Lakh
7. NGO-Keshiary - Integrated Muri Making machine : Rs. 0.00 Lakh
8. NGOs - Leg Operated Jute Rope Making Machine : Rs. 0.00 Lakh
9. Department of Horticulture, Min. of Food Processing & Horti. Govt. of West Bengal - Micro Irrigation and Greenhouse Structures Design for Horticultural Crops : Rs. 0.00 Lakh
10. NGOs, SHG of Nayagram - Muri Making Machine (Hand-operated) : Rs. 0.00 Lakh
11. NGOs - Sabai Grass Rope Polishing Machine : Rs. 0.00 Lakh
12. NGOs - Sisal Fibre Extractor : Rs. 0.00 Lakh

***Patents (filed / granted)***

1. A spoon feed type of seed metering mechanism
2. An edible film from Soy Whey and a process for the Preparation.
3. Biodepolymerization of humic acid from lignite
4. Coir Rope Doormat Making Machine
5. Continuous Soil Moisture Recorder
6. Development of a novel anaerobic consortium for biomethane production from lignite
7. Dual Fiber (Ramie-Sisal) Extractor
8. Enzymatic peeling of potatoes
9. Enzymatic saccharification and fermentation of pretreated lignocellulosic raw material
10. Flow Regulated Drip Emitter
11. Formulation and Process Technology for Production of Ready-to-Eat Therapeutic Food For Management of SAM children
12. Grain puffing cum roasting machine
13. Granular Matrix Soil Moisture Sensor
14. High Pressure Pasteurization of Mango Juice
15. High Pressure Pasteurized Litchi Juice
16. In situ aquaculture water remediation using sediment microbial fuel cell
17. Integrated Composite Anthropometer
18. Integrated Muri (Puffed Rice) Making Machine
19. Jamun fruit extraction machine
20. Mechanical loading-unloading and uniform spreading system for tea leaf on withering trough
21. Motorized Jute Rope Making Machine (Model 2)
22. Motorized Rice Pounder – Horizontal Type
23. Production of bioethanol from potato waste
24. Purification of lactic acid and its polymerisation to Polylactic acid (PLA) with improved property.
25. Single screw extruder for third generation snacks
26. Strategic enhancement of lignite biomethanation by fungal pretreatment
27. Sun tracking solar dryer
28. Sweat Irrigation System
29. Tea maceration machine

**Visits Abroad by Faculty Members**

1. Tiwari, Kamlesh Narayan - International training on Distance education methods and e-learning tools (Department of Agricultural & Biosystem Engineering, North Dakota State University, Fargo, North Dakota, USA, ) May 27 2013 to June 09, 2013.
2. Tiwari, Kamlesh Narayan - Advanced Labs visit and to establish reseach linkage. (University of Guelph, Canada, ) June 15 2013 to June 18, 2013

3. Srinivasa Rao, Pavuluri - Presenting a paper at International conference (IICBE) (Dubai, UAE, ) 2 days 17-18 March 2014
4. Srivastav, Prem Prakash - To present a paper in IFT 2013 Annual Meeting (Chicago, IL, USA, ) July 13 - 16, 2013
5. Srivastav, Prem Prakash - To deliver a lecture and interact with doctoral graduate students (South Dakota State University, Brookings, USA, ) July 18 - 20, 2013
6. Srivastav, Prem Prakash - To present papers in 2013 ASABE Annual International Meeting (Kansas City, Missouri, USA, ) July 21 – 24, 2013
7. Mishra, Ashok - To attend Asia-Pacific International Congress on Engineering & Natural Sciences 2013 (APICENS-2013) (Bangkok, Thailand, ) 16-18 April, 2013
8. Raheman, Hifjir - For attending international conference (Dubai, ) 17-18th March 2014
9. Swain, Dillip Kumar - To deliver lecture at UNUN, Tokyo (Japan, ) 20-22 October 2013
10. Panda, Sudhindra Nath - As Visiting Professor: Hydrology and Sustainable Water Resources Management of Arid Environments (Arid Land Research Center, Tottori University, Tottori, Japan, ) 1st April, 2013 to 31st March, 2014 (one-year)
11. Mal, Bimal Chandra - To participate in the Vice Chancellors Conference and present a paper (Istanbul, ) 4 days
12. Mal, Bimal Chandra - To present 2 papers, to chair 3 technical sessions and to take part in Rectors Forum meeting. (Cape Town, ) 5 days

#### **Invited Lectures by Faculty Members**

1. Climate change impacts on food security *by* Swain, Dillip Kumar (United Nations University, Tokyo, JAPAN)
2. Toxicity and product safety of oils and fats *by* Das, Madhusweta (varanasi)
3. Rainwater Harvesting and Artificial Groundwater Recharge: Emerging Tools for Mine Site Restoration *by* Jha, Madan Kumar (Department of Mining Engineering, Indian Institute of Technology Kharagpur)
4. Digital soil mapping *by* Das, Bhabani Sankar (Bengaluru)
5. Biophysical Characterization and Various Measurement Techniques for Quantifying Ecosystem Services *by* Das, Bhabani Sankar (ICRISAT, Hyderabad)
6. Microwave-convectional drying of oyster mushroom *by* Srivastav, Prem Prakash (South Dakota State University, Brookings, USA)
7. Aquaculture - Social Issues *by* Mitra, Arunabha (Expert Body on Water Resilience Central Institute of Freshwater Aquaculture(ICAR), Bhubaneswar)
8. Metabolic phytochemistry-based approaches for studying secondary pathways in hairy root cultures *by* Mitra, Adinpunya (Indian Institute of Science Education & Research Pune)
9. High pressure processing of perishable fruits *by* Srinivasa Rao, Pavuluri (Anand Agricultural University, Gujarat)
10. “Food quality measurement - A key factor in consumer acceptability: Sensory versus objective methods *by* Das, Susanta Kumar (IIT-BHU)
11. Experiences with microalgal biodiesel production *by* Mallick, Nirupama (Visva-Bharati, Santiniketan)
12. High pressure processing of fruits and fruits products. *by* Srinivasa Rao, Pavuluri (Central Institute of Fisheries Technology Cochin)
13. High pressure processing of perishable foods *by* Srinivasa Rao, Pavuluri (A D Patel Institute Technology, Anand, Gujarat)
14. Continuous operation of milk sterilizer based on control algorithm application *by* Datta, Ashis Kumar (Chennai, India)
15. Effect of Greenhouse Shapes and Cladding Materials on Micro Climate for Vegetable and Flower Product *by* Tiwari, Kamlesh Narayan (College of Agricultural Engineering & Technology MPUA&T, Udaipur)
16. Economic Analysis of Micro-irrigation in Fruits and Vegetable Crops *by* Tiwari, Kamlesh Narayan (CISH (ICAR) Lucknow)

17. Water for Agriculture in Eastern India *by* Panda, Sudhindra Nath (Faculty of Agriculture, Tottori University, Tottori, Japan)
18. Integrated Land and Water Resources Planning and Management in Semi-arid Regions of North-west India *by* Panda, Sudhindra Nath (Arid Land Research Center, Tottori, Japan)
19. Simulation-Optimization Modelling for Integrated Land and Water Resources Management in India *by* Panda, Sudhindra Nath (International Research Centre for River Basin Environment, Univ. of Yamanashi, Yamanashi, Japan)
20. Water Conservation and Reuse for Climate Resilient Sustainable Rainfed Agriculture in Eastern India *by* Panda, Sudhindra Nath (Laboratory of Regional Planning, Graduate School of Global Environmental Studies, Kyoto University, Japan)
21. Rainwater Conservation and Reuse for Sustainable Agriculture in Rainfed Ecosystem of Eastern India *by* Panda, Sudhindra Nath (ALRC, Tottori University, Tottori, Japan)
22. Development of Pooled Circular Stepped Cascade Aeration System for Water Treatment *by* Mal, Bimal Chandra (Rungta College of Engineering and Technology, Bilhail)
23. Roadmap for Upgradation of Technical Education in Chhattisgarh *by* Mal, Bimal Chandra (Istanbul)
24. Technological Options for Rural Development of Chhattisgarh *by* Mal, Bimal Chandra (Bastar University, Jagdalpur)
25. Importance of Human Values in Technical Education *by* Mal, Bimal Chandra (O.P. Jindal Institute of Technology, Raigarh)
26. Vocational Training, Skill Development and Entrepreneurship *by* Mal, Bimal Chandra (National Institute of Technical Teachers Training and Research (NITTTR), Bhopal)
27. Common Mistakes in Writing Ph.D. Thesis and Remedial Measures *by* Mal, Bimal Chandra (Ravishankar Shukla University, Raipur)
28. e-Governance for Universities *by* Mal, Bimal Chandra (New Delhi on U.N. Public Service Day)

#### ***Short-Term Courses, Training Programmes and Workshops organised***

1. CII-IIT Certified Food Professional Course on Food Safety & Quality Management (2 weeks)
2. Farmers Field Day, Bishnupur, Bankura (September 25, 2013)
3. Food Processing & Preservation – Food Grains / Fruit-Vegetable Processing (January 20-22, 2014)
4. Greenhouse Management and Plasticulture in Horticulture (September 30-October 1, 2013)
5. Micro-irrigation and Plasticulture Technologies for Horticultural Crops (May 25-26, 2013)
6. On-site waste water treatment and management (June 31 to July 11, 2014)
7. Plasticulture Applications in Horticultural crops (April 25-26, 2013)
8. Precision Farming in Horticulture (December 16-17, 2013)
9. Protected Cultivation Technology (October 22-23, 2013)
10. Scope of Greenhouse and Plasticulture in Horticulture (January 16-17, 2014)

#### ***Papers Published in Journals***

1. A comprehensive study on enhanced characteristics of modified polylactic acid based versatile biopolymer, *By* Bishai M, De S, Adhikari B and Banerjee R, *European Polymer Journal*, 54, 52-61. (2014)
2. Biomethanation of pineapple wastes using potent anaerobic consortia substituting cow manure. *By* Mukesh Y, Jacob SB, Lakshmishri U and Banerjee R, *Environmental Engineering and Management Journal* in press (2014)
3. Comparative pretreatment method for efficient enzymatic hydrolysis of *Salvinia cucullata* and sewage treatment in ponds containing this biomass. *By* Mishra GS, Mitra A, Banerjee R and Ghangrekar MM *Clean Technologies and Environmental Policy*, 1-8 (2013)
4. Enhanced lipase recovery through RSM integrated differential evolutionary approach from the fermented biomass *By* Garlapati VK and Banerjee R, *Brazilian Archives of Biology and Technology* 56(5), 699-709 (2013)

5. Lipase mediated transesterification of Simarouba glauca oil: A new feedstock for Biodiesel production, , By Garlapati VK, Ravi K, Kumari A, Mahapatra P and Banerjee R, *Sustainable Chemical Processes* 1(11), 1-6 (2013)
6. (2014) Production of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) co-polymer by the diazotrophic cyanobacterium *Aulosira fertilissima* CCC 444. By Samantaray, S. and Mallick, N. *Journal of Applied Phycology* 26: 237-245. (2014)
7. A combined bottom-up and top-down approach for assessment of climate change adaptation options. By Bhawe, A, Mishra, A. and Raghuvanshi, N. S. *J. of Hydrology* DOI: 10.1016/j.hydro (2013)
8. A computer model for designing of permanent gully control structures By Khalkho, D., Raghuvanshi, N. S., Khalkho, S., and Singh, R *African JI of Agril. Res.* 8(29):3860-3872 (2013)
9. A Gap Analysis on Research in Higher Education Institutions for Sustainable Development By M. K. Kowar and B. C. Mal *University News.* 51(17): 35-38. (2013)
10. A panoptic study of antioxidant potential of foliar gel at different harvesting regimens of *Aloe vera* L. By A. Roy and S. Dutta Gupta *Industrial Crops & Products* 51: 130-137 (2013)
11. A review of different methods for chlorophyll estimation. By Dey, A.K., Sharma, M. and P. Guha *Global Journal of Engineering & applied sciences (ISSN 2249-2623)* 3(4):188-193. (2013)
12. Analysis of spatial variation of groundwater depths using geostatistical modeling By Sahoo, S. and Jha, M.K. *International Journal of Applied Engineering Research* 9(3): 317-322 (2014)
13. Antioxidant Activity: An Overview By Sneha Sehwa and Madhusweta Das *Research & Reviews : Journal of Food Science & Technology* 2(3), 1-10 (2013)
14. Antioxidant capacities and acetylcholinesterase-inhibitory activity of *Hoppea fastigiata* By Utkarsh R Moon, Sukanta K Sen and Adinpunya Mitra *Journal of Herbs, Spices & Medicinal Plants* 20: 115-123 (2014)
15. Application of decolorized and partially purified polygalacturonase and  $\alpha$ -amylase in apple juice clarification By Bhanja Dey T and Banerjee R, *Brazilian Journal of Microbiology* in press (2014)
16. Application of genetic algorithm technique to inverse modeling of tide-aquifer interaction By Jha, M.K. and Singh, A. *Environmental Earth Sciences* 71(8): 3655-3672 (2014)
17. Application of High Hydrostatic Pressure as a Pretreatment for Osmotic Dehydration of Banana Slices (*Musa cavendishii*) Finish-Dried by Dehumidified Air Drying By Deepank Verma, Neelima Kaushik & P. Srinivasa Rao *Food Bioprocess Technology* DOI 10.1007/s11947-0 (2013)
18. Application of high pressure processing for shelf life extension of litchi fruits (*Litchi chinensis* cv. Bombai) during refrigerated storage By Neelima Kaushik, Barjinder Pal Kaur P. Srinivasa Rao *Food Science and Technology International* DOI: 10.1177/1082013 (2013)
19. Application of hybrid neural network in modeling water table fluctuations By Sahoo, S. and Jha, M.K. *Journal of Groundwater Research* 2(1): 9-19 (2013)
20. Application of sediment microbial fuel cell for in situ reclamation of aquaculture pond water quality By Sajana, T.K., Ghangrekar, M.M. and Mitra, A. *Aquacultural Engineering* 57, 101- 107. (2013)
21. Artificial groundwater recharge zones mapping using remote sensing and GIS: A Case study in Indian Punjab By Singh, Amanpreet, Panda, S.N., Kumar, K.S. and Sharma, C.S. *Environmental Management* 52(1): 61-71 (2013)
22. Assessing biochemical changes during standardization of fermentation time and temperature for manufacturing quality black tea By Tanmoy Samanta, Vijay Kumar Cheeni, Shrikleha Das, Amrita Basu Roy, Bijoy Chandra Ghosh and Adinpunya Mitra *Journal of Food Science & Technology* In press (2014)
23. Assessing future changes in seasonal climatic extremes in the Ganges river basin using an ensemble of regional climate models By Neha Mittal, Ashok Mishra, Rajendra Singh, Pankaj Kumar *Climatic Change* 123(2):273-286 (2014)

24. Auto updating wavelet based MLR models for monsoonal river discharge forecasting By Sehgal, V., and Chatterjee, C. *International Journal of Civil Engineering Research* 5(4), 401-406 (2014)
25. Biochemical characterisation of a newly isolated low molecular weight lipase from *Rhizopus oryzae* NRRL 3562. By Adak S, and Banerjee R, *Enzyme Engineering* 2:118. (2013)
26. Characterizing rainfall-groundwater dynamics in a hard-rock aquifer system using time series, geographic information system and geostatistical modeling By Machiwal, D. and Jha, M.K. *Hydrological Processes* 28(5): 2824-2843 (2014)
27. Chemometric studies on mineral distribution and microstructure analysis freeze dried Aloe vera L. gel at different harvesting regimens By A. Roy, S. Dutta Gupta, S. Ghosh, S.M.Awastha, and B. Kabi *Industrial Crops & Products* 51: 194-201 (2013)
28. Chilled storage of high pressure processed black tiger shrimp (*Penaeus monodon*) By Barjinder Pal Kaur, Neelima Kaushik, P. Srinivasa Rao and H.N. Mishra *Journal of Aquatic Food Product Technology* DOI: 10.1080/1049885 (2013)
29. Combating photooxidative stress in green hairy roots of *Daucus carota* cultivated under light irradiation By Chiranjit Mukherjee, Debabrata Sircar, Moniya Chatterjee, Sampa Das and Adinpunya Mitra *Journal of Plant Physiology* 171: 179-187 (2014)
30. Combination Tillage Implement for High Horse Power 2WD Tractors By Raheman H., Roul, A. K. *Agricultural Mechanization in Asia, Africa and Latin America (AMA), Japan*, 44(3):75-79 (2013)
31. Combining climatological and participatory approaches for assessing changes in extreme climatic indices at regional scale By Neha Miital, Ashok Mishra, R. Singh *Climate Change* (2013)
32. Combustion and Performance of a diesel engine with preheated *Jatropha Curcas* oil using waste heat from exhaust gas. By Pradhan P., Raheman, H. *Journal of Fuel* 115: 527-533 (2013)
33. Comparative analysis of solid-state bioprocessing and enzymatic treatment of finger millet for mobilization of bound phenolics By Yadav G., Singh A., Bhattacharya P., Yuvraj J and Banerjee R, *Bioprocess and Biosystems Engineering*, 36(11), 1563-1569 (2013)
34. Comparative assessment of conventional and organic nutrient management on crop growth and yield and soil fertility in tomato-sweet corn production system By Murmu K., Swain D. K., and Ghosh B. C. *Australian Journal of Crop Science* 7(11):1617-1626 (2013)
35. Comparative assessment of various lipid extraction protocols and optimization of transesterification process for microalgal biodiesel production. By Mandal, S., Patnaik, R., Singh, A.K. and Mallick, N. *Environmental Technology* 34: 2009-2018. (2013)
36. Comparative evaluation of numerical model and artificial neural network for simulating groundwater flow in Kathajodi–Surua Inter-basin of Odisha, India By Mohanty, S., Jha, M.K., Kumar, A. and Panda, D.K. *Journal of Hydrology* 495: 38-51 (2013)
37. Comparative pretreatment method for efficient enzymatic hydrolysis of *Salvinia cucullata* and sewage treatment in ponds containing this biomass By • Mishra, G.S., Mitra, A., Banerjee, R., Ghangrekar, M.M. *Clean Technologies and Environmental Policy* DOI 10.1007/s10098-0 (2013)
38. Copolymerization of lactic acid for cost-effective PLA synthesis and studies on its improved characteristics, By Bishai M, De S, Adhikari B and Banerjee R, *Food Science and Biotechnology*, 22(1), 73-77 (2013)
39. Design aspects and laboratory simulation study of a floating marine fish cage prototype with mooring system By VA Sadhan et al *Indian journal of Fisheries* 61(4):26-30 (2014)
40. Design Characteristics of Pooled Circular Stepped Cascade Aeration System By A., Kumar, S. Moulick, B.K. Singh and B. C. Mal *Aquacultural Engineering* 56: 51-58 (2013)
41. Determination of Convective Heat Transfer Coefficient and Specific Energy Consumption of Potato using an Ingenious Self Tracking Solar Dryer By Tripathy, P.P., Abhishek, S., Bhadoria, P.B.S. *Food Measure* DOI 10.1007/s11694-0 (2013)
42. Development of a user friendly water balance model for paddy By A. Bhadra, A. Bandyopadhyay, R. Singh, N. S. Raghuwanshi *Paddy Water Environment* 11, 331-341 (2013)

43. Development of surface irrigation system design and evaluations software By Adamala, S., Raghuwanshi, N. S., and Mishra, A. *Jl. of Computers and Electronics in Agriculture* 100:100-109 (2013)
44. Diffuse Reflectance Spectroscopic Approach for the Characterization of Soil Aggregate Size Distribution By Sarathjith, M. C., B. S. Das, H. V. Vasava, B. Mohanty, S. S. Anand, S. P. Wani, and K. L. Sahrawat *Soil Sci. Soc. Am. J.* Accepted (2014)
45. Discrete Wavelet Transform Approach for the Estimation of Crop Residue Content from Spectral Reflectance By Anand, S. S., P. Shrivastava, B. S. Das, and M. C. Sarathjith *IEEE, Journal of Selected Topics in Applied Earth Observations and Remote Sensing* 10.1109/JSTARS.2013. (2014)
46. Effect of Antimicrobial on Mechanical, Barrier and Optical Properties of Corn Starch Based Self-Supporting Edible Film By Tanima Chowdhury and Madhusweta Das *International Journal of Food Studies* 2, 212-223 (2013)
47. Effect of elevated carbon dioxide and nitrogen management on rice milling qualities By Satapathy, S.S., Swain, D.K., Shrivastava, S.L., Bhadoria, P.B.S. *Eur. Food Res. Technol.* DOI 10.1007/s00217-0 (2014)
48. Effect of exhaust back pressure on noise characteristic of tractor mufflers By Shrivastava, Ashish Kumar, Tewari, V K and Santosh K. *AMA* Vol. 45(1): 79-83 (2014)
49. Effect of fluidized bed heat treatment on insect mortality, proximate composition and antinutritional content of stored green gram (*Vigna radiata*) seeds By Ranjana Pande., HN Mishra. *Journal of Food Chemistry and Nutrition*, 01 (02): 94-99 (2013)
50. Effect of high pressure processing on color, biochemical and microbiological characteristics of mango pulp (*Mangifera indica* cv. Amrapali). By Neelima Kaushik, Barjinder Pal Kaur, P. Srinivasa Rao, H. N. Mishra *Innovative Food Science & Emerging Technologies* 22: 40-50 (2014)
51. Effect of Mycorrhizal Infection on Phosphorus Efficiency of Maize (*Zea mays* L.) Cultivars. By Gill, A. A. S, Bhadoria, P.B.S., Sadana U. S *Proceedings of the National Academy of Sciences, India, Sect. B Biol. Sci.* DOI 10.1007/s40011-0 (2013)
52. Effect of pH and distance between electrodes on the performance of sediment microbial fuel cell. By Sajana, T.K., Ghangrekar, M.M. and Mitra, A. *Water Science and Technology* 68 (3), 537-543 (2013)
53. Effect of presence of cellulose in the freshwater sediment on the performance of sediment microbial fuel cell. By Sajana, T.K., Ghangrekar, M.M. and Mitra, A. *Bioresource Technology* doi.org/10.1016/j.bi (2013)
54. Effect of synbiotic interaction of fructooligosaccharide and probiotics on the acidification profile, textural and rheological characteristics of fermented soy milk. By Shalini Mishra and H N Mishra *Food Bioprocess Technology* (2013)
55. Effect of utilization of discrete wavelet components on flood forecasting performance of wavelet based ANFIS models By Sehgal, V., Sahay, R. R., and Chatterjee, C. *Water Resources Management*, DOI 10.1007/s11269-014-0584-4 (2014)
56. Effects of calcium, magnesium and sodium chloride in enhancing lipid accumulation in two green microalgae. By Gorain, P.C., Bagchi, S.K. and Mallick, N. *Environmental Technology* 34: 1887-1894. (2013)
57. Electronic Nose Based On Metal Oxide Semiconductor Sensors as an Alternative Technique for the Spoilage Classification of Oat Milk. By Deswal, A., N. S. Deora, and H. N. Mishra. *International Journal of Electrical, Electronic Science and Engineering* 8(3) (2014)
58. Engineering innovation in developing rural load carrier operated jute seed drill for farm workers By Chandel Narendra Singh, Tewari, V K and Vidhu K P *African Journal of Agricultural Research* Vol. 9(8), 797-805 (2014)
59. Evaluating tyrosinase (monophenolase) inhibitory activity from fragrant roots of *Hemidesmus indicus* for potent use in herbal products By Anish Kundu and Adinpunya Mitra *Industrial Crops and Products* 52: 394-399 (2014)
60. Evaluation of antioxidative activity and UV –absorption potential of the extract of Aloe vera L. gel from different growth periods of plants By A. Roy, S. Dutta Gupta, and S. Ghosh *Industrial Crops & Products* 49: 712-719 (2013)

61. Evaluation of hydrological effect of stakeholder prioritized climate change adaptation options based on multi-model regional climate projections By Ajay Gajanan Bhawe, Ashok Mishra, Narendra Singh Raghuwanshi *Climatic Change* 123(2):225-239 (2014)
62. Evaluation of TRMM rainfall estimates over a large Indian river basin (Mahanadi) By Kneis, D., Chatterjee, C., and Singh, R. *Hydrology and Earth System Sciences Discussion* 11, 1169-1201 (2014)
63. Evapotranspiration modeling using second order neural networks. By Adamala, S., Raghuwanshi, N. S., Mishra, A., and Tiwari, M. *Jl. of Hydrol. Engrg.*, doi:10.1061/(ASCE)HE (2013)
64. Fermentation of vegetable juice mixture by probiotic lactic acid bacteria By Sharma V, Mishra HN *Nutrafoods* 12: 17-22 (2013)
65. Fermented milks and milk products as functional foods—A review By Shiby, V. K., and Mishra, H. N. *Critical Reviews in Food Science and Nutrition* 53(5): 482-496 (2013)
66. Field experiments and simulation to evaluate rice cultivar adaptation to elevated carbon dioxide and temperature in sub-tropical India By Satapathy S.S., Swain D. K., and Herath S. *European Journal of Agronomy* 54:21-33 (2014)
67. Flavoring extracts of *Hemidesmus indicus* roots and *Vanilla planifolia* pods exhibit in vitro acetylcholinesterase inhibitory activities By Anish Kundu and Adinpunya Mitra *Plant Foods for Human Nutrition* 68: 247-253 (2013)
68. Flood hazard assessment with multi-parameter approach derived from coupled 1D and 2D hydrodynamic flow model By Mani, P., Chatterjee, C., and Kumar, R. *Natural Hazards* 70(2), 1553-1574 (2014)
69. Flow Simulation through Multiple Leaky Aquifers By A. K.Sahu and B. C. Mal *CSVTU Research Journal* . 6: 01-08 (2014)
70. FT-NIR Method to Determine Moisture in Gluten Free Rice Based Pasta during Drying By Navneet Singh Deora , Aastha Deswal , Hari Niwas Mishra *International Journal of Agricultural, Biosystems Science and Engineering* 8(3) (2014)
71. Fuel Properties improvement of Jatropha oil using exhaust heat of diesel engine. By Raheman H., Pradhan P. *Journal of the Institution of Engineers (India)* 90(2): 40-43. (2013)
72. Fuzzy logic (similarity analysis) approach for sensory evaluation of chhana podo By Mukhopadhyay, S., Majumdar G. C., Goswami T. K., and Mishra, H. N. *LWT – Food science and Technology*, 53(1): 205 - 210 (2013)
73. Grain storage: methods and measurements By A. Mishra, P. Prabuthas, H. N. Mishra *Quality Assurance and Safety of Crops & Foods* 4(3):144-146 (2012)
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82. Statistical modeling of groundwater in an alluvial aquifer system, By Sahoo, S. and Jha, M.K., *Indian Science Congress 2013 (ISC-2013)*, Calcutta University, Kolkata, (2013)
83. Subsurface Drip Irrigation for Wet Season Rice Production Under Climatic Variability in India, By y. A. Rajwade, D. K. Swain, and K. N. Tiwari, *31st Conference on Agricultural and Forest Meteorology*, Portland, (2014)
84. Thermal Analysis of Flat Plate Solar Air Collector Used for Drying Agricultural Commodities, By Kshanaprava Dhalsamant, P. P. Tripathy, S. L. Shrivastava, *22nd National and 11th International ISHMT-ASME Heat and Mass Transfer Conference 2013*, IIT Kharagpur, India., (2013)
85. Ultrasound assisted extraction of essential oils from residual turmeric feed, By Aditi K, Haldar S, Mishra H N, *National Seminar on Non Thermal Processing Techniques: Emerging Innovations for Sustainable, Safe and Healthy Foods*, HIT, Haldia, India, (2013)

## Department of Architecture & Regional Planning

### **Head**

Prof. Jaydip Barman

### **Professors**

Banerjee, Uttam Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Facility Planning, Environmental Management, Disaster Management, Architecture and Urban Planning, Landscape Planning, Infrastructure Information Systems, CAD and GIS
Barman, Jaydip	<i>Ph.D.(IIT Kharagpur)</i> , Urban Design, Green Buildings and Eco Habitat, Tourism Planning and Management, Urban Waterfront Development, Crime Prevention through Landscape Design in Urban Public Spaces
Chattopadhyay, Subrata	<i>Ph.D.(IIT Kharagpur)</i> , Effect of transit on housing choice, peri urban dynamics, residents satisfaction in company housing, energy efficient intervention in affordable housing, housing and human performance index
Datta, Rabindranath	<i>Ph.D.(IIT Kharagpur)</i> , City Planning, Urban and Regional Transportation Planning
Sen Gupta, Biplab Kanti	<i>MCP(IIT Kharagpur)</i> , Architectural Design for Institutional Buildings, Development Management and Finance, Urban and Regional Planning, Architecture and Urban Design
Sen, Joy	<i>Ph.D.(IIT Kharagpur)</i> , Community and Regional Planning Analyses & Programming, Architecture and Planning related Heritage Studies and Documentation

### **Associate Professors**

Basu, Sanghamitra	<i>Ph.D.(IIT Kharagpur)</i> , Tourism Planning in Historic Areas, Urban Conservation & Heritage Management, Architectural Design and Pedagogy, Quality of Life in Residential Neighbourhoods with focus on needs of senior citizens, Traditional Architectural and application of Shape Grammar, GIS in Urban Planning, Post Modernism & Contemporary Architecture, Quality of Life and Social Cohesion in various types of built environment
George, Abraham	<i>Ph.D.(Calicut University)</i> , Architecture Design-Pedagogy-Sustainable Age-friendly Designs-Landscape-Elderly Housing-Preservation
Sen, Somnath	<i>Ph.D.(IIT Kharagpur)</i> , Environmental Planning, Land Use and Development Control Planning

### **Assistant Professors**

Banerji, Haimanti	<i>Ph.D.(IIT Kharagpur)</i> , Barrier Free Architecture, Behavioral Architecture, Urban Design, Town Planning and Settlement Planning, Ergonomics and Product Design
Bhattacharya, Shankha Pratim	<i>Ph.D. (BIT, Mesra)</i> , Earthquake Resistant Building, Structural Systems, Building Physics

Chakraborty, Banhi	<i>Ph.D (IIT Kharagpur)</i> , Consumer Welfare, Culture and Livelihood, Rural and Forest Livelihood, Rural Economics
Das, Sutapa	<i>Ph.D. (National University of Singapore)</i> , Building maintainability, Building performance grading, Decision making, Construction materials, Project management, Intelligent building, Safety management, Building systems and services
Ghosh, Mainak	<i>M.Design(IIT Kanpur)</i> , Visual Communication Design and Architecture & Urban Design, Visual Thinking & Creativity, Interaction Design - Space. Form. Perception., New Media-Architecture-Urban Design
Gupta, Sumana	<i>Ph.D.(IIT Kharagpur)</i> , Architectural Design, Service Quality Evaluation, Facility Planning
Majumdar, Tapan Kumar	<i>MCP(IIT Kharagpur)</i> , Work environment in industries for industrial workers, Low cost Construction
Mazumder, Tarak Nath	<i>Ph.D (IIT Kharagpur)</i> , Urban Planning, Transportation Planning, Hazardous Waste Management
Pandit, Debapratim	<i>Ph.D.(Univ. of Tokyo)</i> , Transportation Planning, Urban Infrastructure utilities and services, Urban Environmental Planning & Management
Paul, Saikat Kumar	<i>MCP(IIT Kharagpur)</i> , Computer Application in Built Environment, GIS and Remote Sensing in Planning, Urban and Regional Planning, Architectural Design, Environmental Planning

#### ***Faculty Re-employment***

Prof. Rabindranath Datta      Professor

#### ***New Academic Programmes***

M. Arch: Master of Architecture in Sustainable Built Environment is under consideration.

#### ***Brief Description of on-going activities***

Architectural Design, Building Science and Environmental Planning: (Performance studies, Design Simulation and Intelligent Architecture, Building Automation and Management Systems, Sustainable Development, Energy Efficient Design, Appropriate Technologies, Spatial Environmental Planning, Eco-sensitive and Green Architecture)

Art and Architecture: (Indian Traditional Architecture and Heritage studies, Vernacular Architecture, Design, Visual Communication, Visual Simulation, Product design and Industrial design)

Infrastructure and spatial Planning: (Transportation Planning, Traffic Engineering and Management, Hazards and Disaster Mitigation and Management, Urban Design, Eco-tourism, Recreation and Landscape Planning, Conservation and Preservation Studies, Housing and Shelter, Social Infrastructure)

Urban Information System and Planning: (Urban Development Management and Finance, Advanced Planning Informatics, Geographical Information Systems, Decision support systems and Expert systems, Urban Settlement and Systems Dynamics)



Architecture, Media and Communication: (Cultural studies, Media and Architectural journalism, Symbolism and Cultural sustainability)

***Thrust Areas***

1. Green Architecture and sustainable designs and Energy efficiency.
2. Urban information system
3. Universal Design in Built Environment

***New Acquisitions***

1. Digital cum computerized Universal Testing Machine model MUTC- 60 Capacity 600KL

***Lectures by Visiting Experts***

1. Contemporary Architecture of Fernando Menis *by* Ar. Fernando Menis and Associates (Visiting Expert from Spain)
2. Modern Lighting concepts and LED applications in Interior Design and Urban Design. *by* Ms. Sudesha Mukhopadhyay (Director, Philips Lighting Education Program)
3. Clay Modelling, Pottery and Ceramics *by* Mr. Somnath Raha and group (Artist, Delhi Art College)
4. Approaches towards Transit Oriented Development (TOD) in current transportation planning. *by* Prof. S.L. Dhingra (Professor Emeritus, Civil Engineering, IIT Bombay)

***Doctoral and MS Degrees Awarded***

1. Keya Chakravarty : A Methodology to Assess inequality Variation within Kolkata Urban Agglomeration Applying Human Development Index based Indicators ( PhD)
2. Lakshmi Thilagam : Comparitive Analysis of Spatial Configuration of Historical Temple Towns of Tamil Nadu applying Space Syntax and Urban Image Analysis(PhD)
3. Paul Varghese : Shape Algebra and Rules in Design: Bridging the Gap between Formal and Intuitive Thinking (PhD)

***Member - Professional Bodies***

1. Mazumder, Tarak Nath, *Associate Member* - Council of Architecture
2. Mazumder, Tarak Nath, *Associate Member* - Institute of Town Planners, India
3. Paul, Saikat Kumar, *Regular* - Council of Architecture
4. Paul, Saikat Kumar, *Associate* - Institute of Town Planners India
5. Paul, Saikat Kumar, *Associate* - Indian Society of Remote Sensing
6. Pandit, Debapratim, *Associate Member* - Transport Research group of India
7. Pandit, Debapratim, *Associate Member* - Institute of Town Planners India
8. Pandit, Debapratim, *Member* - Council of Architecture
9. George, Abraham, *Graduate Member* - Haggai Institute for Leadership Training
10. George, Abraham, *Life Member* - Indian Society of Technical Education - ISTE
11. George, Abraham, *Registered Architect* - Council of Architecture - CoA
12. George, Abraham, *Associate Member* - Indian Institute of Architects
13. George, Abraham, *Member* - Indian National trust for Art and Cultural Heritage
14. George, Abraham, *Member* - Fulbright Academy
15. Das, Sutapa, *Life* - Indian Society for Technical Education (ISTE)
16. Das, Sutapa, *Life* - Building & Estate Management Alumni (BEMA), Singapore
17. Das, Sutapa, *Life member* - Institute of Smart Structures and Systems (ISSS), India

18. Das, Sutapa, *Observer* - Hong Kong Building Environmental Assessment Method (HK-BEAM), Hong Kong
19. Das, Sutapa, *Life* - Council of Architecture, India
20. Das, Sutapa, *Associate* - Institution of Facilities Management (IFM), Singapore
21. Banerji, Haimanti, *Member* - Council of Architecture
22. Banerji, Haimanti, *Associate Member* - Institute of Town Planners India
23. Bhattacharya, Shankha Pratim, *Member* - Global Science and Technology Forum
24. Bhattacharya, Shankha Pratim, *Associate Member* - The Institution of Engineers (India),
25. Bhattacharya, Shankha Pratim, *Life Member* - Indian Society for Technical Education
26. Gupta, Sumana, *Life Member* - Indian Institute of Architect
27. Gupta, Sumana, *Life Member* - Institute of Town Planners India
28. Gupta, Sumana, *Life Member* - Council of Architecture
29. Chakraborty, Banhi, *Associate member* - Institute of Town Planners India
30. Chakraborty, Banhi, *Country Representative* - Regional Network for Poverty eradication(RENPER)
31. Banerjee, Uttam Kumar, *Life Member* - Indian Society for Technical Education
32. Banerjee, Uttam Kumar, *Life Member* - Council of Architecture
33. Basu, Sanghamitra, *Associate Member* - Institute of Town Planners, India
34. Basu, Sanghamitra, *Associate Member* - Indian Institute of Architects
35. Basu, Sanghamitra, *Regular* - Council of Architecture
36. Barman, Jaydip, *Member* - Indian Society of Lighting Engineers (ISLE)
37. Barman, Jaydip, *Life member* - Indian Society of Technical Education (ISTE)
38. Barman, Jaydip, *Registered member* - Council of Architecture, New Delhi
39. Barman, Jaydip, *Member* - Institute of Indian Interior Interior Designers ( IIID)
40. Sen, Somnath, *Senior Member-FITP-84/35* - Institute of Town Planners INDIA
41. Sen, Somnath, *Associate-AR-8517* - Indian Institute of Architects
42. Sen, Somnath, *Regular* - Institute of Public Administration
43. Chattopadhyay, Subrata, *Member* - Council of Architecture
44. Chattopadhyay, Subrata, *Member* - Institute of Town Planners, India, Education Standing Committee
45. Majumdar, Tapan Kumar, *Life Member* - Council of Architecture
46. Majumdar, Tapan Kumar, *Associate* - Indian Institute of Town Planners
47. Majumdar, Tapan Kumar, *Associate* - The Indian Institute of Architects
48. Majumdar, Tapan Kumar, *Life Member* - Indian Society for Technical Education
49. Sen, Joy, *Associate Member Lifetime* - Institute of Town Planners India
50. Sen, Joy, *Associate Member* - Asia Pacific Network of Housing Research APNHR Hong Kong
51. Sen Gupta, Biplab Kanti, *Registered Member* - Council of Architecture
52. Sen Gupta, Biplab Kanti, *Associate* - Indian Institute of Architects
53. Datta, Rabindranath, *Member* - INSTITUTE OF TOWN PLANNERS INDIA
54. Ghosh, Mainak, *Registered Architect* - Council of Architecture - CoA
55. Ghosh, Mainak, *Associate Member* - Indian Institute of Architects

### ***Member - Editorial Board***

1. Basu, Sanghamitra (0) *Member* - IAHS 2014 organising committee
2. Das, Sutapa (2013) *Member* - Journal of Building Construction and Planning Research
3. Datta, Rabindranath (2010) *Member of Editorial Advisory Board* - SPANDREL
4. George, Abraham (2009) *Member of Editorial Board* - ICFAI Journal of Architecture
5. George, Abraham (2011) *Reviewer* - Journal of Architectural Engineering
6. George, Abraham (2012) *Reviewer* - Journal of Architectural Engineering,
7. George, Abraham (2012) *Editorial Board Member* - Journal of Education and Practice
8. George, Abraham (2012) *Editorial Board Member* - Journal of Design Studies

9. George, Abraham (2014) *Co-Editor in Chief* - Annual International Conference on Architecture and Civil Engineering
10. George, Abraham (2016) *Member of the Scientific Committee* - ICSA-2016-Spain
11. George, Abraham (2010) *Editorial Board member* - Journal of Emerging Trends in Educational Research and Policy Studies
12. Sen Gupta, Biplab Kanti (2007) *Member of the Editorial Board* - Spatio - Economic Development Record
13. Sen Gupta, Biplab Kanti (2007) *Member of the Editorial Board* - ABACUS
14. Sen Gupta, Biplab Kanti (2010) *Member of the Editorial Advisory Board* - SPANDREL - a Bi Annual Internationally referred Journal
15. Sen, Joy (2012) *Associate Editor* - CSVTU Research Journal
16. Sen, Joy (2012) *Reviewer (Editorial Board)* - JA Journal of Architecture

### ***Awards & Honours***

1. Paul, Saikat Kumar (2013) *Fulbright Fellowship Awarded for research at Cornell University*
2. Barman, Jaydip (2013) *Supervised Third year B.Arch. students in Transparency 2013 National Design Competition sponsored by Saint-Gobain and received Regional Best Design Award and Second Prize at National Level.*

### ***Sponsored Research Projects***

1. A Creative economic regeneration and urban design revival project: Boipara - college street, Kolkata (MHRD, DEPARTMENT OF HIGHER EDUCATION, NEW DELHI, Rs.105.00 Lakhs)
2. Application of Artificial Intelligence on Mapping Coastal Inundation and Evacuation route planning through multiple scenarios of Storm Surge Simulation (, Rs.50.00 Lakhs)
3. Artificial intelligence for societal needs: Knowledge discovery and intelligent decision making for solving problems in Indian context related to energy (IIT Kharagpur, Rs.500.00 Lakhs)
4. ASSESSING THE CURRENT & FUTURE CREATIVE ECONOMIC REGENERATION SCOPE OF TRADITIONAL RIVER -BASED HERITAGE & ECO-TOURISM NETWORKS IN KMA, BENGAL (MHRD, Rs.50.00 Lakhs)
5. Assessing the current and future creative economic regeneration scope of traditional river based heritage and eco - tourism networks in KMA, Bengal ( MHRD, DEPARTMENT OF HIGHER EDUCATION, NEW DELHI, Rs.50.00 Lakhs)
6. Creation of a Universally Stimulating and Responsive Environment within Hospitals - A Conceptual Research Model (SRIC, Rs.4.70 Lakhs)
7. Design and Development of Paddle Driven Wheel (2005-2008) (Herons Bonsai Ltd., UK, Rs.0.00 Lakhs)
8. Development of a Methodology for Bus Transit Reform and Redesign: Case study Kolkata (ISIRD, SRIC, IIT Kharagpur, Rs.2.80 Lakhs)
9. Development of Guidelines for Infrastructure facilities for Mega Religious Events - Case Study Ratha Yatra 2014 and Nabakalebar 2015, Puri (ISIRD Project, SRIC, IIT Kharagpur, Rs.7.90 Lakhs)
10. Development of Trend-generating Communication Model in Architecture (SRIC/IIT Kgp, Rs.3.00 Lakhs)
11. Development of Women Technology Park in Nayagram Tribal Block, West Midnapore, West Bengal (Department of Science and Technology, Govt. of India, Rs.24.71 Lakhs)
12. Elderly-Friendly Built Form Design And Infrastructure Management Model And Knowledge Networking (MHRD-Future of Cities, Rs.251.81 Lakhs)
13. Empowerment of Village Youth Through Improved Mud Block Making (Faculty Challenge Grant- IIT Kharagpur, Rs.1.00 Lakhs)
14. Energy efficient intervention for affordable housing (HUDCO, Rs.21.00 Lakhs)

15. Ferro-Cement as a Cost Effective Building Material (SGFSS, SRIC, IIT Kharagpur, Rs.1.00 Lakhs)
16. Framework for improving bicyclists accessibility to rail stations (MHRD,Department of Higher Education, Rs.32.32 Lakhs)
17. Future of cities (MHRD, Rs.2500.00 Lakhs)
18. Future of Cities (MHRD Goct of India, Rs.2500.00 Lakhs)
19. Improving quality of life of senior citizens in residential neighborhoods in an Indian context (MHRD,Department of Higher Education, Rs.31.72 Lakhs)
20. Land use interventions in Peri-urban areas for managing urban growth (MHRD, Rs.43.50 Lakhs)
21. Market Mechanism and the Drug Availability -State of Consumers Health-An Investigative Study (2009-2010) (Ministry of Consumer Welfare and F.B.P., Govt.of India, Rs.4.42 Lakhs)
22. Modeling Relationship between Urban Development and Water Use, (MHRD, Rs.96.00 Lakhs)
23. Planning Recommendation for Urban Neighborhoods to regulate Thermal Fluxes in a Hot-Humid Climate Region: Case Study of Kolkata (MHRD, Rs.53.00 Lakhs)
24. Rural Industrialisation in West Bengal: Technology Intervention & Management of Development (TMD) (Khadi and Village Industries Commission, Govt. of India, Rs.60.00 Lakhs)
25. SANDHI A Science-Heritage Exploratory Initiative (16 projects) (MHRD Govt of India, Rs.2000.00 Lakhs)
26. SURVEY AND DEMARCATION OF DEFENCE LAND IN BARRACKPORE CANTONMENT (Barrackpore cantonment Board, Rs.8.69 Lakhs)
27. Technology Dissemination Program of IIT Kharagpur Interface of KVC programme (Khadi and Village Industries Commission, Govt. of India, Rs.12.00 Lakhs)
28. To establish a scientific correlation between 2 - D ecologic footprints and 3 - D built formulation in a)indian architecture and b) its relationship w (MHRD,DEPARTMENT OF HIGHER EDUCATION, NEW DELHI, Rs.100.00 Lakhs)
29. TO ESTABLISH A SCIENTIFIC CORRELATION BETWEEN 2-D ECOLOGIC FOOTPRINTS & 3-D BUILT FORMULATION IN A) INDIAN ARCHITECTURE & B) ITS RELATIONSHIP WITH THE (MHRD, Rs.50.00 Lakhs)
30. To establish linkages between Iconographic Re - interpretation of Architecture and engineering patterns of Pre - Budhist / Vedic and Buddhist period ( (MHRD,DEPARTMENT OF HIGHER EDUCATION, NEW DELHI, Rs.75.00 Lakhs)
31. Urban - design, planning & urban engineering exploration of Varanasi (UDE) (MHRD,DEPARTMENT OF HIGHER EDUCATION, NEW DELHI, Rs.150.00 Lakhs)
32. Women Technology Park at Nayagram Tribal Block,Paschim Medinipur,West Bengal (Science & Society Division, Deptt. of Science & Technology, Govt. of India, Rs.46.00 Lakhs)

### ***Consultancy Projects***

1. Architectural Design of Nalanda Class Room Complex at IIT Kharagpur (IIT Kharagpur, Rs.72.00 Lakhs)
2. Comprehensive Architectural Services for SOEE at the STEP IIT Complex as well as Enterprenureship Park at Gopali (Executive Director STEP, IIT Kharagpur, Rs.8.00 Lakhs)
3. Consultancy Services for construction of Sister Nivedita Hall of Residence at IIT Kharagpur (National Building Construction Corporation, Rs.3300000.00 Lakhs)
4. CONSULTANCY SERVICES FOR INTERIOR DESIGN WORKS AND PROJECT MANAGEMENT SERVICES OF SECRETARIAT BUILDING IN CAPITOL COMPLEX AT NAYA RAIPUR (Naya Raipur Development Authority, Rs.3309000.00 Lakhs)
5. Development plan preparation for Korba Chhattisgarh (Directorate of Town & Country Planning, CG govt. of Orissa, Rs.30.00 Lakhs)

6. Development Strategies for Coochbehar District (NREG, Coochbehar, Rs.10.00 Lakhs)
7. Establishment of Indian Institute of Corporate Affairs (Ministry of Corporate Affairs, Govt. of India, New Delhi, Rs.160.70 Lakhs)
8. GIS based land use preparation and environmental planning for Commercial Center at Wadala, Mumbai (MMRDA, Rs.2000000.00 Lakhs)
9. GIS based map preparation for Old Planning Area of Siliguri Jalpaiguri Development Authority (Siliguri Jalpaiguri Development Authority, Rs.3870802.00 Lakhs)
10. Land Use and Development Control Plan, Asansol Sub-Division (ADDA, Rs.40.00 Lakhs)
11. Monitoring landuse changes at Barrackpore Cantonment (Barrackpore Cantonment Board, Rs.8.50 Lakhs)
12. Optimum Utilisation of Land Resources (Pilot work in Bihar) (GICPL, STEP IIT Kharagpur, Rs.2.50 Lakhs)
13. PRELIMINARY MASTER PLAN FOR CSIR INNOVATION COMPLEX AT BARUIPUR (CSIR, Rs.533710.00 Lakhs)
14. Preparation of a GIS based mapping system for SJPA (SJDA, Rs.38.00 Lakhs)
15. Preparation of Architectural construction drawings for St Xaviers campus in New Town Kolkata (Basumati Enterprise on behalf of St Xaviers College Kolkata, Rs.30.00 Lakhs)
16. Preparation of Land Use and Development Control Plan for Haldia (RLDC) (HDA, Rs.55.00 Lakhs)
17. Preparation of Land Use and TOD plan for Hyderabad Metro Rail Project (Hyderabad Metro Rail Limited, Rs.28.00 Lakhs)
18. Preparation of Perspective Plan- Vision 2030 and Comprehensive Development Plans for Planning Areas of Bhubaneswar & Cuttack Development Authority (Housing and Urban Development, Government of Orissa, Rs.165.29 Lakhs)
19. Preparation of Temple Plan in Midnapore (Loknath Temple Trust Midnapore, Rs.1.00 Lakhs)
20. PREPARATION OF ZONAL DEVELOPMENT PLANS FOR 14 PLANNING ZONES OF BHUBANESWAR DEVELOPMENT PLAN AREA (Bhubaneswar Development Authority, Rs.39163000.00 Lakhs)
21. REVISION/AMENDMENT OF THE LANDUSE AND DEVELOPMENT CONTROL PLAN FOR OLD HALDIA PLANNING AREA (Haldia Development Authority, Rs.5515000.00 Lakhs)
22. Survey of Defence Land at Barrackpore Cantt. (Cantt. Board, Rs.8.70 Lakhs)
23. Survey of Defence Land at Jalapahar Cantt. (Cantt. Board, Rs.5.50 Lakhs)
24. Survey of Defence Land at Lebung Cantt. (Cantt. Board, Rs.4.80 Lakhs)
25. Survey of Defence Land at Shillong Cantt. (Cantt. Board, Rs.26.50 Lakhs)
26. Third Party Inspection of Construction of Pravasi Bharatya Kendra, at Chanakyapuri, New Delhi (Ministry of Overseas Indian Affairs, Govt. of India, New Delhi, Rs.89.89 Lakhs)
27. Third Party Inspection of Retrofitting, Restructuring & Interior Decoration works of Khadi Gramadyog Bhawan, at Connaught Place, New Delhi (Khadi and Village Industries Commission, Ministry of MSME, Govt. of India, New Delhi, Rs.8.99 Lakhs)

### **Visits Abroad by Faculty Members**

1. Bhattacharya, Shankha Pratim - Oral Presentation : 2nd Annual International Conference on Architecture and Civil Engineering (Singapore, ) 23-24th March, 2014
2. Sen, Joy - Conference of APNHR (Asia Pacific Network of Housing Research) (Kuala Lumpur Malaysia, ) August 2013 5 days
3. Chattopadhyay, Subrata - To attend 39 IAHS World Housing Conference, chair session, present paper (Milan Italy, ) 17-20 September, 2013
4. Basu, Sanghamitra - presenting paper in conference and visiting universities (UK, ) 10 days

### **Invited Lectures by Faculty Members**

1. Environmental Protection and Sustainable Development of Coastal Settlements *by* Paul, Saikat Kumar (Raipur)
2. A timeline of housing *by* Chattopadhyay, Subrata (BIT Mesra)
3. Social Housing-lessons from world examples *by* Chattopadhyay, Subrata (SPA Bhopal)
4. Gems from the return trip - glimpses of Swamiji and Science and Technology in the Americas *by* Sen, Joy (150 years Birthday celebrations of Swami Vivekananda)
5. B Arch Thesis - framework and deliverables *by* Sen, Joy (NASA Panel discussion Jadavpur University)
6. Future of Cities - Heritage and Continuity *by* Sen, Joy (Future of Cities Workshop at IIT Bombay)
7. Cultural studies and History - case of Varanasi *by* Sen, Joy (SANDHI Workshop at IIT BHU)
8. Deconstruction workshop *by* Sen, Joy (MHRD SANDHI & Future of Cities Meet New Delhi)
9. Future of Cities - Varanasi project series 1 *by* Sen, Joy (MHRD Future of Cities Meet 1 New Delhi)
10. Varanasi - a mega exploratory project *by* Sen, Joy (MHRD Future of Cities Meet 2 New Delhi)
11. SANDHI lecture 1 MHRD Meet *by* Sen, Joy (IIT Kanpur)
12. Science and Technology in the IIT System on March 28 2014 *by* Sen, Joy (The Asiatic Society Kolkata)
13. Creative Economy in Kolkata on Feb 28 2014 *by* Sen, Joy (SOUND SQUARE organized by Kolkata Museum of Modern Arts Kolkata)
14. Protecting Environment through Sustainable Urban Planning: Green Cities *by* Banerji, Haimanti (AISECT University, Bhopal)
15. Earthquake Resistant Reinforced Concrete Structures *by* Bhattacharya, Shankha Pratim (AISECT University, Bhopal, MP, India)
16. Planning Guidelines for a Sustainable Habitat – Managing Urban Transport, *by* Datta, Rabindranath (SPA Bhopal)
17. Indian Cities in Transition-Sustainable Options *by* Sen, Somnath (New Delhi, Centre for Science & Environment (CSE))
18. Design for Architectural and Urban Spaces towards Crime Prevention *by* Barman, Jaydip (Department of Architecture, National Institute of Technology, Patna)
19. Water Sensitive Planning Guidelines at residential cluster level *by* Sen, Somnath (KMDA, Kolkata, Reg. Workshop on Urban Water management-CSE)
20. WSUP- a contemporary approach for sustainable urban development *by* Sen, Somnath (GOA, Panjim, CSE Reg. Workshop on Urban water Management)
21. Role of Water sensitive Urban Design in UWM *by* Sen, Somnath (New Delhi, India Habitat Centre, CSE Workshop)
22. “Temples of Bishnupur: towards a management framework”, *by* Basu, Sanghamitra (NMA-IIC (National Monuments Authority & Indian International Centre), Workshop on World Heritage Sites, New Delhi)
23. Birth of Modern Town Planning in India and the 20th Century Railways Townships: A Case for Seria *by* Basu, Sanghamitra (International Conference-cum-Workshop ‘Filling the Gaps: World Heritage and the 20th Century’, Chandigarh, India)
24. The Shadow of a Capital City to a Cultural Capital : Rediscovering Old Bhubaneswar *by* Basu, Sanghamitra (New Delhi (IIC) Monthly Lecture Series, India international Centre, New Delhi)

### **Books Published**

1. Das, S.: Hidden cost in public infrastructure project: A case study of Kolkata East–West Metro (Chapter) in Urbanization in Asia (Ed. K.S. Sridhar & G.Wan) *published by* Springer (2014)

2. Debapratim Pandit and Arif Merchant: District Human Development Report, Paschim Midnapore: Chapter 8:Industrialization, Urbanization and Environment *published by* Development and Planning Department, Government of West Bengal (2011)
3. Debapratim Pandit and Keisuke Hanaki: Designing Sustainable Products, Services and Manufacturing Systems, Chapter 8 A model for sustainable neighborhood regeneration *published by* Research Publishing Services, Singapore (2011)
4. Joy Sen: Sustainable Urban Planning *published by* The Energy Research Institute (TERI) IHC New Delhi (2013)

### ***Papers Published in Journals***

1. A Framework for Determining Commuter Preference along a Proposed Bus Rapid Transit Corridor *By* Pandit Debapratim and Das Shreya. *Procedia - Social and Behavioral Sciences,Elsevier* 104: 894-903 (2013)
2. A smart approach of housing affordability assessment in Kolkata *By* Ankhi Banerjee and Joy Sen *INDIAN CITIES IN TRANSITION Technical papers (part II) Journal of ITPI, India* Vol 2 pp 465 - 471 (2013)
3. An Analytical Format for Identification and Translation of Traditional Principles for Designing Contemporary Chatushala Residential Houses of Kerela' *By* Santhosh Kumar K.G. & Dr Sanghamitra Basu *ABACUS* Vol 7, No. 2, Monsoon (2013)
4. An investigation on location choice for housing in mining towns: Case study of Korba India *By* Subrata Chattopadhyay, Debapratim Pandit et. al. *Int. Journal for Housing Science* Vol.37, No.2 pp.63-7 (2013)
5. Assessment of composite housing affordability within KMA *By* Ankhi Banerjee and Joy Sen *International Journal of Property Sciences* Vol 3 Issue 1 (2013)
6. CO2 emissions from household consumption in India between 1993–94 and 2006–07: A decomposition analysis *By* Aparna Das, Saikat Kumar Paul *Energy Economics* 41, 90-105 (2014)
7. Conceptual development of a spatially distributed water budget model and application Indian Watersheds *By* ANITA MUKHERJEE, SOMNATH SEN, SAIKAT KUMAR PAUL *International Journal of Earth Sciences and Engineering* communicated (2013)
8. Construction site fire: Review of risk factors and recommendations for mitigation *By* Das,S. *The Asian Review of Civil Engineering* 2(1), 13-19 (2013)
9. Desirable physical and psychosocial dimensions in high-rise group housing, *By* Bhunia, A., Chattopadhyay, S., *Journal of Institute of Town Planners India* vol. 10, no.03 (2013)
10. Determination of Level-of-Service scale values for quantitative bus transit service attributes based on user perception *By* Shreya Das and Debapratim Pandit *Transportmetrica A: Transport Science* Accepted (2014)
11. Developing an efficient prioritization model for slum redevelopment (A study related to implementation of 'Rajiv Awaas Yojana' in Howrah Eastern India. *By* Dey, P., Chattopadhyay, S. *The International Journal's Research Journal for Social Science and Management*, vol 3 no. 9 (2014)
12. Developing Strategies for the Application of Rajiv Awas Yojana in Howrah *By* Dey, P., Chattopadhyay, S. *Spatio Development Record* vol. 20, pp 118-131 (2013)
13. Form Frames Function *By* Mainak Ghosh *Journal of the Indian Institute of Architects* Vol. 78 (9) pp 21-23 (2013)
14. Identification of Key Performance Indicators of Security Management for Thermal Power Plants *By* Choudhury, R.S. & Das, S. *Journal of Applied Security Research* 9 (2), 150-171 (2014)
15. Importance of User Perception in evaluating Level of Service for Bus Transit for a developing country like India: A Review *By* Shreya Das and Debapratim Pandit *Journal of Transport Reviews* 33 (4): 402-420 (2013)
16. Inclusive planning - significance and different approaches case of KMA *By* Basudatta sarkar Haimanti Banerjee and Joy sen *INDIAN CITIES IN TRANSITION Technical papers (part II) Journal of ITPI, India* Vol 2 pp 221 - 225 (2013)

17. Inclusive planning - significance and different approaches for urban poor: case study- Kolkata urban agglomeration By Sen J., Banerji H., Sarkar B *ITPI Journal* 125-129. (2013)
18. Inclusive planning to achieve balanced regional development By Amruta Khairnar and Joy Sen *INDIAN CITIES IN TRANSITION Technical papers (part II) Journal of ITPI, India* Vol 2 pp 210 - 212 (2013)
19. MGNREGA and sustainability issue of rural built-up structures in India, By Chakraborty, B. & Das, S. *Journal of Construction in Developing Countries* Accepted (2014)
20. MGNREGA and Water Management: Sustainability Issues of Built Forms of Rural India By Banhi Chakraborty *Journal of Construction in Developing Countries* (2014)
21. Need for Sustainable Communities & Cities By Saikat Paul *Housing and Home Environment News* Spring 2013 (2013)
22. Passenger Dispersal Plan for Proposed East -West Mass Rapid Transit Corridor in East Kolkata By Sumana Gupta and R. N. Datta *ITPI Journal*, Vol-10,No-2,pp79-88 (2013)
23. Relevance of New Urbanism in the Context of Developing Countries – A Literature Review By Suparna Saha, Dr. Sanghamitra Basu and Dr. Debapratim Pandit *ABACUS* Vol. 8, No.1,19 -27 (2013)
24. Test for Causality and Long-run Relationship between Transport Infrastructure and Economic Development in India By T S Maparu, T N Mazumder *Interdisciplinary Journal of management and Behavioral Sciences* Vol.2 No. 4 (2013)
25. Visual Perception of Urban Place: Issues Need Attention in Kolkata By Mainak Ghosh, Sanjib Nag, Souvanic Roy *Journal of the Indian Institute of Architects* Vol. 78 (7) pp 49-51 (2013)

#### ***Papers Presented in Conferences***

1. . Growth of Micro, Small and Medium Scale Enterprises: A Creative Economic Base to Achieve Less-vulnerable Livelihood in Developing Nations, By Sarkar B., Banerji H., Sen J, *International Conference on Architecture and Engineering in Urban Development*, Colombo, Sri Lanka., (2013)
2. A Critical Evaluation of Thermal Performance of Traditional Built Forms of South West Bengal, By Alapure, G.M., George, A, Bhattacharya, S.P., *2nd Annual International Conference on Architecture and Civil Engineering*, Canning Walk, Singapore, (2014)
3. A framework for bus transit reform & redesign: Case study Kolkata, By Debapratim Pandit and Shreya Das, *13th International Computers in Urban Planning and Management Conference*, Utrecht, Netherlands, (2013)
4. A Rational Approach for Sympathetic Intervention in Heritage Zone: A Case Study of Bhubaneswar Old Town, By Vaswati Chatterjee (with Sanghamitra Basu),, *Revisiting Kathmandu safeguarding living urban heritage, International Symposium organised by ICOMOS, UNESCO, World Heritage Institute of Training and Research for the Asia and the Pacific Region (WH, Kathmandu Valley, Nepal*, (2013)
5. A Systematic Approach for Evolving Byelaws, Codes and Guidelines in Heritage Conservation Areas : Use of Visual Simulation Techniques, By S Basu, A Mukerji and V Chatterjee, *STREMAH 2013 - 13th International Conference on Studies, Repairs and Maintenance of Heritage Architecture*, New Forest , UK, (2013)
6. Analyzing Spatio-temporal Urban Growth Dynamics: A Case Study of Kolkata Metropolitan Area (KMA), India 1980-2012, By Mithun, SK., Chattopadhyay, S., *12 12 Asian Urbanization Conference*, BHU, UP, India, (2013)
7. Comparison of Two Metro Station Areas of Two Indian Cities for Socio-Ddemographic Attributes and Travel Characteristics, By Reddy, A., .S., Chattopadhyay, S., Mazumder, T, *International Conference on Sustainable Urban Transport Planning SUTP*, Belgrade, (2013)
8. Conceptual Development of spatially distributed water budget model for its application in Indian Watershed, By Anita Mukherjee, Somnath Sen, Saikat Paul, *Int. Conference on Advances in Water Resource Development and Management*, Punjab University, Chandigarh, (2013)



9. Conservation of Historic Street , Park Street, Kolkata – an urban corridor in transition, By Nilesh Kr. Layek and Dr Sanghamitra Basu, *Cities Under Restoration - International Symposium*, Kolkata, India, (2013)
10. Dynamics and Growth Dichotomy of Urban Villages - Case Study Delhi., By Chattopadhyay, S., Dey, P., Michael, J., *39th IAHS World Housing Conference*, Milan, Italy, (2013)
11. Dynamics in Metropoliatn Fringes in the context of urban sprawl, By Prof B.K. Sengupta and Janani Tyagarajan, *Management of land in urban fringes: Controlling urban sprawl*, Kolkata, (2013)
12. Globalization can lead to inclusive growth in developing countries - myth or reality, By Banerji Haimanti, *International Scientific Conference Economic and Social Development*, Paris, France, (2013)
13. Health and safety aspects of sanitary-plumbing system of buildings, By Sutapa Das, *IETSD 2012: Int. Conf. on Innovation in Engg & Tech. for Sustainable Dev.*, Sathyamangalam, India, (2012)
14. Land management systems in India: Some issues, By Sarkar B., Banerji H., Sen J, *National Symposium on Managing Lands in Urban Fringes: Controlling Urban Sprawl*, Institute of Town Planners India, West B, (2013)
15. Lean Production Theory and its Application in Construction Industry, By Sanyal, A.P. and Bhattacharya, S.P., *Emerging Trends in Science and Technology: Impact on Environment and Society for Inclusive Growth*, AISECT University, Bhopal, (2014)
16. Market Mechanism and the Drug Availability – State of Consumers’ Health : An Investigative Study, By Banhi Chakraborty, *Consumer Protection & Consumer Welfare*, Indian Institute of Public Affairs, ND, (2013)
17. Methodology to determine commuter preference for a proposed bus rapid transit corridor, By Debapratim Pandit and Shreya Das, *2nd Conference of Transportation Research Group of India*, Agra, India, (2013)
18. Methodology to determine Level of Service for Bus Transit in a developing country like India, By Shreya Das and Debapratim Pandit, *13th International Computers in Urban Planning and Management Conference*, Utrecht, Netherlands, (2013)
19. Policy , Welfare and Governance : Where is the Interface, A Case Study, By Banhi Chakraborty, *RENPER 4*, UMK, Kelantan, Jelli Campus, Malaysia, (2013)
20. Policy, Welfare and Governance : A case Study of MGNREGA in India, Where is the Interface?, By Banhi Chakraborty, *International Seminar of Regional Network on Poverty Eradication*, Kelantan University, Kelantan, Malaysia, (2013)
21. Proposed POE framework for intelligent building, By Sutapa Das, *AARCV 2012: Int. Conf. on Advances in Arch. & Civil Engg.*, Bangalore, India, (2012)
22. Responsive Urban Open Spaces Towards Crime Prevention –Reviewing Current Approaches For Sustainable Development, By Dr. Jaydip Barman and Ms. Aditi T Koshley, *National Symposium on Sustainability and the Built Environment: Searching for Synergies*, BESU, Shibpur, (2014)
23. Social Equity: A missing link towards sustainable development. ,, By Sarkar B., Banerji H., Sen J, *.National Symposium on Sustainability and Built Environment*, Indian Institute of Engineering Science, (0)
24. Sustainable Planning through Introduction of Bicycle Facilities in Indian Cities, By Arun C. Babu &Dr. Sumana Gupta, *National Symposium on Sustainability and the Built Environment: Searching for Synergies February 21-22, 2014*, Bengal Engineering and Science University, Shibpur, India, Bengal Engineering and Science Universit, (2014)
25. Test for Causality and Long-run Relationship between Transport Infrastructure and Economic Development in India, By T S Maparu, T N Mazumder, *International Conference on Development Prospects of Indian Economy (ICDPIE-14)*, Jaipur, India, (2014)
26. The impact of Buddhist art and philosophy on the Eastern Mediterranean civilization 300 BCE, By Joy Sen, *National Seminar on Buddhism: Art and Philosophy*, Gyana Pravaha Varanasi, (2013)

## Department of Biotechnology

### **Head**

Prof. Tapas Kumar Maiti

### **Professors**

Das, Amit Kumar	<i>Ph.D.(Calcutta Univ)</i> , Structural Biology and Biochemistry, Crystallographic study of proteins from <i>M.tuberculosis</i> and <i>S. aureus</i> , Structural Bioinformatics
Das, Debabrata	<i>Ph.D.(IIT Delhi)</i> , Biohydrogen production processes, CO <sub>2</sub> sequestration for algae cultivation, Microbial fuel cell
Dey, Satyahari	<i>Ph.D.(IIT Kharagpur)</i> , Bio-prospecting genes & molecules. Molecular profiling Antarctic flora. Nutraceutical development
Ghosh, Ananta Kumar	<i>Ph.D.(Calcutta Univ)</i> , Recombinant DNA Technology, Hybridoma Technology, Molecular Virology, Antimicrobial peptides
Ghosh, Sudip Kumar	<i>Ph.D.(Kalyani Univ)</i> , Plant Molecular Biology, Nanobiotechnology, Molecular and Cellular Parasitology
Kundu, Subhas Chandra	<i>Ph.D.(BHU, Varanasi)</i> , Cell based tissue engineering and regenerative medicine, Silk biomaterials and bioactive molecule delivery
Maiti, Tapas Kumar	<i>Ph.D.(Kalyani Univ)</i> , Plant lectins and lectin derived peptides in cancer therapy, Mushroom derived glucans as immunomodulators, Biomicrofluidics and biochip development, Tissue engineering through top down and bottom up approach

### **Associate Professors**

Ghosh, Anindya Sundar	<i>Ph.D.(Calcutta Univ)</i> , Microbial genetics, Antimicrobial chemotherapy, Bacterial biofilm, Physiology and Biochemistry of Penicillin-binding proteins (PBPs)
Maiti, Mrinal Kumar	<i>Ph.D.(Calcutta Univ)</i> , Metabolic engineering of plant and fungal storage-lipids, Functional genomics of rice crop for improved productivity, Bioprospecting of endophytic microbes for healthcare products
Sar, Pinaki	<i>Ph.D.(BHU, Varanasi)</i> , Geomicrobiology of arsenic contaminated groundwater, Bioremediation of Petroleum refinery waste, Microbial diversity-Metagenomics and Environmental biotechnology, Molecular methods in detection of microbes in drinking water, Microbial diversity and bioremediation of Acid Mine Drainage
Sen, Ramkrishna	<i>Ph.D.(IIT Madras)</i> , Biosensor, Algal Biofuels and Bio-CCS, Biorefinery, Bioprocess Development Modeling & Optimization, Marine Biotechnology, Biochemical Engineering, Enzymes and Biofuels Technology, Bioenergy, Probiotics and Nutraceuticals, Environmental Biotechnology

### ***Assistant Professors***

Bahadur, Ranjit Prasad	<i>Ph.D.(Jadavpur Univ)</i> , Bioinformatics and Computational Structural Biology
Ganguly, Agneyo	<i>Ph.D.(IICB, Kolkata)</i> , DNA repair mechanisms in kinetoplastid parasites, DNA repair mechanisms in response to topoisomerase I poisoning

### ***Faculty Appointments***

Agneyo Ganguly	Assistant Professor
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### ***Brief Description of on-going activities***

1. Process development & optimization for the production of an anti-tumor biosurfactant. 2. Alkaline lipase production. 3. Production of Biodiesel and its evaluation. 4. Bioremediation of heavy metals, radionuclides and organic pollutants; molecular analysis of microbial community structure and function at contaminated sites. 5. Development of methods of o-antigens and its relation with pathogenecity in Gram negative bacteria. 6. Bioreactor strategies for the enhanced production of probiotic endospores for Nutraceutical formulations and their clinical evaluation. 7. Molecular characterization of metronidazole activation and deactivation pathways in *Entamoeba histolytica*. Characterisation of *E. histolytica* surface proteins. 8. Molecular cloning, expression and characterization of *E. invadens* encystation specific proteins. 9. Recombinant protein (therapeutic & diagnostic) expression in plant, animal and microbial systems. 10. Structural and functional studies of protein from *M. tuberculosis* and *S. aureus* aiming at drug and inhibitor design. 11. Improvement of hydrogen production from industrial waste using hybrid bioreactor. 12. Continuous hydrogen production by immobilized recombinant *E. coli* BL-21. 13. Molecular analysis of cypovirus infecting tasar silkworm. 14. Phytomedicine and molecular farming. 15. Development of silk ( fibroin and sericin) based Biomaterials and cell based tissue (skin and bone) engineering. 16. Development of low fat content transgenic oilseed plant. 17. Biomicrofluidics and Biochip development. 18. Identification and characterization of immunomodulator from natural sources. 19. Microbial fuel cell. 20. Characterization of Antarctic microbiota. 21. Probiotic nutraceutical development.

### ***Thrust Areas***

1. Healthcare Biotechnology (Prospecting novel therapeutics/diagnostics molecules for cancer, protozoan parasites, microbes, tuberculosis, etc.).
2. Bio-energy (Production of bio-diesel, bio-ethanol & bio-hydrogen).
3. Bioremediation, Biomaterials and Tissue engineering

### ***New Acquisitions***

1. Deep Freezer
2. Mercury/ Hydride System
3. Horizontal High Pressure Steam Sterilizer
4. Laminar Flow
5. Sonicator and Ultra sonicator
6. Filtration System
7. PH Meter with Electrode
8. Typhoon
9. Spectrophotometer
10. Ice flaker
11. Millipore Water Purification System
12. Incubator Shaker (2 Nos.)

13. Akta Purifier UPC-10
14. CO2 Incubator

### ***International Collaborations***

Prof. S. C. Kundu has four collaborative research projects: (iv) Project on Immunogenic responses of silk biomaterial used for cell based tissue engineering and regenerative medicine, Professor Heinz Redl, LBI-Ludwig Boltzmann Institute for experimental and clinical traumatology, Vienna, Professor Martijn van Griensvan, Indo- Austrain (DST-BMWF) in 2011 (two years)

Prof. D. Das has two international collaborative projects : (i) Indian-Norwegian-Swedish collaboration project entitled "BioCO<sub>2</sub>: An integrated multidisciplinary project using solar energy for production of renewable hydrogen combined with CO<sub>2</sub> capture, to address global warming and energy production" sponsored by Norwegian Foreign Ministry. Collaborating Universities: Oslo University, Norway and Uppsala University, Sweden (ii) Indian-Danish collaborating project entitled "High rate algal biomass production for food, feed, biochemicals and biofuels" sponsored by Department of Biotechnology, Govt. of India. Collaborating Universities: Technical University of Denmark and Copenhagen University, Denmark

Prof. R. Sen has two international collaborative projects : (i) Federal University of Rio-de-Janeiro (Brazil) through DST-CNPq program (Biofuel) (ii) University of Minho, Portugal through DST-Portugal program (Biosurfactant)

### ***Lectures by Visiting Experts***

1. Chasing Indian Pathogens *by* Prof. M. R. N. Murthy (Molecular Biophysics Unit, Indian Institute of Science, Bangalore- 560 012)
2. MicroRNA mediated regulation of plant resistance towards phloem-feeding insect pest *by* Dr. Sampurna Sattar (Post Doctoral Fellow, College of Agricultural Sciences, The Pennsylvania State University, University Park, PA 16802)
3. Development of selectable marker-free transgenic rice: Transgene stacking by sequential Agrobacterium- mediated co-transformation *by* Dr. K. Veluthambi (Professor, School of Biotechnology, Madurai Kamaraj University, Madurai- 625021)
4. Poor Stability of Peptide-MHC Complex in Leishmania Donovanii Infection is reversed by Liposomal Cholesterol *by* Dr. Syamal Roy (Principal Scientist, Infectious Diseases & Immunology Division)
5. MicroRNAs associated with cancer: Search for signatures *by* Dr. Sumit Biswas (Assistant Professor of Dept. of Biological Sciences, BITS, Pilani- K K Birla Goa Campus)
6. Regulation of microtubule dynamics by unusual MAPs: Role of microtubule dynamics in cell motility *by* Dr. Dulal Panda (Professor, Department of Biosciences & Bioengineering, IIT-Bombay, Mumbai- 400076)
7. Discerning the structure, function and dynamics of pro-apoptotic serine protease HtrA2 *by* Dr. Kakoli Bose (PI/ Assistant Professor, ACTREC, TMC, Kharghar- 410210, India)
8. Micro-organization and Plasticity of Auditory Cortical Circuits *by* Dr. Sharba Bandyopadhyay (National Brain Research Centre, Manesar, Haryana)
9. Molecular and functional characterization of replication initiator protein (Rctb) of Vibrio cholerae chromosome II *by* Dr. Jyoti K. Jha (Visiting Fellow, Laboratory of Biochemistry, NCI/CCR/NIH, 37 Convent Drive, Building 37, Room 6044, MSC 4260, Bethesda, USA)
10. Syndecan-4 Proteoliposomes Enhance Revascularization and Wound Healing by Overcoming Growth Factor Resistance *by* Mr. Subhamoy Das (Graduate Student, Cardiovascular Bioengineering and Therapeutics Lab, Dept. of Biomedical Engineering, University of Texas, Austin)

11. Development of Nanocatalysts for Fuels using Micro-channel and Tubular Reactors *by* Dr. Debasish Kuila (Professor and Head, NSF-CREST Bioenergy Center, North Carolina A & T State University, Greensboro, USA)
12. Cryogel Biomaterials for Biomedical Applications *by* Prof. Ashok Kumar (Dept. of Biotechnology, IIT Kanpur)

#### ***Doctoral and MS Degrees Awarded***

1. Mr. Debasish Mishra (07BT9707) : Osteoblast Microtissues As Profunfunctional Modules for Improved Cell based Bone Tissue Engineering(Ph.D.)
2. Mr. Debajyoti Dutta (07BT9706) : Crystal Structure of Mycobacterial and Staphylococcal Ketoacyl Reductase and their Structure-Function Relationship(Ph.D.)
3. Ms. Sunita Nayak (08BT9703) : Characterization of silk sericin for potential biomedical applications(Ph.D.)
4. Mr. Sudipta Bhattacharyya (07BT9401) : Crystal structure based functional analysis of Staphylococcal dual specific Inositol monophosphatase/ NADP (H) Phosphatase(Ph.D.)
5. Ms. Namita Khanna (07BT9710) : Strain development and determination of suitable process parameters for maximization of hydrogen production using *Enterobacter cloacae* IIT-BT08(Ph.D.)

#### ***Member - Professional Bodies***

1. Ghosh, Sudip Kumar, *Life Member* - Indian Science News Association
2. Ghosh, Sudip Kumar, *Life Member* - Society of Biological Chemists, India
3. Sar, Pinaki, *Regular* - American society for microbiology
4. Sar, Pinaki, *Annual member* - Japanese society for microbiology
5. Sar, Pinaki, *Regular* - European federation of biotechnology
6. Sar, Pinaki, *Regular with online and print journal subscription* - International society for microbial ecology (ISME)
7. Sen, Ramkrishna, *Life member* - Indian Institute of Chemical Engineers (IChE)
8. Sen, Ramkrishna, *Founding member* - Global Biorenewables Research Society (www.gbrsociety.org)
9. Sen, Ramkrishna, *Member* - Asian Federation of Biotechnology
10. Sen, Ramkrishna, *Member* - European Federation of Biotechnology
11. Ghosh, Anindya Sundar, *Regular* - American Society for Microbiology (ASM)
12. Ghosh, Anindya Sundar, *Associate Member* - Horticultural Society of India
13. Ghosh, Anindya Sundar, *Life member* - Society for Biological Chemists, India
14. Ghosh, Anindya Sundar, *Life member* - Physiological Society of India
15. Ghosh, Anindya Sundar, *Ordinary member* - Society of General Microbiology (SGM), UK
16. Ghosh, Anindya Sundar, *Member* - International Society of Travel Medicine (ISTM)
17. Maiti, Mrinal Kumar, *Member* - Asian Federation of Biotechnology
18. Maiti, Mrinal Kumar, *Life Member* - Plant Physiology Forum, Kolkata
19. Maiti, Mrinal Kumar, *Life Member* - Institute of Science, Education and Culture (ISEC) Kolkata
20. Maiti, Mrinal Kumar, *Life Member* - Society for Plant Biochemistry & Biotechnology, IARI, New Delhi
21. Maiti, Mrinal Kumar, *Regular* - American Society of Plant Biologists
22. Bahadur, Ranjit Prasad, *Member* - Asian Federation of Biotechnology
23. Bahadur, Ranjit Prasad, *Life member* - Indian Science Congress Association
24. Das, Debabrata, *Life member* - Indian Society for Technical Education (ISTE)
25. Das, Debabrata, *Regular Member* - International Association of Hydrogen Energy (IAHE)
26. Das, Debabrata, *Life member* - Indian Institute of Chemical Engineers (IChE)
27. Das, Debabrata, *Life member* - The Institution of Engineers (India) (IE)

28. Das, Debabrata, *Life member* - Association of Food Scientists & Technologists (India) (AFST)
29. Dey, Satyahari, *Member* - Society for Biotechnology Japan
30. Dey, Satyahari, *Member* - Phytochemical Society of Europe
31. Dey, Satyahari, *Member, Executive Board* - Assian Federation of Biotechnology
32. Dey, Satyahari, *Life member* - Society for Plant Biochemistry & Biotechnology
33. Ghosh, Ananta Kumar, *Life member* - Physiological Society of India
34. Ghosh, Ananta Kumar, *Regular* - Biotechnology Society of India
35. Das, Amit Kumar, *Life* - National Crystallographic Society
36. Das, Amit Kumar, *Member* - ASM
37. Kundu, Subhas Chandra, *Elected Member, Asia Specific* - Tissue Engineering and Regenerative Medicine, International Society
38. Kundu, Subhas Chandra, *Life Member* - All India Cell Biology Society

### ***Member - Editorial Board***

1. Bahadur, Ranjit Prasad (2010) *Editorial board member* - Journal of Computational Biology and Bioinformatics Research
2. Bahadur, Ranjit Prasad (2011) *Editorial Board Member* - ISRN Biomathematics
3. Das, Debabrata (2013) *Member of the Editorial board* - International Journal of Hydrogen Energy
4. Das, Debabrata (2013) *Member of the Editorial board* - Indian Journal of Biotechnology
5. Das, Debabrata (2013) *Editor-in-Chief* - American Journal of Biomass and Bioenergy
6. Das, Debabrata (2013) *Member of the Editorial board* - Biotechnology for Biofuels
7. Ghosh, Anindya Sundar (2011) *Board Member* - International Journal of BioSciences and Technology IJBST
8. Kundu, Subhas Chandra (2008) *Editorial Board Member* - Biomaterials
9. Kundu, Subhas Chandra (2012) *Editorial Board Member* - Journal of Biological Engineering
10. Kundu, Subhas Chandra (2012) *Editorial Board Member* - Journal of Regenerative Medicine and Tissue Engineering
11. Kundu, Subhas Chandra (2011) *Editorial Board Member* - World Journal of Stem Cells
12. Kundu, Subhas Chandra (2012) *Editorial Board Member* - Biomedical Materials
13. Sen, Ramkrishna (2013) *Guest Editor and Editorial Board Member* - BioMed Research International (Impact Factor - 2.88)
14. Sen, Ramkrishna (2011) *Member* - Journal of Microbial & Biochemical Technology
15. Sen, Ramkrishna (2010) *Member* - International Journal of Biosciences and Technology (ISSN: 0974-3987)

### ***Sponsored Research Projects***

1. A Dissection of macromolecular interactions in cellular assemblies (ISIRD (completed), Rs.5.00 Lakhs)
2. Algae mediated biosequestration and storage of CO<sub>2</sub> (Bio-CCS) from coal-based flue gas.....and animal feed application (West Bengal Department of Science and Technology, Rs.27.39 Lakhs)
3. Analysis of macromolecular interactions in ribosome: implication to its self assembly Sponsor:Submitted (DST (ongoing), Rs.18.60 Lakhs)
4. Assessment of microbial communities and their biodegradation potentials in petroleum hydrocarbon contaminated environments in Assam (Department of Biotechnology, Rs.62.00 Lakhs)
5. Biofuel production in a biorefinery concept (PBC) (P K Sinha Center for Bioenergy - IIT Kharagpur, Rs.3.00 Lakhs)
6. Biofuels from marine microalgae (BMM) (CSIR (under NMITLI program), Rs.59.30 Lakhs)
7. Bioinformatics SUB-DIC (DBT, New Delhi, Rs.12.50 Lakhs)

8. Bioprocess development and bioreactor strategies for the ..... probiotic endospores for the lab scale manufacture of nutraceuticals (MNF) - Complete (CSIR, Rs.16.00 Lakhs)
9. Bioprocess development and optimization for the enhanced production of biosurfactants of marine origin for healthcare and commercial applications (HCA (DBT, Rs.36.16 Lakhs)
10. Bioprospecting of antarctic flora: screening of novel genes and healthcare molecules (Ministry of Earth Sciences, Rs.105.96 Lakhs)
11. Biotechnology based value addition of neem and jatropha leaves, oilcakes and oil (NOVOD, Rs.11.00 Lakhs)
12. Characterization of arsenic oxidizing bacteria from contaminated groundwater and their mechanisms of arsenite oxidation process for potential application (Council of Scientific and Industrial Research, Rs.27.30 Lakhs)
13. Characterization of a novel short chain dehydrogenase reductase (SDR) family enzyme involved in fatty acid metabolism in *M. tuberculosis* and structure (DBT, GoI, Rs.76.70 Lakhs)
14. Characterization of encystation specific kinase(s) of *Entamoeba* during encystation (DBT, Rs.35.98 Lakhs)
15. Continuous process for enzymatic biofuel production - Grant for exchange visit and project formulation - Completed (DST (India)-CNPq (Brazil), Rs.1.50 Lakhs)
16. Crystal structure determination, kinetic and biophysical characterization of glyceraldehyde 3 phosphate dehydrogenase from MRSA 252 (BRNS - DAE, Rs.3140500.00 Lakhs)
17. Development and characterization of ecofriendly jute geo-composites (EFB) (JMDC, Rs.67.00 Lakhs)
18. Development of fluorescent whole cell optical fibre biosensor for heavy metal pollutants (DBT, Rs.31.79 Lakhs)
19. Development of multifunctional dendritic polymers for injectable bone tissue engineering (DBT, Rs.43.44 Lakhs)
20. Development of pod borer resistant transgenic pigeon pea and chickpea (ICAR, Rs.197.00 Lakhs)
21. Development of sensitive diagnostic kit for the detection of pathogens in stored food grains (MHRD, Rs.99.99 Lakhs)
22. Development of water-repellant and durable jute geotextiles (JGN) (JMDC, Rs.170.00 Lakhs)
23. Dielectrophoretic separation of biological cells in microfluidic channels. (NPMASS programme Cell, Rs.10.35 Lakhs)
24. Effects of auxiliary membrane components on biofilm formation in *Escherichia coli* (Council of Scientific and Industrial Research (CSIR), Rs.24.76 Lakhs)
25. Engineered silk matrices for optimization of in vitro 3-D tumor model (ICMR, New Delhi (sanctioned), Rs.46.90 Lakhs)
26. Enhanced production and purification of a marine lipopeptide.....breast cancer therapy (BCT) (MoES, Rs.100.36 Lakhs)
27. Exploration of microbial diversity and function in acid mine drainage and mine tailings: An integrated geomicrobiological approach for bioremediation (Department of Biotechnology, Rs.46.00 Lakhs)
28. Exploration of microbial diversity and microbial role in arsenic mobilization in As-contaminated groundwater of North Eastern states (Arunachal Pradesh (Department of Biotechnology, Rs.68.28 Lakhs)
29. Extraction, characterization and optimized production of biopigment from *Amaranthus tricolor* (ACA) - Completed (DBT, Rs.24.41 Lakhs)
30. Food security through reduced dietary intake: Low cost nutraceutical development from rice, wheat and coarse grain (MHRD/Govt. of India, Rs.101.10 Lakhs)
31. Functional characterization of soluble penicillin-binding protein 6 of *E. coli* (Department of Science and Technology, Govt. of India, Rs.22.86 Lakhs)
32. Genomics-supported screening of aromatic rice cultivars with high yielding potentiality for growing in local agro-climatic zones (MHRD/Govt. of India, Rs.105.90 Lakhs)
33. High rate algal biomass production for food, feed, biochemicals and biofuels (Department of Biotechnology, Rs.66.56 Lakhs)

34. Identification and characterisation of *Phaseolus vulgaris* microRNAs differentially expressed in biotic and abiotic stress conditions by deep sequen (DBT (ongoing), Rs.2.99 Lakhs)
35. Improvement of energy recovery from waste water by dark fermentation followed by microbial fuel cells (DRDO, Rs.42.41 Lakhs)
36. Indian origin silk based biomimetic scaffolds for engineering of load-bearing tissue (Department of Biotechnology, New Delhi, Rs.54.45 Lakhs)
37. Integrating large scale biohydrogen production and hydrogen fuel cell for sustainable power generation (DRDO, Rs.9.99 Lakhs)
38. Isolation and characterization of antifungal peptides from muga silkworm *Antheraea assamensis* Helfer (DBT, Rs.34.90 Lakhs)
39. Molecular analysis of efflux pump mediated antibiotic resistance in Gram negative bacilli (Department of Biotechnology, Govt. of India, Rs.87.65 Lakhs)
40. Molecular and structural analysis of *Antheraea mylitta* cytoplasmic polyhedrosis virus RNA dependent RNA polymerase. (DST, Rs.39.70 Lakhs)
41. Molecular characterization of DacD (a putative DD-carboxypeptidase) of *Escherichia coli* (DBT, Rs.20.86 Lakhs)
42. Molecular characterization of leptin in Indian major carps (DBT, Rs.28.00 Lakhs)
43. Molecular characterization of penicillin-interactive enzymes (Low Molecular Mass) of *Mycobacterium smegmatis* (Council of Scientific and Industrial Research (CSIR), New Delhi, Rs.28.64 Lakhs)
44. Molecular Characterization of Putative DD-Carboxypeptidase of *Klebsiella pneumoniae* (SGIRG, SRIC , IIT Kharagpur, Rs.25.00 Lakhs)
45. Molecular characterization of the emerging beta-lactamases in Gram negative bacilli (Department of Biotechnology, Rs.100.51 Lakhs)
46. Molecular cloning and characterization of *Antheraea mylitta* cytoplasmic polyhedrosis virus genome segments 4 and 5 (CSIR, Rs.29.00 Lakhs)
47. Molecular Structural analysis of A *mylitta* cytoplasmic polyhedrosis virus RNA dependent RNA polymerase (DST-SERB, GoI, Rs.3970000.00 Lakhs)
48. North Eastern origin silk protein based matrices and nano/microparticles for biomedical applications (Department of Biotechnology, New Delhi, Rs.118.35 Lakhs)
49. Nutritional enhancement of rice bran oil through metabolic engineering of fatty acid biosynthesis (CSIR/Govt. of India, Rs.22.82 Lakhs)
50. P K Sinha Center for Bioenergy (PKS) (IIT Foundation) (Dr. Prabha Kant Sinha), Rs.400.00 Lakhs)
51. Peripheral nerve regeneration on silk matrices (British Council, Rs.13.00 Lakhs)
52. Potential use of biosurfactants for medical applications (PBM) (DST (under Indo-Portugal Collaboration Program), Rs.4.14 Lakhs)
53. Protein-protein interface targeted drug designing (DBT - New Delhi, Rs.3060000.00 Lakhs)
54. Reducing accumulation of toxic metals or metalloids in rice grains by RNAi-mediated gene silencing approach (DBT/Govt. of India, Rs.29.81 Lakhs)
55. Role of Penicillin-binding proteins and O-antigens in the development of beta-lactam antibiotic resistance in Gram negative bacteria (Indian Council of Medical Research (ICMR), Rs.17.40 Lakhs)
56. Silk Protein mediated surface modification of NiTi alloy based stent material for improved endothelialization and reduced thrombogenicity (DBT, Rs.34.05 Lakhs)
57. Silk Protein/Blend Matrices in Tissue Engineering & Biotechnological Applications (Department of Science & Technology, Rs.41.43 Lakhs)
58. Silk scaffolds for peripheral nerve regeneration (British High Commission (UKIERI), Rs.13.99 Lakhs)
59. Structural and functional analysis of flavin dependent acyl CoA dehydrogenases of the *igr* operon from *M. tuberculosis* (Indo-Austria) (DST, GoI, Rs.3.00 Lakhs)
60. Targeted metabolomics-based selection of superior scented rice cultivars appropriate for growing in local agro-climatic zones (MHRD/Govt. of India, Rs.100.04 Lakhs)
61. Technology Mission Mode Project on “Hydrogen Production through Biological Routes□?” (MNRE, Govt. of India, Rs.287.00 Lakhs)



62. Understand the Structural Mechanism of Function of Intrinsically Disordered Proteins and their Association with Diseases (IITKGP (SGIRG), Rs.25.00 Lakhs)
63. Understanding plant growth promoting traits of rhizospheric and endophytic microbes through metagenomics approach (SRIC (SGIRG), IIT-Kharagpur, Rs.25.00 Lakhs)
64. Whole cell modeling and simulation in bacterium Escherichia coli (SRIC (SGIGC), IIT-Kharagpur, Rs.250.00 Lakhs)

### ***Consultancy Projects***

1. Alcohol Loss Calculation during Transfer and Despatch Operation in the Distillery Plant of M/s IFB Agro Industries Ltd., Noorpur (M/s IFB Agro Industries Ltd., Noorpur, Rs.2.00 Lakhs)
2. Biocatalyst based continuous production of biodiesel (PfP Technology LLC., Houston, Texas, USA, Rs.11.00 Lakhs)
3. Calculation alcohol loss in the Distillery Plant (IFB Agro Industries Ltd., Noorpur, Rs.4.00 Lakhs)
4. Establishment of Biotechnology Park Kharagpur: Concept paper (WBIDC, Rs.27.00 Lakhs)
5. Validation trial for bioethanol production (VTBP) - Completed (DSS Corp., Kolkata, Rs.0.25 Lakhs)

### ***Patents (filed / granted)***

1. 1,4 triazole based polyphenol hybrids - in vitro inhibition of M. tuberculosis b-ketoacyl reductase FabG4 9Rv0242c) by Debranjana Banerjee, D Dutta, B Saha, A K Das, Amit Basak
2. A biofuel additive for diesel engines
3. A novel microbial carbon capture cell design for simultaneous wastewater treatment and CO<sub>2</sub> biofixation
4. An antihyperglycemic EPS from a spore-forming probiotic bacterium, B. coagulans RK-02, and its preparation method thereof
5. An efficient, cost-effective, reusable and eco-friendly algal biomass dewatering system and an accelerated adsorption process thereof
6. Anticancer cyclic peptide from sandalwood and synthesis of the same
7. Antimicrobial peptide from jatropa
8. Bio-diesel additive for diesel engine
9. Continuous bio-catalytic production of bio-diesel in an integrated CSTR-PBR operation
10. Cost-effective natural salt formulation for sea water substitution, ..... precipitation thereof
11. Durability enhancement of lignocellulosic fibers by vegetable oil treatment
12. Earthen material based cathode separator assembly for scalable bioelectrochemical system.
13. Methods of Optimally Harvesting Electrical Power from Parallel Stacked Microbial Fuel Cells and Reliably Dispatching to End-Use Applications.
14. Microbial transformation of lignocellulosic fibers using eco-friendly reagents for strength and durability enhancement
15. Natural resins and the use thereof for the production of jute fiber reinforced composites
16. Probiotic spore based novel drug delivery system
17. process for prebiotic oligosaccharide production

### **Visits Abroad by Faculty Members**

1. Ghosh, Anindya Sundar - FEMS 2013 conference (Leipzig, Germany, ) July 19- 26, 2013
2. Das, Debabrata - Invited talk on Carbon dioxide sequestration by algae and its challenges (Jiao Tong University, Shanghai, ) 1 hr.
3. Das, Debabrata - To chair the Biohydrogen Sessions and to Deliver Plenary lecture in the WHTC-2013 (WHTC-2013, Shanghai, ) 4 hrs. and 30 min.

4. Kundu, Subhas Chandra - Discussion for ongoing research work and guest lecture (The Curtin University, Australia, ) 12-15 May, 2013
5. Kundu, Subhas Chandra - To present Research Paper (British Columbia University, Canada, ) 3-6 June
6. Kundu, Subhas Chandra - Ongoing research discusiion and seminar (The University of Sydney, ) 16-18 May,2013
7. Kundu, Subhas Chandra - Invited lecture and reserach collaboration (National University of Singapore, Singapore, ) 19-20 May
8. Kundu, Subhas Chandra - UK-US-India Project Work (Wake Forest Medical University, US, ) 1-4 July, 2013
9. Kundu, Subhas Chandra - To present Keynote address at TERMIS-AP (Shanghai, ) 21-27 October, 2013
10. Dey, Satyahari - attending SIVB2013 (USA, ) June 15-19, 2013

### **Invited Lectures by Faculty Members**

1. Early events of Entamoeba encystation *by* Ghosh, Sudip Kumar (JNU, New Delhi)
2. Cyst wall synthesis and encystation signaling in Entamoba *by* Ghosh, Sudip Kumar (NIT Durgapur)
3. Hydration of protein-RNA recognition sites *by* Bahadur, Ranjit Prasad (IIT Kharagpur)
4. A Perspective on Structural Bioinformatics *by* Bahadur, Ranjit Prasad (Vidyasagar University)
5. Structure of FabG4 and strategies o for Fabg4 inhibitor designing *by* Das, Amit Kumar (Vizag and Arraku Valley (GRC-2013))
6. Crystal structure of FabG-a beta ketoacyl reductase involved in fatty acid biosynthetic pathway *by* Das, Amit Kumar (JNU, New Delhi (42 nd National seminar on crystallography))
7. Metabolic Engineering in Microbial Cell Factory: A Systems Approach *by* Maiti, Mrinal Kumar (IIT-Kharagpur (in the short term course on Computational Systems Biology))
8. Recent trends and promises in plant biotechnology, an Indian scenario *by* Maiti, Mrinal Kumar (Madurai Kamaraj University, Madurai)
9. Microbes: Essential & Influential Roles in our daily life *by* Maiti, Mrinal Kumar (Jawahar Navodaya Vidyalaya, Medinipur)
10. Bacterial biomineralization : Insights from ‘genomics approaches *by* Sar, Pinaki (National Institute of Technology, Durgapur)
11. Bioremediation and genomics *by* Sar, Pinaki (Visvabharti University, Santiniketan)
12. Microbial diversity and bioremediation: Insights from omics approaches *by* Sar, Pinaki (National Institute of Technology Rourkela)
13. Cleaning up with genomics : Evaluating microbial potential in bioremediation *by* Sar, Pinaki (Centre for Science and Environment, New Delhi)
14. Biohydrogen: a green fuel for the future *by* Das, Debabrata (Short Term Course on RENEWABLES IN SCIENCE AND ENGINEERING (RISE-2014), NIT Silchar)
15. Fermentation biotechnology: Principles, Processes and Products *by* Das, Debabrata (National Workshop on “Current trends of biological research at crossroads of science□?, IIT Kharagpur)
16. Advances in biohydrogen production processes: present state of art *by* Das, Debabrata (National Convention of National Renewable Energy Fellows (NREF) MNRE, New Delhi)
17. Biohydrogen as zero carbon and pollution free fuel for the future: present state of art *by* Das, Debabrata (The 5th India-Korea Joint Workshop on Bioenergy, Trivandrum)
18. Biohydrogen Production from Organic Wastes for the Sustainable Renewable Energy Generation *by* Das, Debabrata (5th World Hydrogen Technologies Convention (WHTC-2013), Shanghai)
19. Sustainable Energy Generation through Bio Hydrogen production processes *by* Das, Debabrata (2nd International Conference on Hydrogen and Fuel Cell, Goa)

20. Carbon dioxide sequestration by algae and its challenges *by* Das, Debabrata (Jiao Tong University, Shanghai)
21. Natural biopolymers: Fibroin and Sericin *by* Kundu, Subhas Chandra (Indian Institute of Space Technology, Trivandram)
22. Silk as biomedical materials for tissue engineering and regenerative medicine *by* Kundu, Subhas Chandra (Curtin University, Australia)
23. Non-mulberry silk as biomedical materials for regenerative medicine *by* Kundu, Subhas Chandra (The University of Sydney)
24. Non-mulberry silk as biomedical materials for tissue regeneration *by* Kundu, Subhas Chandra (NUS, Singapore)
25. Point of Care Microfluidic Platform for Cancer Detection *by* Maiti, Tapas Kumar (Kolaghat Engineering college)
26. Microscale Engineering in 3D Cell Culture *by* Maiti, Tapas Kumar (NIT Durgapur)
27. Molecular characterization of cypovirus infecting tasar silk worm. *by* Ghosh, Ananta Kumar (Haldia Institute of Technology)
28. DNA Fingerprinting *by* Ghosh, Anindya Sundar (Assam University , Silchar)

### ***Books Published***

1. Debabrata Das, Namita Khanna and Chitralekha NagDasgupta: Biohydrogen Production: Fundamentals and Technology Advances *published by* CRC Press, Taylor & Francis Group, Florida (2014)

### ***Papers Published in Journals***

1. Advance Workshop Report on Evaluation of Hydrogen Producing Technologies for Industry Relevant Application, ARCI, Hyderabad, India, 8-9 February 2013 *By* Borse P and Das D *International Journal of Hydrogen Energy* 38, 11470-11471, (2013)
2. Differential contributions of the latch in Thermotoga maritima reverse gyrase to the binding of single-stranded DNA before and after ATP hydrolysis *By* Del Toro Duany Y, Ganguly A and Klostermeier D *Biol Chem* 395 (2014)
3.  $\beta$ -Glucan from Edible Mushroom (*Pleurotus florida*) Enhances Mucosal Immunity in Poultry *By* Gopi Muthusamy, Siddhartha Narayan Joardar, Indranil Samanta, Devi Prasad Isore, Barun Roy, Tapas Kumar Maiti *Advances in Animal and Veterinary Sciences* 1 (4): 116 – 119 (2013)
4. Isolation and characterization of extracellular polysaccharide thelebolan produced by a newly isolated psychrophilic Antarctic fungus *Thelebolus*. *By* Sourav K. Mukhopadhyay, Soumya Chatterjee, Samiran S. Gauri , Shibendu S. Das, Abheepsa Mishra, Moumita Patra, Ananta K. Ghosh, Amit K. Das, Shiv M. Singh, Satyahari Dey *Carbohydrate Polymers* 104,204-12. (2014)
5. A heteropolysaccharide from an edible hybrid mushroom pfl 1p: structural and immunostimulating studies. *By* Maity, S., Bhunia, S. K., Sen, I. K., E. K., Mandal, K., Maity, Behera, B., Maiti, T. K., Mallick, P., Sikdar, S. R., Islam, S., S., *Carbohydrate Research*. 374, 89-95 (2013)
6. A novel in vivo platform for studying alveolar bone regeneration. *By* Kim, J H. Moon, T. Kim, J. Jo, S. Yang, D. Naskar, S C. Kundu, W. Chrzanowski, Hae-Won Kim *Journal of Tissue Engineering* 4, 1-10 (2014)
7. Angucycline C5 Glycosides: Regio- and Stereocontrolled Synthesis and Cytotoxicity *By* Mitra, P., Behera, B., Maiti, T. K., Mal, D. *The Journal of Organic Chemistry*. 78, 9748-9757 (2013)
8. Biohydrogen production by dark fermentation, WIREs Energy Environ 2013 *By* Khanna N and Das D *WIREs Energy Environ* 2, 401–421 (2013)
9. Carbon dioxide sequestration from industrial flue gas by *Chlorella sorokiniana* *By* Kumar K, Banerjee D and Das D *Bioresource Technology* 152, 225-233 (2014)

10. Characterization of culturable bacterial communities in petroleum hydrocarbon contaminated sludge of oil refineries and oil exploration sites By Ajoy Roy, Siddhartha Pal, Sufia K. Kazy, Poulomi Sarkar, Pinaki Sar and Alope K. Ghoshal *Journal of Environmental Research And Development* Vol. 8: 451-458 (2014)
11. Cloning, expression, crystallization and preliminary X-ray diffraction studies of Staphylococcal superantigen-like protein 1 By Dutta D, Dutta A, Bhattacharjee A, Basak A and Das, A K. *Acta Crystallogr Sect F Struct Biol Cryst Commun.* Accepted (2014)
12. Cloning, overexpression, purification, crystallization and preliminary X-ray diffraction analysis of Rv0241c (HtdX) from Mycobacterium tuberculosis H37Rv. By Biswas R, Dutta D, Das AK. *Acta Crystallogr Sect F Struct Biol Cryst Commun* 69:1110-3. (2013)
13. Complete genome sequence of Enterobacter sp. IIT-BT 08: A potential microbial strain for high rate hydrogen production By Khanna N, Ghosh AK, Huntemann M, Deshpande S, Han J, Chen A, Kyripides N, Mavrommatis K, Szeto E, Markowitz V, Ivanova N, Pagani I, Pati A, Pitluck S, Nolan M, Woyke T, Teshima H, Chertkov O, Daligault H, Davenport K, Gu W, Munk C, das d, et al. *Standards in Genomic Sciences* 9: 359-369 (2013)
14. Continuous mode of carbon dioxide sequestration by *C. sorokiniana* and subsequent use of its biomass for hydrogen production by *E. cloacae* IIT-BT, By Kumar K, Roy S and Das D *Bioresource Technology* 145: 116-122 (2013)
15. Copper (II) complexes of piperazine based ligand: Synthesis, crystal structure, protein binding and evaluation of anti-cancerous therapeutic potential. By Pait M, Kundu B, Kundu S C and Ray D. *Inorganica Chimica Acta* Accepted (2014)
16. Cyanobacteria as a valuable source of antiviral, antibacterial and antifungal compounds – an overview By Mukherjee, G, Nayak BK and Das D *Algological Studies Journal* 143: 3-25 (2013)
17. Design, synthesis and characterization of novel inhibitors against mycobacterial  $\beta$ -ketoacyl CoA reductase FabG4 By Banerjee DR, Dutta D, Saha B, Bhattacharyya S, Senapati K, Das AK, Basak A. *Org. Biomol. Chem* 12:73-85 (2014)
18. Designing a thiol specific fluorescent probe for possible use as a reagent for intracellular detection and estimation in blood serum: kinetic analysis to probe the role of intramolecular hydrogen bonding By Das P, Mandal AK, Reddy G U, Baidya M, Ghosh SK, Das A *Org Biomol Chem. Oct 14* 11(38):6604-14 (2013)
19. Dipeptidyl peptidase-IV inhibitors used in type-2 diabetes inhibit a phospholipase C: a case of promiscuous scaffolds in proteins By Sandeep Chakraborty, Adela Rendón-Ramírez, Bjarni Ósgeirsson, Mouparna Dutta, Anindya S. Ghosh, Masataka Oda, Ravindra Venkatramani, Basuthkar J. Rao, Abhaya M. Dandekar, Félix M. Goñi *FI1000 Research* [(doi: 10.12688/fi1000research.2-286.v1)] online (2014)
20. Engineered 3D silk based metastasis models: Interactions between human breast adenocarcinoma, mesenchymal stem cells and osteoblast-like cells By Talukdar S, Kundu SC *Advanced Functional Materials* 23, 5249-5260 (2013)
21. Expression, purification, crystallization and preliminary X-ray diffraction studies of phosphoglycerate mutase from Staphylococcus aureus NCTC8325 By Roychowdhury A, Kundu A, Gujar A, Bose M and Das AK *Acta Crystallogr Sect F Struct Biol Cryst Commun.* 70:53-56 (2014)
22. Facile preparation of multifunctional hollow silica nanoparticles and their cancer specific targeting effect By Banalata Sahoo, K. Sanjana P. Devi, Sumanta Kumar Sahu, Suryakanta Nayak, Tapas K. Maiti, Dibakar Dhara, Panchanan Pramanik *Biomaterials Science* 1 (2013) 647-657 (2013)
23. Flexible and transparent nanocrystal loading gate memory devices using silk protein By Bera S, Mondal S P, Naskar D, Kundu S C and S Ray *Organic Electronics* Accepted (2014)
24. Fluorescent photoremovable precursor (acridin-9-ylmethyl)ester: synthesis, photophysical, photochemical and biological applications By Jana A, Saha B, Karthik S, Barman S, Iqbal M, Ghosh SK, Pradip Singh ND *Photochem. Photobiol. Sci.* 12(6):1041-52 (2013)
25. Folate conjugated silk fibroin nanocarriers for targeted drug delivery By Subia B, Chandra S, Talukadr S and Kundu SC *Integr. Biol* 6, 203 – 214 (2014)

26. Functional characterization of two structurally novel diacylglycerol acyltransferase2 isozymes responsible for the enhanced production of stearate-rich storage lipid in *Candida tropicalis* SY005 By Prabuddha Dey, Monami Chakraborty, Maulik R. Kamdar and Mrinal K. Maiti *PLoS ONE* 9(4): e94472 (2014)
27. Graphene Oxide-Impregnated PVA–STA Composite Polymer Electrolyte Membrane Separator for Power Generation in a Single-Chambered Microbial Fuel Cell By Khilari S, Pandit S, Ghangrekar MM, Pradhan D and Das D. *Industrial & Engineering Chemistry Research* 52 (33): 11597–116 (2013)
28. Graphene supported  $\alpha$ -MnO<sub>2</sub> nanotubes as cathode catalyst for improved power generation and wastewater treatment in single-chambered microbial fuel cells By Khilari S, Pandit S, Ghangrekar MM, Das D and Pradhan D. *Royal Society of Chemistry Advances* 3, 7902-7911 (2013)
29. Hydration of protein-RNA recognition sites. By Barik A and Bahadur RP *Nucleic Acids Res.* accepted (revision) (2014)
30. Identification and characterization of metabolic properties of bacterial populations recovered from arsenic contaminated ground water of North East India (Assam) By Soma Ghosh, Pinaki Sar *Water Research* 47:6992-7005 (2013)
31. Identification and Structural Characterization of a new Pro-apoptotic Cyclic Octapeptide Cyclosaplin from Somatic Seedlings of *Santalum album* L.. By Abheepsa Mishra, Samiran S. Gauri, Sourav K. Mukhopadhyay, Soumya Chatterjee, Shibendu S. Das, Santi M. Mandal, Satyahari Dey. *Peptides* 54 ,148-58. (2014)
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33. Improvement of carbon dioxide sequestration in photo-bioreactor using *Anabaena* sp. PCC 7120 By Nayak B.K. and Das D *Process Biochemistry* 148: 1126-1132 (2013)
34. In vitro and in vivo antitumor effects of Peanut agglutinin through induction of apoptotic and autophagic cell death By Mukhopadhyay, S., Panda, P. K., Behera, B., Das, C. K., Hassan, M. K., Das, D. N., Sinha, N., Bissoyi, A., Pramanik, K., Maiti, T. K., Bhutia, S. K *Food and Chemical Toxicology* 64, 369-377 (2014)
35. International Conference on Advances in Biological Hydrogen Production and Applications (ICABHPA 2012) By Laksmi Narasu M, Himabindu V, Das D *International Journal of Hydrogen Energy* 38, 6010-2 (2013)
36. International Conference on Algal Biorefinery: A potential source of food, feed, biochemicals, biofuels and biofertilizers (ICAB 2013) By Das D *International Journal of Hydrogen Energy* 38, 5410-7 (2013)
37. Isolation and characterization of extracellular polysaccharide Thelebolan produced by a newly isolated psychrophilic Antarctic fungus *Thelebolus* Carbohydrate Polymers By Mukhopadhyay SK, Chatterjee S, Gauri SS, Das SS, Mishra A, Patra M, Ghosh AK, Das AK, Singh SM, Dey S. *Carbohydrate polymer* 104:2040212 (2014)
38. Manganese cobaltite/polypyrrole nanocomposite-based air-cathode for sustainable power generation in the single-chambered microbial fuel cells By Khilari S, Pandit S, Das D and Pradhan D. *Biosensors and Bioelectronics* 54, 534-540 (2014)
39. Microbial communities in uranium mine tailings and mine water sediment from Jaduguda U mine, India: A culture independent analysis By Paltu K Dhal and Pinaki Sar *Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances and Environmental En* 49, 694–709 (2014)
40. Microbial Diversity in Uranium Deposits from Jaduguda and Bagjata Uranium Mines, India as revealed by clone library and Denaturing Gradient Gel Electrophoresis analyses By Ekramul Islam, Dhiraj Paul and Pinaki Sar *Geomicrobiology Journal* DOI:10.1080/01490451 (2014)
41. Modeling of Biomass Production by *Anabaena* under Varying Phosphate Concentrations and Light Regime, , 2013 By Nayak BK, Mukherjee G, Savitri RD, and Das D *American Journal of Biomass and Bioenergy* 2:41-52 (2013)

42. Molecular Modeling of protein-protein interaction to decipher the structural mechanism of non-host resistance in rice. By Basak J and Bahadur RP *Journal of Biomolecular Structure and dynamics* 32:669-681 (2013)
43. Multiple resistance mechanisms acting in unison in an Escherichia coli clinical isolate By Dhriti Mallik, Akash Kumar, Sujoy Kumar Sarkar and Anindya S Ghosh\* *Current Microbiology* 10.1007/s00284-013-0431-5. (2013)
44. Nanocomposites of bio-based hyperbranched polyurethane/functionalized MWCNT as non-immunogenic, osteoconductive, biodegradable and biocompatible scaffolds in bone tissue engineering By Beauty Das, Pronobesh Chattopadhyay, Debasish Mishra, Tapas Kumar Maiti, Somnath Maji, Rajan Narayan and Niranjana Karak *J. Mater. Chem. B*, 1, 4115-4126 (2013)
45. New chemodosimetric probe for the specific detection of Hg<sup>2+</sup> in physiological condition and its utilisation for cell imaging studies.. By 3. Saha S, Agarwalla H, Gupta H, Baidya M, Suresh E, Ghosh SK, Das A *Dalton Trans* 42(42):1 (2013)
46. Non-mulberry silk fibroin influence osteogenesis and osteoblast-macrophage cross talk on titanium based surface. By Naskar D, Nayak S, Dey T and Kundu S C. *Scientific Reports* 4, 4745 (2014)
47. Oscillatory shear stress induced calcium flickers in osteoblast cells By Bibhas Roy, Tamal Das, Debasish Mishra, Tapas K. Maitia and Suman Chakraborty *Integr. Biol* 6, 289-299 (2014)
48. PBP deletion mutants of Escherichia coli exhibit irregular distribution of MreB at the deformed zones By Saptha Vijayan, Sathi Mallik, Akash Kumar, Narayani M. and Anindya S. Ghosh\* *Current Microbiology*, 10.1007/s00284-013-0453-z 68:174–179 (2014)
49. Photocontrolled nuclear-targeted drug delivery by single component photoresponsive fluorescent organic nanoparticles of acridin-9-methanol By ana A, Saha B, Banerjee DR, Ghosh SK, Nguyen KT, Ma X, Qu Q, Zhao Y, Singh ND *Bioconjug. Chem.* 24(11):1828-39 (2011)
50. Photoresponsive quinoline tethered fluorescent carbon dots for regulated anticancer drug delivery By Karthik S, Saha B, Ghosh SK, Pradeep Singh ND, *Chem. Comm.* 49(89):10471-3 (2013)
51. Prediction and validation of apoptosis through cytochrome P450 activation by benzo[a]pyrene. By Das, D. N., Panda, P.K., Mukhopadhyay, S., Sinha, N., B., Mallick, Behera, B., Maiti, T. K., Bhutia, S. K. *Chemico-Biological Interactions* 208, 8-17 (2014)
52. Promiscuous scaffolds in proteins - non-native, non-additive and non-trivial By Sandeep Chakraborty, Bjarni Asgeirsson, Mouparna Dutta, Anindya S Ghosh, Masataka Oda, Adela Rendón, Felix Goñi, Jean-Marie Frere, Ravindra Venkatramani, Abhaya Dandekar, Basuthkar Rao *F1000 Research* 2:260 (2014)
53. Purification and characterization of a betanidin glucosyltransferase from *Amaranthus tricolor* L catalyzing non-specific biotransformation of flavonoids By Shibendu Sekhar Das, Samiran S. Gauri, Biswapriya Biswas Misra, Mousumi Biswas, Satyahari Dey. *Plant Science* 211, 61– 69 (2013)
54. Role of PI3K/Akt/mTOR and MEK/ERK pathway in Concanavalin A induced autophagy in HeLa cells By Bibhas Roy, Arup K. Pattanaika, Joyjyoti Dasa, Sujit K. Bhutia, Birendra Behera, Prashant Singha, Tapas K. Maitia, *Chemico-Biological Interactions* 210, 96–102 (2014)
55. Screening of serine protease inhibitors with antimicrobial activity using iron oxide nanoparticles functionalized with dextran conjugated trypsin and in silico analyses of bacterial serine protease inhibition. By 57. Mandal, S.M., Porto, W.F., De, D., Pule, A., Korpole, S., Ghosh, A. K., Roy, S.K. and Franco, O.L. *Analyst* 139: 464-472 (2013)
56. Sericin-carboxymethyl cellulose porous matrices as cellular wound dressing material By Nayak S, Kundu SC *J Biomedical Materials Part-A* online doi: 10.1002/ (2014)
57. Silk protein lithography as a route to fabricate sericin microarchitectures. By Kurland NE, Dey T, Wang C, Kundu SC, and Yadavalli VK *Advanced Materials* In press (2014)
58. Silk protein sericin nanoparticle based gene delivery By Das S, Dey T, and Kundu SC *RSC Advances* 4, 2137-2142 (2014)

59. Silk proteins for biomedical applications: bioengineering perspectives By Kundu B, Kurland NE, Subia B, Patra C, Engel FB, Yadavalli VK, Kundu SC *Progress in Polymer Science* 39, 251-267 (2014)
60. Silk sericin-alginate-chitosan microcapsules: Hepatocytes encapsulation for enhanced cellular functions By Nayak S, Dey S, Kundu SC *International Journal of Biological Macromolecules* 65, 258-266 (2014)
61. Structural and immunological studies of an exopolysaccharide from *Acinetobacter junii* BB1A. By Sen, I. K., Mandal, A. K., Chakraborty, R., Behera, B., Yadav, K. K., Maiti, T. K., Islam, S. S. *Carbohydrate Polymers* 101, 188-195. (2014)
62. Structural characterization of an immunoenhancing heteroglycan of a hybrid mushroom (pfls1h) of *Pleurotus florida* and *Lentinus squarrosulus* (Mont.) Singer. By Sen, I. K., Maji, P. K., Behera, B., Mallick, P., Maiti, T. K., Sikdar, S. R., Islam, S. S. *Carbohydrate Research*. 371, 45-51 (2013)
63. Structural elucidation of a biologically active heteroglycan isolated from a hybrid mushroom of *Pleurotus florida* and *Lentinula edodes* By Praloy K. Maji, Ipsita K. Sen, K. Sanjana P. Devi, Tapas K. Maiti, Samir R. Sikdar, Syed S. Islam *Carbohydrate Research*. 368, 22-28 (2013)
64. Structural studies of an immunoenhancing glucan of an ectomycorrhizal fungus *Ramaria botrytis*. By Bhanja, S. K., Rout, D., Patra, P., Nandan, C.K., Behera, B., Maiti, T. K., Islam, S. S. 374, 59-66 (2013)
65. Studies on arsenic transforming groundwater bacteria and their role in arsenic release from subsurface sediment By Angana Sarkar, Sufia K Kazy and Pinaki Sar *Environmental Science and Pollution Research* doi:10.1007/s11356-0 (2014)
66. Synthesis of novel four armed PE-PCL grafted superparamagnetic and biocompatible nanoparticles By Panja S, Saha B, Ghosh SK, Chattopadhyay S *Langmuir* 29(40):12530-40 (2013)
67. Synthesis, photochemistry, DNA cleavage/binding and cytotoxic properties of fluorescent quinoxaline and quinoxalinehydroperoxides. By Chowdhury N, Gangopadhyay M, Karthik S, Pradeep Singh ND, Baidya M, Ghosh SK *J PhotochemPhotobiol B* 130:188-9 (2014)
68. The attack of the phytopathogens and the trumpet solo: Identification of a novel plant antifungal peptide with distinct fold and disulfide bond pattern By Santi M. Mandal, William F. Porto, Prabhuddha Dey, Mrinal K. Maiti, Ananta K. Ghosh and Octavio L. Franco *Biochimie* 95:1939-1948 (2013)
69. Thermal and pH Responsive Polymer-tethered Multifunctional Magnetic Nanoparticles for Targeted Delivery of Anti-cancer Drug By Banalata Sahoo, K. Sanjana P. Devi, Rakesh Banerjee, Tapas K. Maiti, Panchanan Pramanik Dibakar Dhara *Applied Materials & Interfaces*, 5, 3884-3893 (2013)
70. Thermophilic biohydrogen production using pretreated algal biomass as substrate By Roy S, Kumar K, Ghosh S and Das D. *Biomass and Bioenergy* 61:157-166 (2014)
71. Thromboelastometric and platelet responses to silk biomaterials By Kundu B, Schlimp CJ, Nürnberger S, Redl H and Kundu SC. *Scientific Reports* Accepted (2014)
72. Use of image analysis tool for the development of light distribution pattern inside the photobioreactor for the algal cultivation By Kumar K, Sirasale A and Das D *Bioresource Technology* 143: 88-95 (2013)
73. Water Soluble Bioactives of Nacre Mediate Antioxidant Activity and Osteoblast Differentiation. By Ratna Chaturvedi, Prajjal Kanti Singha, Satyahari Dey. *Plos One* 8, e84584 (2014)

#### ***Papers Presented in Conferences***

1. A Vision-inspired Journey through the Global Challenges of Energy–Environment–Water & Food, By Ramkrishna Sen, *National Seminar on Trends in Environmental and Reaction Engineering (TREE - 2013)*, IIT Madras, (2013)

2. A comprehensive analysis of hydration of protein-RNA recognition sites., By Barik A and Bahadur RP., *Annual Conference of Indian Biophysical Society entitled Molecular Architecture, Dynamics and Assembly in Living Systems*, SINP, Kolkata, (2014)
3. A light-inspired journey through the challenges of biofuels with some relevant case studies, By Ramkrishna Sen, *International Symposium on New Horizons in Bioenergy Research (NHBR - 2013)*, IIT Kharagpur, (2013)
4. A structure-based binding affinity benchmark for protein-RNA complexes., By Nithin C and Bahadur RP., *Annual Conference of Indian Biophysical Society entitled Molecular Architecture, Dynamics and Assembly in Living Systems*, SINP, Kolkata, (2014)
5. Advances in biohydrogen production processes: present state of art, By Debabrata Das, *Workshop on Interdisciplinary research towards the development of modern food and bioprocess technology*, Jadavpur University, Kolkata, (2013)
6. Advances in biohydrogen production processes: present state of art, By Debabrata Das, *National Convention of National Renewable Energy Fellows (NREF)*, MNRE, New Delhi, (2013)
7. An approach to bacterial chromosome segregation system via partitioning proteins, By Bose M, Roychowdhury A, Das AK, *National Seminar on Crystallography (NSC42)*, Jawaharlal Nehru University (JNU) New De, (2013)
8. Biohydrogen as zero carbon and pollution free fuel for the future: present state of art, By Debabrata Das, *The 5th India-Korea Joint Workshop on Bioenergy*, Trivandrum, (2013)
9. Biohydrogen Production from Organic Wastes for the Sustainable Renewable Energy Generation, By Debabrata Das, *The Fifth World Hydrogen Technologies Convention (WHTC 2013)*, Shanghai, (2013)
10. Biohydrogen Production: A Journey Towards Commercialization, By Debabrata Das, *Asian Congress on Biotechnology*, New Delhi, (2013)
11. Characterization of Encystation specific kinase from Entamoeba invadens., By Biswajit Saha, Piyali Goswami, Sneha Susan Varghese and Sudip K. Ghosh, *Recent Treands in Molecular parasitology*, JNU, New Delhi, (2014)
12. Characterization of indigenous bacteria from oily sludge of petroleum refinery, By Ajoy Roy, Pinaki Sar and Kazy Sufia Khannam, *ICER 13*, Aurangabad, (2013)
13. Comprehensive gene expression analysis of SNAC1 gene from upland cultivar Oryza sativa L. ssp. Vandana into sensitive cultivar OsIR20 under soil moisture stress condition, By Yadav, S., Ghosh, S.K., Sen, S.K., *ASPB, Plant Biology 2014 Conference*, Portland, Oregon, USA, (2014)
14. Computational prediction of novel miRNA sequence and their targets in Cajanus Cajan., By Thomas A, Nithin C, Basak J and Bahadur RP., *Annual Conference of Indian Biophysical Society entitled Molecular Architecture, Dynamics and Assembly in Living Systems*, SINP, Kolkata, (2014)
15. Continuous thermophilic biohydrogen production using starchy wastewater, By Shantonu Roy, and Debabrata Das, *World Hydrogen Technology Conference 2013 (WHTC 2013)*, Shanghai, (2013)
16. Crystal structure determination of a hydroxy acyl CoA dehydratase, By Biswas R, Dutta D, Das AK., *National Seminar on Crystallography (NSC42)*, Jawaharlal Nehru University (JNU) New De, (2013)
17. Crystallization of glycerldehyde 3 phosphate dehydrogenase in different crystals forms, By Roychowdhury A, Mukherjee S, Das AK, *National Seminar on Crystallography (NSC42)*, Jawaharlal Nehru University (JNU) New De, (2013)
18. Cysteine conjugate poly [GMA-Co[mPEG300] copolymer forming unusual polymers in aqueous solution, By P. Laskar, Saha B, S.K. Ghosh and J. Dey, *Asian conference on Colloid and Interface Science*, North Bengal University, (2013)
19. Development of a drying protocol for lipid extraction from algal biomass, By Sinu Kumari, Debabrata Das and Nirupma Mallick, *Asian congress on biotechnology-2013*, New Delhi, (2013)



20. Dissecting macromolecular recognition sites in ribosomes., *By Pilla SP and Bahadur RP, Annual Conference of Indian Biophysical Society entitled Molecular Architecture, Dynamics and Assembly in Living Systems*, SINP, Kolkata, (2014)
21. Early events of Entamoeba encystation, *By Sudip Ghosh, Recent Trends in Molecular parasitology*, JNU, New Delhi, (2014)
22. Effect of carbon and nitrogen sources on hydrogen production using Enterobacter cloacae IIT-BT 08, *By Balachandar G and D Das., 5th World Hydrogen Technologies Convention (WHTC-2013)*, Shanghai, (2013)
23. Effect of parameters on CO<sub>2</sub> sequestration by green algae, *By Kumar, K., Das, D, New Horizons in Biotechnology (NHBT)*, HIT, Haldia, (2013)
24. Encystation specific mitogen activated protein kinases of Entamoeba invadens, *By Tanya Singh, Santoshi Nayak and Sudip K. Ghosh, Recent Trends in Molecular parasitology*, JNU, New Delhi, (2014)
25. enhanced Betalain production in liquid media by Amaranthus tricolor L. in Growtek bioreactor, *By S Dey Mousumi Biswas., SIVB 2013, June 2013 USA*, Rhode Islands, (2013)
26. Fermentation biotechnology: Principles, Processes and Products, *By Debabrata Das, National Workshop on "Current trends of biological research at crossroads of science*, IIT Kharagpur, (2013)
27. Functional characterization of DREB4 promoter element of Oryza nivara, a progenitor of cultivated rice, during moisture stress condition., *By Yadav , S., Ghosh, S. K., Sen, S. K., ASPB, Plant Biology 2013 Conference*, Providence, Rhode Island, USA., (2013)
28. Heterotrophic growth of Chlorella MJ 11/11 using thermophilic dark fermentative spent media for simultaneous biodiesel production and bioremediation, *By Supratim Ghosh, Shantonu Roy and Debabrata Das, Asian Congress of Biotechnology 2013 (ACB 2013)*, New Delhi, (2013)
29. Holistic Strategies to Capitalize on Energy–Environment–Water Nexus in Biorefinery Model: Bio-inspired R&D Approaches for Global Solutions, *By Ramkrishna Sen, Workshop on Water, Infrastructure and Health under India-Canada Centre for Innovative Multidisciplinary Partnerships to Accelerate Community Transformation and Sustainability (IC-IMPACTS)*, Nagpur, India, (2013)
30. Holistic views of a layman on refining the Green crude for human good, *By Ramkrishna Sen, International Conference on Algal Biorefinery (ICAB - 2013)*, IIT Kharagpur, (2013)
31. Identification and assessment of bioremediation relevant microorganisms indigenous to tank bottom sludge of petroleum oil exploration site, *By Siddhartha Pal, Pinaki Sar and Kazy Sufia Khannam, ICER 13, Aurangabad*, (2013)
32. Improvement of hydrogen production by semicontinuous operation using E. cloacae IIT-BT 08, *By Preeti Mishra, Kanhaiya kumar, Debabrata Das., Asian Congress on Biotechnology (ACB 2013)*, New Delhi, (2013)
33. Klebsiella pneumoniae dacA homologue: A DD-carboxypeptidase or Beta-lactamase?, *By M. Dutta, D. Kar, A. S. Ghosh, Interanational conference on Antimicrobial Agents and Chemotherapy (ICAAC), ASM, Denver, USA*, (2013)
34. Microbial biomineralization : Insights from genome wide analysis, *By Pinaki Sar, Workshop on Modern Biotechnology: Applications of Micro-Nano Technology Systems*, NIT Durgapur, (2013)
35. Microbial diversity and bioremediation: Insights from omics approaches, *By Pinaki Sar, Workshop on Microbial diversity and bioremediation technology*, NIT Rourkela, (2013)
36. Molecular characterization of putative efflux pump MSMEG\_2991 of M. smegmatis, *By Ankita Bansal, Debasish Kar, Dhriti Mallik and Anindya S Ghosh, Society of General Microbiology, Autumn Conference*, University of Sussex, United Kingdom, (2013)
37. Molecular survey on bacterial diversity in arsenic contaminated subsurface sediment in West Bengal, India, *By Dhiraj Paul, Sufia K Kazy, Taraknath Pal and Pinaki Sar, ICER 2013*, Aurangabad, (2013)
38. Non-essential Penicillin-Binding Proteins (PBPs) Maintain an Intrinsic Beta-lactamNon-lactamResistance and Influence Biofilm Formation in Escherichia coli, *By Anindya S*

- Ghosh, Sujoy K. Sarkar, Mouparna Dutta, Akash Kumar, Dhriti Mallik, *FEMS 2013, 5th Congress of European Microbiologists*, Leipzig, Germany, (2013)
39. Novel Transmembrane Protein Kinases as a Prospective Stress Sensor in *Entamoeba*., By Mithu Baidya, Tanya Singh, Santoshi Nayak, Amit K. Das and Sudip K. Ghosh, *82nd Annual Meeting of Society of Biological Chemists*, Hyderabad, India, (2013)
  40. Prospecting cell wall prebiotic from cell suspension culture, By S Dey, Moumita patra, *ACB2013*, Delhi, (2013)
  41. Regenerative medicine using silk protein, By S C Kundu, *World Congress on preventive and regenerative medicine*, Bhubaneswar, (2013)
  42. Silk 3D matrices for tissue regeneration and drug delivery, By S C Kundu, *Challenges in Biomedical Research*, VIT, Vellore, (2013)
  43. Silk as natural biomedical materials for regenerative medicine, By Kundu SC, Dey T, Nayak S., *10th International Symposium on Frontiers in Biomedical Polymers*, British Columbia, Canada, (2013)
  44. Silk materials for tissue regeneration, By S C Kundu, *Workshop on peripheral nerve regeneration*, Wake Forest, USA, (2013)
  45. Simultaneous biodiesel production and bioremediation by *Chlorella* MJ 11/11 grown on thermophilic dark fermentative spent media, By Supratim Ghosh, Shantonu Roy and Debabrata Das, *International Conference on Advances in Biotechnology and Bioinformatics 2013 (ICABB 2013)*, Pune, (2013)
  46. Structural and functional characterization of acetyl CoA acyl transferase (Rv0243), By Kundu P, Dutta D, Das AK, *National Seminar on Crystallography (NSC42)*, Jawaharlal Nehru University (JNU) New De, (2013)
  47. Structural elucidation of Li/Mg inhibition of IMPases, By Dutta A, Bhattacharyya S, Dutta D, Das AK, *National Seminar on Crystallography (NSC42)*, Jawaharlal Nehru University (JNU) New De, (2013)
  48. Study of growth kinetics of *Chlorella sorokiniana* and nutritional values of its biomass., By Kumar, K., Dasgupta, C.N., Das D., *Asian Congress of Biotechnology 2013 (ACB 2013)*, New Delhi, (2013)
  49. Suitability of deoiled cakes (DOCs) as a substrate for biohydrogen production, By Balachandar G, Shantonu Roy, Subhabrata Roy and D Das, *International Conferences on Advances in Biotechnology and Bioinformatics (ICABB)*, Pune, (2013)
  50. Sustainable energy generation through biohydrogen production processes, By Debabrata Das, *2nd International Hydrogen and Fuel Cell Workshop (HAI)*, Goa, (2013)
  51. Taxonomic and physiological characterization of an indigenous *As* transforming bacteria from arsenic contaminated ground water, By Balaram Mohapatra, Angana Sarkar, Sufia K Kazy and Pinaki Sar, *National seminar on utilization of microbes for sustainable development*, Bhubaneswar, (2013)
  52. Thermophilic hydrogen production using in packed bed reactor using molasses as substrate, By Shantonu Roy and Debabrata Das, *The 6th International Conference of Environmental Research (ICER 2013)*, Aurangabad, (2013)
  53. Thermophilic hydrogen production using in packed bed reactor using molasses as substrate, By Shantonu Roy, Balachander G and Debabrata Das, *International Conference on Advances in Biotechnology & Bioinformatics & X Convention of The Biotech Research Society, India (ICABB 2013)*, Pune, (2013)

## Department of Chemical Engineering

### **Head**

Prof. Narayan Chandra Pradhan

### **Professors**

Basu, Jayanta Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Adsorption and Separation Science, Waste Water Treatment, Reaction Engineering
Das, Gargi	<i>Ph.D.(IIT Kharagpur)</i> , Multiphase flow, Two phase instrumentation, CFD simulation
DasGupta, Sunando	<i>Ph.D.(RPI, USA)</i> , Microscale Transport Process and Microfluidics
De, Sirshendu	<i>Ph.D.(IIT Kanpur)</i> , Membrane separations, Transport Processes, Flow through microchannels
Kundu, Gautam	<i>Ph.D.(IIT Kharagpur)</i> , Multiphase Operation, Mineral Beneficiation, Rheology of Suspension, Catalysis
Meikap, Bhim Charan	<i>Ph.D.(IIT Kharagpur)</i> , Industrial Environmental Pollution Monitoring & Control, Coal Beneficiation, CO <sub>2</sub> Capturing, Fluidization
Mukherjee, Dibyendu	<i>Ph.D.(IIT Kharagpur)</i> , Multi Phase Flow, Column Flotation, Modeling & Simulation
Neogi, Sudarsan	<i>Ph.D.(Ohio Univ.,USA)</i> , Surface Modification And Engineering of Polymer Substrates For Biomedical Applications, Plasma Enhanced Chemical Vapor Deposition, Plasma Sterilization, Adhesive Development, Antimicrobial Coatings, Modeling And Simulation Of Chemical Process Plant, Environmental Pollution Control, Polymer Composites
Pradhan, Narayan Chandra	<i>Ph.D.(UDCT Bombay)</i> , Heterogeneous Catalysis, Chemical Process Development, Petrochemical Technology, Petroleum Refining, Separations Technology
Samanta, Amar Nath	<i>Ph.D.(IIT Kharagpur)</i> , Process Dynamics & Control, Nonlinear Process Control, Process Modeling & Simulation, Carbon Capture & Sequestration

### **Associate Professors**

Chakraborty, Sudipto	<i>Ph.D.(IIT Kharagpur)</i> , Process Modelling and Simulation, CFD & Heat Transfer, Ultra-fast cooling of steel, Coal and mineral beneficiation
Kar, Debdulal	<i>Ph.D.(IIT Kharagpur)</i> , Mineral Processing, Fluidization Engineering, Biogas Development
Mukherjee, Rabibrata	<i>Ph.D.(IIT Kanpur)</i> , Polymer Thin Film Instability, Soft Lithography, Structural Super Hydrophobicity, Colloidal Crystals, Soft Nano Fabrication, Self Organized Meso Patterning of Polymers, Sol - Gel Thin Films, Electro Hydrodynamic Instabilities
Neogi, Swati	<i>Ph. D.(Ohio University)</i> , Innovative composite technology, Lifetime and reliability study, Materials development, Composite fabrication technology



Materials utilizing Interfacial Instability 12. Microscale transport processes and microfluidics including droplet based digital microfluidics 13. Training of Personnel for construction and maintenance of Bio Gas Plants. 14. Beneficiation of Coal and Mineral by Column Flotation Cell.

### ***Thrust Areas***

1. Green chemical process technology
2. Advanced separation processes & environmental process engineering
3. Multiphase flow and reaction engineering
4. Petroleum reaction engineering & petrochemical processes
5. Nonlinear process control
6. CFD application in chemical processes and equipment design
7. Technology of composite materials
8. Thin Films, Interfacial and Nano Science
9. Hydrogen Production by steam reforming in microreactor
10. Manufacture and testing of Polymer Composites
11. Plasma treatment
12. Microscale transport processes and microfluidics
13. Column Flotation

### ***New Acquisitions***

1. Cluster Computer
2. High speed parallel computing server
3. High speed camera
4. Stereo zoom microscope
5. Plasma source
6. Gas manifold purification system
7. Autolab
8. Ion Chromatograph

### ***International Collaborations***

Indian investigator: P A Deshpande Austrian collaborator: Dr. Heidrun Gruber-Woelfler Institute: Institute for Process and Particle Technology, Technical University Graz Agency: DST-BMWF India-Austria Scientific-Technological Cooperation (2013-14)

Collaboration with Prof. V.H. Padmanabhan: 1. Sanat Kumar - Columbia University, 2. Jerzy Blawdziewicz - Texas Tech University

C V RAMAN INTERNATIONAL FELLOWSHIP (2012-13) FOR MR. SOREL SAGU TCHEWONPI FROM CAMEROON UNDER VISITING FELLOWSHIP CATEGORY" sponsored by DST and FICCI. A researcher Mr. Sorel Sagu from Cameroon spent 3 months in Membrane Separation lab and worked in extraction of banana juice and had 3 publications (Prof. S. De).

"APPLICATION OF HYBRID MEMBRANE BASED SEPARATION PROCESSES FOR TREATMENT OF INDUSTRIAL WASTE WATER", sponsored by DST and EU involving India, Spain and Germany. This is a tri-national network building project. A workshop is organized at IIT Kharagpur from April 1 and 2. Students from IIT visited Spain and Germany (Prof. S. De).

### ***Lectures by Visiting Experts***

1. Optimization of enzymatic extraction and clarification of banana juice using membrane separation *by* Mr. Sorel Sagu Tchewompi (C V Raman Fellow of African Reserachers, Cameroon)
2. Smart Polymer Hydrogels: Thermodynamics & Rheology *by* Dr. Ashis Lele (Senior Principal Scientist, National Chemical Laboratory)
3. Science and Engineering of Pores, Particles and Interfaces in Development of Green Chemical and Biological Processes *by* Prof. Ganapati D Yadav (Vice-Chancellor and R T Mody Distinguished Professor, J C Bose National Fellow, INSTITUTE OF CHEMICAL TECHNOLOGY (ICT), MUMBAI)
4. Rheology of Viscoelastic Materials - Principles and Applications *by* Dr Sumanta Raha (Anton Paar India)
5. Into the Mind of a Young Entrepreneur *by* Dr. Sunil Dhole (founder of M/s, Technorbital)
6. Water Purification Using Humidification Dehumidification Systems *by* Prof. Sarit K Das (DEAN Academic Research, IIT Madras)
7. Characterization of Dissolved Organic Matter in Petroleum Process Affected Waters *by* Dr. Subir Bhattacharjee (Professor of Mechanical Engineering at the University of Alberta)

### ***Doctoral and MS Degrees Awarded***

1. G. Uday Bhaskar Babu : Vapor Recompressed Batch Distillation: Feasibility, Analysis and Control(Ph.D.)
2. Monal Dutta : Development and Application of an Adsorbent for Removal of Water Pollutants(Ph.D.)
3. Uttam Maity : Low Severity Oxidation of Thiophenic S-Compounds Using Nanocrystalline Titanium Silicate Catalysts(Ph.D.)
4. Soumya Sanjeeb Mohapatra : Experimental Studies on Different Cooling Processes to Attain Ultra-fast Cooling rate for Hot Steel Plate(Ph.D.)
5. Soubhik Kumar Bhaumik : Electric Field Actuated Microflows(Ph.D.)
6. Ashwin P Gaikwad : Mixing Effects on Enzymatic and Catalytic Conversion of Cellulose to Fuel Products(Ph.D.)
7. Debarpita Ghosal : Application of Ceramic Foam Supported Catalysts in Alkylation Reactions(Ph.D.)

### ***Member - Professional Bodies***

1. Das, Gargi, *Life member* - Indian Institute of Chemical Engineers
2. Sengupta, Sonali, *Life-member* - Indian Institute of Chemical Engineers
3. Sengupta, Sonali, *Life Member* - Catalysis Society of India
4. Meikap, Bhim Charan, *Life Member* - Indian Institute of Metals
5. Meikap, Bhim Charan, *Member* - American Institute of Chemical Engineers ( AIChE)
6. Meikap, Bhim Charan, *Member* - Canadian Institute of Chemical Engineering
7. Meikap, Bhim Charan, *Life Member* - Indian Institute of Chemical Engineers
8. Meikap, Bhim Charan, *Member* - Institution of Chemical Engineers ( IChemE), UK
9. Meikap, Bhim Charan, *Member* - The South African Institute of Chemical Engineers(SAIChE)
10. Meikap, Bhim Charan, *Life Member* - Indian Institute of Public Health Engineers (IPHE)
11. Meikap, Bhim Charan, *Member* - International Water Association (IWA), UK
12. Chakraborty, Sudipto, *Life Member* - IChE
13. Chakraborty, Sudipto, *Life Member* - IIM
14. Chakraborty, Sudipto, *Life Member* - IE(I)
15. Neogi, Sudarsan, *Member* - Municipal Solid Waste Disposal Committee, WBPCB, Govt. of West Bengal

16. Neogi, Sudarsan, *Member* - Mobile Tower Radiation Committee by Ministry of Environment, Govt. of West Bengal
17. Neogi, Sudarsan, *Member* - Performance Review Committee WBPCB, Govt. of West Bengal
18. Neogi, Sudarsan, *Chairman* - State Level Expert Appraisal Committee, Govt. of India
19. Neogi, Sudarsan, *Member* - Indian Institute of Chemical Engineers
20. Neogi, Sudarsan, *Member* - Administrative Committee WBPCB, Govt. of West Bengal
21. Neogi, Sudarsan, *Member* - Sponge Iron Industries : Status of Environmental Pollution Investigation Committee by Ministry of Environment, Govt. of West Bengal
22. Neogi, Sudarsan, *Member* - West Bengal Pollution Control Board
23. Neogi, Sudarsan, *Technical Advisor* - Ministry of Environment, Govt. of West Bengal
24. Neogi, Sudarsan, *Member* - Refrigerants in Cold Storage review Committee, WBPCB, Govt. of West Bengal
25. Neogi, Sudarsan, *Member of Gov. Body* - Institute of Environmental Studies and Wetland Management, Govt. of West Bengal
26. Chakrabarty, Saikat, *Life Member* - Indian Institute of Chemical Engineers
27. Jana, Amiya Kumar, *Life Member* - Indian Society for Technical Education (ISTE)
28. Jana, Amiya Kumar, *Life Member* - Indian Institute of Chemical Engineers (IICChE)
29. Ganguly, Somenath, *Senior Member* - American Institute of Chemical Engineers
30. Ganguly, Somenath, *Life Member* - Indian Institute of Chemical Engineers
31. Mukherjee, Rabibrata, *Life Member* - Indian Ceramic Society
32. Mukherjee, Rabibrata, *Life Member* - Materials Research Society of India
33. Mukherjee, Rabibrata, *Life Member* - Indian Institute of Chemical Engineers (IICChE)
34. Mukherjee, Rabibrata, *Life Member* - Indian Society of Heat and Mass Transfer (ISHMT)
35. Sarkar, Debasis, *Associate Member* - Indian Institute of Chemical Engineers
36. Sarkar, Debasis, *Associated Member* - The Institution of Engineers (India)
37. Padmanabhan, Venkat, - American Physical Society (APS)
38. Padmanabhan, Venkat, - Indian Institute of Chemical Engineers (IICChE)
39. Padmanabhan, Venkat, - Division of Polymer Physics (DPOLY)
40. Padmanabhan, Venkat, - Division of Biological Physics (DBIO)
41. Atta, Arnab, *Life Member* - Indian Institute of Chemical Engineers (IICChE)
42. Mukherjee, Dibyendu, *Life Member* - Indian Institute of Chemical Engineers
43. Mukherjee, Dibyendu, *Life Member* - Indian Institute of Mineral Engineers
44. Kundu, Gautam, *Life Member* - Indian Institute of Chemical Engineers
45. Kundu, Gautam, *Life Member* - Indian Institute of Mineral Engineers
46. Kundu, Gautam, *Life Member* - Indian Society of Theoretical and Applied Mechanics
47. Basu, Jayanta Kumar, *Life Member* - Indian Institute of Chemical Engineers
48. Pradhan, Narayan Chandra, *Life Member* - Indian Institute of Chemical Engineers
49. De, Sirshendu, *Life Member* - Indian Institute of Chemical Engineering
50. De, Sirshendu, *Life Member* - Indian Society of Theoretical and Applied Mechanics

#### ***Member - Editorial Board***

1. Chakrabarty, Saikat (2009) *Honorary Editorial Board Member* - International Journal of BioSciences and Technology
2. Chakrabarty, Saikat (2009) *Honorary Editorial Board Member* - International Journal of Medical Sciences and Technology
3. Jana, Amiya Kumar (2013) *Member* - ISRN Industrial Engineering
4. Meikap, Bhim Charan (2013) *Editorial Board Member* - WSEAS Transactions on Fluid Mechanics
5. Meikap, Bhim Charan (2012) *Editor* - South African Journal of Chemical Engineering
6. Padmanabhan, Venkat (2014) *Member* - Journal of Polymer & Composites
7. Padmanabhan, Venkat (2014) *Member* - Journal of Advance Research in Polymer & Textile Engineering

### ***Awards & Honours***

1. De, Sirshendu (2013) *CSMCRI Distinguished Speaker Award in CHEMCON 2013 from Indian Institution of Chemical Engineers*
2. De, Sirshendu (2012) *DAE-SRC Outstanding Investigator Award from Department of Atomic Energy, Govt. of India*
3. Mukherjee, Rabibrata (2014) *MRSI Medal, 2014*
4. Deshpande, Parag Arvind (2014) *N. R. Kuloor memorial medal*
5. De, Sirshendu (2013) *NASI-Reliance Industries Platinum Jubilee award from National Academy of Science, Allahabad*
6. De, Sirshendu (2012) *Silver Jubilee Young Engineer Award from Indian National Academy of Engineering, New Delhi*
7. Jana, Amiya Kumar (2013) *Visiting Professor: University of Alberta, Edmonton, Canada (May–December)*

### ***Sponsored Research Projects***

1. A novel approach to a selective catalytic process for reducing thiophenic sulphur content from petroleum products (Council of scientific and industrial research, Rs.7.00 Lakhs)
2. A study of Microscale transport processes leading to the development of a cooling strategy for electronic components (Department of Information Technology, Rs.89.76 Lakhs)
3. Advanced Material Processing using Radiofrequency Plasma for Biomedical Applications (DST, Govt of India, Rs.0.00 Lakhs)
4. Ammonia Production By Using Urea For Flue Gas Conditioning ( FGC) (National Thermal Power Corporation ( NTPC), New Delhi, Rs.0.00 Lakhs)
5. ANALYSIS OF DOPED OXIDE CATALYSTS FOR PHARMACEUTICAL REACTIONS (DST, Rs.24.00 Lakhs)
6. Antimicrobial Coating on Plasma Treated substrates for biomedical application (Life Science Research Board, DRDO, Rs.20.00 Lakhs)
7. APPLICATION OF HYBRID MEMBRANE BASED SEPARATION PROCESSES FOR TREATMENT OF INDUSTRIAL WASTE WATER (DST, Rs.22.00 Lakhs)
8. Bio Gas Development & Training center (Ministry of New & Renewable Energy, Rs.10.00 Lakhs)
9. C V RAMAN INTERNATIONAL FELLOWSHIP (2012-13) FOR MR. SOREL SAGU TCHEWONPI FROM CAMEROON UNDER VISITING FELLOWSHIP CATEGORY (FICCI, Rs.3.50 Lakhs)
10. CENTRE OF EXCELLENCE FOR TRAINING AND RESEARCH IN MICROFLUIDICS (Golden Jubilee Grant, IIT Kharagpur, Rs.251.90 Lakhs)
11. Centre of excellence for training and research in Microfluidics (IIT Kharagpur, Rs.251.90 Lakhs)
12. Design, analysis and control of internally heat integrated distillation columns (DST, New Delhi, Rs.0.00 Lakhs)
13. Design, Modeling and Control of a High Pressure Pilot Scale HIX Reactive Distillation (DAE, BARC, Mumbai, Rs.0.00 Lakhs)
14. Development and characterization of a high efficiency wet scrubber with internals for air pollution control (IIT Kharagpur, Rs.0.00 Lakhs)
15. Development of experimental setup and study on upgradation of high ash Indian coal (DES) (Tata Steel, Jamshedpur, Rs.20.00 Lakhs)
16. DEVELOPMENT OF FRP - NANO COMPOSITE FOR MARINE STRUCTURAL APPLICATION (DRDO, Rs.42.96 Lakhs)
17. Development of low cost hemodialyzer cartridge (DST, Rs.35.00 Lakhs)
18. Development of Nano FRP Composites for Marine Applications sponsored by Naval Research Board (DRDO, Govt. of India, Rs.0.00 Lakhs)
19. Droplet based screening of Amyloid  $\beta$ -peptide aggregation (DBT, Rs.43.44 Lakhs)



20. Estimation of Life time & Life Cycle cost of FRP Pipes manufactured using various technologies for Offshore and Onshore Application. (ONGC, Rs.30.00 Lakhs)
21. Evaporative drying assisted meso patterning under lateral confinement. (Jan 2014 - Dec 2016) (Science and Engineering Research Board (SERB), DST, Rs.48.75 Lakhs)
22. Experimental Investigations and theoretical Analysis of Internal Hydraulic Jump in closed conduits (DST, Rs.45.00 Lakhs)
23. EXPERIMENTAL AND THEORETICAL INVESTIGATIONS OF POLYMERIZATION-GRADE ETHYLENE SYNTHESIS (DST, Rs.55.00 Lakhs)
24. Fabrication and Durability Studies of Structured Superhydrophobic Surfaces (GRO Program, Samsung, Korea, Rs.63.30 Lakhs)
25. Fabrication of Nanostructured Surfaces by Soft Lithographic & Non Lithographic Techniques (Solar Energy Research Initiative (SERI), DST, Govt. of India, Rs.80.39 Lakhs)
26. FIELD TRIAL OF LOW COST LATERITE BASED ARSENIC FILTER: DOMESTIC AND COMMUNITY SCALE (DST, Rs.20.00 Lakhs)
27. Foam-gel formation in thin layer with flow complexities affecting the placement (DST, Rs.35.00 Lakhs)
28. Heat Transfer, Simulation and Measurement of Thermal properties of Sheet Molding Compound (CSP plastics, Troy, Michigan USA, Rs.0.00 Lakhs)
29. Hydrodynamic interactions and force measurements of the nematode *Caenorhabditis elegans* (ISIRD, SRIC, IIT Kharagpur, Rs.500000.00 Lakhs)
30. Hydrodynamic Study of Vortex and Air-Core Formation in a Two Phase Flow for Simple Geometries ( FSG) (Tata Steel Limited, Jamshedpur, Rs.0.00 Lakhs)
31. Hydrodynamics Studies on Micro Bubble Generators ( MBG) (M/s Tata Steel, Jamshedpur, Rs.0.00 Lakhs)
32. IN SILICO MECHANISTIC INVESTIGATIONS OF DE NOVO SYNTHESIS OF MYCOBACTERIUM TUBERCULOSIS DNA (ISIRD SRIC IIT Kharagpur, Rs.5.00 Lakhs)
33. IN SILICO STRUCTURAL AND FUNCTIONAL INVESTIGATIONS OF ISOZYMES OF CARBONIC ANHYDRASE FAMILY (DBT, Rs.36.00 Lakhs)
34. Instability and Pattern Formation in Thin Polymer Bilayers (DST Nano Mission, Rs.52.20 Lakhs)
35. INVESTIGATION OF SUZUKI- MIYAUURA REACTION CATALYZED BY IONIC PD IMMOBILIZED IN INORGANIC OXIDE MATRIX (DST India-Austria Collaborative Research Programme, Rs.14.00 Lakhs)
36. LAB-ON-A-CHIP DEVICE FOR POINT-OF-CARE DIOGNOSIS (, Rs.9.00 Lakhs)
37. LIFETIME STUDY ON NANO-FRP FOR UNDERWATER APPLICATION (NMRL, Rs.19.90 Lakhs)
38. Locomotion and chemotaxis of the nematode *Caenorhabditis elegans* in complex media (DST, New Delhi, Rs.2715600.00 Lakhs)
39. MATERIAL CHARACTERIZATION, MODELLING & SIMULATION FOR PREPREG BASED COMPOSITE FABRICATION PROCESSES (ASL, Hyderabad, Rs.29.60 Lakhs)
40. Modeling, Analysis and Control of Reactive Distillation Columns (CSIR, New Delhi, Rs.0.00 Lakhs)
41. MODELLING FISH LOCOMOTION IN TURBULENT VORTICES (CSIR, Rs.18.00 Lakhs)
42. MODELLING OF THE ELECTROTHERMAL PROCESS OF MAGNESIUM PRODUCTION AND PROCESS OPTIMIZATION (NML, Rs.13.00 Lakhs)
43. National Renewable Fellowships (MNRE, Rs.61.76 Lakhs)
44. Optimization of batch crystallization processes under uncertainty (ISIRD Grant of SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
45. Performance Characterization of a Hydrocyclone with Internals for Separation of Fine Particles( CHF) (CSIR, New Delhi, Rs.19.28 Lakhs)
46. Performance Evaluation of Bag Filters in the Sponge Iron Plants in Orissa-Field Investigation ( BFS) (State Pollution Control Board, Orissa ( Ministry of Environment & Forest, Govt. of Orissa), Rs.0.00 Lakhs)

47. Performance Evaluation of Bag Filters in the Sponge Iron Plants in Orissa-Field Investigation ( BFS) Phse-II ( PEO) (State Pollution Control Board, Orissa ( Ministry of Environment & Forest, Govt. of Orissa), Rs.0.00 Lakhs)
48. Performance Study of a Hydrocyclone ( HDR) (M/s Tata Steel, Jamshedpur, Rs.0.00 Lakhs)
49. PK Sinha Center Project (IIT Foundation, Rs.1000.00 Lakhs)
50. Plasma Treatment of SMC on Surface Energy and Orange Peel Index of Painted Substrates (CSP Plastics, Troy, Michigan, USA, Rs.0.00 Lakhs)
51. Portable Electricity Generator from Organic Waste (IIT Kharagpur, Rs.1.98 Lakhs)
52. PREPARATION, CHARACTERIZATION AND PERFORMANCE OF FUNCTIONALIZED MEMBRANE WITH IMPROVED ANTI-FOULING PROPERTIES (BRNS, Rs.100.00 Lakhs)
53. PROCESSING OF TENDER COCONUT WATER USING MEMBRANE FILTRATION (Technoeagles Pvt. Ltd., Rs.10.00 Lakhs)
54. Production of monodispersed nanoparticles for a large class of materials using heat treatment based post processing technique (ISIRD SRIC IIT Kharagpur, Rs.5.00 Lakhs)
55. Production of Synthesis Gas and Its Clean Processing by a Multi-Stage Wet Scrubber(PSG) (Department of Science & Technology ( DST), Govt. of India, Rs.10.35 Lakhs)
56. Rapid DNA hybridization in microfluidic channels (DBT, Rs.42.00 Lakhs)
57. Renewable Resource/Bio based Low Density SMC Development (CSP Plastics, Troy, Michigan, USA (Co-investigator), Rs.0.00 Lakhs)
58. Rheology of complex fluids in confined flows (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
59. Steel Technology Centre (TCB) (Ministry of Steel & DST, New Delhi, Rs.2025.00 Lakhs)
60. Studies on Effective Use of Microwave Energy for Green Mineral Beneficiation and Pipe Line Slurry Transport ( MEG) (Council of Scientific and Industrial Research(CSIR), New Delhi, Rs.0.00 Lakhs)
61. Theoretical and experimental analysis of evaporation in the grooves of a micro heat pipe (ISRO, Rs.19.44 Lakhs)
62. Thermomechanically processed high strength bainitic steel rails for Indian Railways (TBR) (RDSO, Indian Railways, Rs.0.00 Lakhs)
63. Tuneable Meso Patterning of Polymer Bilayer Thin Films with Electric Field (ISIRD Grant of SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
64. Upgradation of facilities under Renewable Energy Program (MNRE, Rs.50.00 Lakhs)
65. Virtual Lab on Chemical Process Dynamics (MHRD, New Delhi, Rs.0.00 Lakhs)

### ***Consultancy Projects***

1. Antimicrobial Coatings On Plasma Modified Polymer Substrates (DRDO, Govt. of India, Rs.0.00 Lakhs)
2. Audit of the Coal Tar Distillation EIA Report (AVH Chemicals, Rs.1.80 Lakhs)
3. Blast Protection System For Vehicle Glass Windows (Army Technical Board, Govt. of India, Rs.0.00 Lakhs)
4. Composite Development Center (RDSO, Rs.7.50 Lakhs)
5. Consultancy Input on Design and Hydrodynamics Studies of Micro Bubble Generator (M/s Tata Steel, Jamshedpur, Rs.0.00 Lakhs)
6. Consultancy services for implementation of APC in DCU and HCU (NRL Ltd, Rs.7.72 Lakhs)
7. Design and development of a mathematical model for ultra fast cooling of steel strips (DDMM) (Tata Steel, Jamshedpur, Rs.0.00 Lakhs)
8. Design of an Industrial Scale Hydrocyclone ( DISH) (M/s Tata Steel, Jamshedpur, Rs.0.00 Lakhs)
9. Design of Bubble Column with External Bubble Generator ( BCEB) ( M/s Tata Steel, Jamshedpur, Rs.0.00 Lakhs)

10. Design verification and critical analysis of bag filters installed at sponge iron plant in Orissa (CABF) (Orissa State PCB, Rs.0.00 Lakhs)
11. Design Verification of Bag Filters installed at various Sponge Iron Plants in Orissa (State Pollution Control Board, Orissa, Bhubaneswar, Rs.0.00 Lakhs)
12. Development of gas sweetening technology for removal of co2 from natural gas (Engineers India Limited, Rs.30.00 Lakhs)
13. DEVELOPMENT OF LIGHT WEIGHT COMPOSITE CYLINDERS FOR STORAGE OF COMPRESSED NATURAL GAS (CNG) (Gail, Rs.221.05 Lakhs)
14. Development of Long Fiber Thermoplastic Composites (IIT Kharagpur, Rs.3.00 Lakhs)
15. Development of mixing model for alloy dissolution in steel ladles (MMAD) (Tata Steel, Jamshedpur, Rs.0.00 Lakhs)
16. Development of Natural fiber SMC (Continental Structural Plastics, Troy, MI, Rs.32.00 Lakhs)
17. Development Of Software For Design Of Two Phase Flow System With Simple Geometries (DSSG) (M/s Tata Steel, Jamshedpur, Rs.0.00 Lakhs)
18. Examination of STPP Manufacture at Haldia (M/s Tata Chemicals, Durgachak, Haldia, Rs.0.00 Lakhs)
19. FIELD DEMONSTRATION OF LOW COST LATERITE BASED ARSENIC FILTER-COMMUNITY SCALE (UNICEF, Kolkata, Rs.13.00 Lakhs)
20. Modeling for Upscaling the Capacity of Ceramic Membrane based Wastewater Treatment Unit (Central Glass & Ceramic Reserach Institute, Rs.5.91 Lakhs)
21. Modelling of a closed cycle boiler reactor (CCBR) (NSTL (DRDO) Vizag, Rs.9.92 Lakhs)
22. Modelling of Chocolate behavior during tempering and cooling process (CBTP) (Cadbury India Ltd, Thane, Rs.4.00 Lakhs)
23. Modelling of thermite based closed cycle thermal system (CCTS) (HEMRL (DRDO), Pune, Rs.9.00 Lakhs)
24. MONITORING IN CRITICALLY POLLUTED AREA (CPA) KORBA OF CHHATTISGARH FOR ASSESSMENT OF COMPREHENSIVE ENVIRONMENTAL POLLUTION INDEX (CEPI) (CECB, Raipur, CG, Rs.30.35 Lakhs)
25. Optimization, characterization and casting of haemodialysis membranes (Acropetal Pvt. Ltd, Rs.21.00 Lakhs)
26. Pelletization of Zeolite Synthesized from Lignite Fly Ash and Application of Zeolite Pellets in Treatment of Ground Water and Blowdown Water (Neyveli Lignite Corporation Ltd., Rs.28.67 Lakhs)
27. PERFORMANCE EVALUATION OF BAG FILTER SYSTEM(EABS) (M/S-AARTI STEEL LTD., Rs.0.00 Lakhs)
28. Process Simulation and Material Balance of Uran Plant (Oil and Natural Gas Commission, Rs.6.47 Lakhs)
29. Renewable resource/bio-based low density SMC development (Continental Structural Plastics, 755 West Big Beaver Road, Suite 700, Troy, MI 48084, USA, Rs.30.00 Lakhs)
30. Study and Modeling of Gas Processing Plant at Uran (ONGC, Rs.6.70 Lakhs)
31. Surface energy Modification of SMC substrates using RF Plasma (CSP Plastics, TROY, MICHIGAN, USA, Rs.6.00 Lakhs)
32. Survey of Biogas Plants in West-Bengal (West-Bengal Renewable Energy Agency, Rs.2.50 Lakhs)
33. Technical Support and guidance to Improve Quality of Lead Acid Battery (QLAB) (M/S Bright Solar Ltd., Rs.0.00 Lakhs)
34. Testing & prototype manufacturing of composite products. (Various Organizations, Rs.5.00 Lakhs)
35. Training Programme on Pultrusion Technology with Introduction to other Fabrication Method. (Zoom Developers, Rs.0.60 Lakhs)
36. Verification of Bag Filter System at M/S Maithan Ispat Ltd. (M/S Maithan Ispat Ltd., Orissa, Rs.1.48 Lakhs)

### ***Patents (filed / granted)***

1. A Cheap and simple attachment to orient any object to desired direction accurately under microscope for efficient viewing and imaging.
2. A co-flow device to make a gel matrix with embedded voids of sub-millimeter tunable dimensions
3. A method for generation of meso scale surface patterns with different feature height in polymer films Coated on Planar and non planar Surfaces using a single stamp
4. A Novel Set up for Spinning Polymeric Hollow Fiber Membrane
5. A process for enzymatic hydrolysis of cellulosic biomass for bioethanol production
6. A process for ionic liquid based catalytic conversion of cellulose to fuel products
7. A simple continuous flow device for process intensification in millimeter size conduits.
8. Creation of Complex micropatterns with flexible stamp
9. Design of a laterite based arsenic filter for domestic and community scale
10. Development of high capacity and cost effective arsenic adsorbent using modified laterite
11. Development of Vehicle Structure to Withstand Blast Loading
12. Electric field assisted membrane separation of pectin
13. Generation of Submicron to Macroscopic Patterns and Objects by Successive Miniaturization Using Shrinkable Materials and Articles Formed Thereby
14. Harikrishnan G, Macosko CW, Lindsay CI, Singh, SN. Clay – Isocyanate nano dispersions and polyurethane nanocomposite produced there with.
15. Harikrishnan. G, Patro T. U, Khakhar D. V. Clays as cell openers in polyurethane foams
16. Harikrishnan. G, Patro T. U, Khakhar D. V. Reticulated vitreous carbon with controlled pore size and enhanced electrical conductivity from open cell polyurethane foam precursors containing montmorillonite based clays
17. Implantable Device having Antimicrobial coating and a method of Manufacturing the same
18. Membrane based water-extraction of polyphenols from green tea leaves
19. Micro and sub micro patterning of soft solids and articles formed thereby
20. Process for recovery of inorganic chemicals from kraft black liquor
21. Production of organic fertilizer from tannery effluent
22. Separator-collector for thin oil layers floating on water
23. Vaginal Microencapsulated Effervescent Contraceptive and its delivery system
24. Vehicle capable of dissipating explosion force and energy

### **Visits Abroad by Faculty Members**

1. Jana, Amiya Kumar - Visiting Professor (University of Alberta, Edmonton, Canada, ) May–December, 2013
2. Chakrabarty, Saikat - Research Collaboration (University of California Berkeley, USA, ) October 19-26, 2013
3. DasGupta, Sunando - Representing Institute in the Global Alumni Meet 2013 (USA, ) Dec. 2013
4. Deshpande, Parag Arvind - Collaboration (TU Graz, ) 08/12/2013-22/12/2013
5. Mukherjee, Rabibrata - Invited talk at International Conference on Soft Matters (Rome, Italy, ) September 19 - 24, 2013

### **Invited Lectures by Faculty Members**

1. Eco-Friendly Processes for the Production of Valuable Chemicals from Hydrotreater Off Gas *by* Pradhan, Narayan Chandra (SCHEMCON-2013, MVGR College of Engineering, Vizianagaram, AP)
2. Physics of polymer nanocomposites: a thermodynamics point of view *by* Padmanabhan, Venkat (Indian Institute of Science)

3. Modeling approaches of pressure driven membrane processes *by* De, Sirshendu (IIT Kharagpur)
4. How to functionalize membranes? *by* De, Sirshendu (ICT Mumbai)
5. Hierarchical modeling of pressure driven membrane processes *by* De, Sirshendu (BESU, Shibpur)
6. Functional polymeric membranes and their applications *by* De, Sirshendu (Goa)
7. Polymeric Membranes: Tailor-made casting and their applications *by* De, Sirshendu (TISCO, Jamshedpur)
8. Polymeric membranes and their applications *by* De, Sirshendu (Materials Science Center, IIT Kharagpur)
9. Low cost laterite based arsenic mitigation *by* De, Sirshendu (INSA, IIT Kharagpur)
10. Casting of membranes and its applications *by* De, Sirshendu (KIIT, Bhubaneswar)
11. Laterite based arsenic filters and their performance *by* De, Sirshendu (KIIT, Bhubaneswar)
12. Low cost laterite based arsenic filter at community scale *by* De, Sirshendu (Kolkata)
13. Fugitive Dust Emission Control in Sponge Iron Plants *by* Meikap, Bhim Charan (IIT Roorkee)

### ***Books Published***

1. Amiya K Jana: 2. Chemical Process Modelling and Computer Simulation *published by* Prentice-Hall, 2nd Edn. (2011)
2. Amiya K Jana: 1. Process Simulation And Control Using Aspen *published by* Prentice-Hall, 2nd Edn. (2012)
3. N. Gomthi, D. Mishra, T. K. Maiti and S. Neogi: Surface and Interfacial Aspects of Cell Adhesion (Chapter-Helium Plasma Treatment to Improve Biocompatibility and Blood Compatibility of Polycarbonate *published by* VSP, LEIDEN, BOSTON (2010)
4. S. De: Novel Separation Processes *published by* WEB book by NPTEL (2010)
5. S. De and A. Maiti: Arsenic removal from contaminated groundwater using laterite based adsorption technique *published by* TERI Press (2011)
6. S. De and S. Mondal: Micellar enhanced Ultrafiltration: A surfactant mediated membrane based process *published by* CRC Press (2011)
7. S. De, B. Sarkar, S. DasGupta: Electric filed enhanced membrane separation system: Principles and Typical applications *published by* Nova Science Publishers. Inc (2010)
8. S. De, C. Das, S. DasGupta: Treatment of Tannery effluent by membrane separation technology *published by* Nova Science Publishers. Inc (2010)
9. S. De, S. Banerjee and S. Mondal: Stevioside: Technology, Applications and Health *published by* Wiley-Blackwell (2013)
10. S. De, S. DasGupta and S. Ranjith: Membrane based clarification/concentration of Fruit Juice *published by* Nova Science Publishers. Inc (2009)
11. Sumana Ghosh, Gargi Das and P.K.Das: Hydrodynamics of core annular flow through Pipes and Pipe fittings *published by* Lap Lambert (2013)
12. Tanumoy Mukherji, Gargi Das, Subhabrata Ray: Hydrodynamics of gas-liquid-liquid upflow - Experimental Studies in Vertical Pipe *published by* LAP Lambert (2013)

### ***Papers Published in Journals***

1. Distribution of respirable suspended particulate matter in ambient air and its impact on human health and remedial measures at Bholabedha-Joda-Barbil region in Orissa *By* K. Panda, A. K. Swar, B. C. Meikap *South African Journal of Chemical Engineering* 18, 18-29 (2013)
2. Low-Voltage Electrohydrodynamic Micropumping of Emulsions *By* S. Bhaumik, R. Roy, S. Chakraborty and S. DasGupta *Sensors & Actuators: B* 193, 288–293, (2014)
3. 46. A Hybrid Heat Integration Scheme for Bioethanol Separation through Pressure-Swing Distillation Route *By* Kiran, B. and Jana, A. K. *Under Review* (2014)

4. 47. Assessing the performance improvement of an intensified heat integration scheme: Reactive pressure-swing distillation *By* Kiran, B. and Jana, A. K. *Applied Thermal Engineering* Revision Submitted (2014)
5. 48. A New Energy-Efficient Batch Stripper: Thermodynamic Feasibility, Cost Analysis and CO<sub>2</sub> Emissions *By* Jana, A. K. *Under Review* (2014)
6. 49. Introducing Vapor Recompression Mechanism in Heat Integrated Distillation Column (HIDiC): Impact of Internal Energy Driven Intermediate and Bottom Reboiler *By* Kiran, B. and Jana, A. K. *AIChE Journal* Revision Submitted (2014)
7. 50. Synthesis of Extended Generic Model Control Law and Theoretical Equivalence with Globally Linearized Controller *By* Jana, A. K. *Under Review* (2014)
8. 51. High Gain Observer based Extended Generic Model Control with Application to a Reactive Distillation Column *By* Banerjee, S. and Jana, A. K. *Journal of Process Control* 24, 235-248 (2014)
9. 52. A New Internally Heat Integrated Dividing Tower Batch Distillation: Feasibility and Analysis *By* Gyanprakash, M. and Jana, A. K. *Under Review* (2014)
10. 53. A Simple Thermo-Physical Model for Vapor-Liquid Equilibrium of the Reactive H<sub>1x</sub> (HI-H<sub>2</sub>O-I<sub>2</sub>-H<sub>2</sub>) System *By* Mandal, S. and Jana, A. K. *Journal of Industrial & Engineering Chemistry*, DOI: 10.1016/j.jiec.2013.10.050 (2014)
11. 54. Impact of Vapor Recompression in Batch Distillation on Energy Consumption, Cost and CO<sub>2</sub> Emission: Open-loop versus Closed-loop Operation *By* Babu, G. U. B. and Jana, A. K. *Applied Thermal Engineering* 62, 365-374 (2014)
12. 55. Advances in heat pump assisted distillation column: A review *By* Jana, A. K. *Energy Conversion and Management* 77, 287-297 (2014)
13. A neural network prediction of conversion of benzothiophene oxidation catalyzed by nano-Ti-beta catalyst *By* Uttam Maity, Jayanta Kumar Basu, Sonali Sengupta *Fuel* Vol. 113, pp 180-186 (2013)
14. A Novel Mixing Strategy for Maximizing Yields of Glucose and Reducing Sugar in Enzymatic Hydrolysis of Cellulose *By* Ramendra Pal and Saikat Chakraborty *Bioresource Technology* 148C, pp 611-614 (2013)
15. Achievement of ultrafast cooling rate in a hot steel plate by air-atomized spray with different surfactant additives *By* Satya V Ravikumar, Jay M Jha, Ishita Sarkar, Soumya S Mohapatra, Surjya K Pal and Sudipto Chakraborty *Experimental Thermal and Fluid Science, Elsevier*, 50, pp 79-89 (2013)
16. Adsorptive removal of fluoride by activated alumina doped cellulose acetate phthalate (CAP) mixed matrix membrane *By* S. Chatterjee and S. De *Separation & Purification Technology* 125,223-238 (2014)
17. Adsorptive removal of phenolic compounds using cellulose acetate phthalate -alumina nanoparticle mixed matrix membrane *By* R. Mukherjee and S. De *Journal of Hazardous Materials* 256, 8-19 (2014)
18. Application of artificial neural network for prediction of Pb(II) adsorption characteristics *By* Monal Dutta and Jayanta Kumar Basu *Environ Sci Pollut Res* 20,3322-3330 (2013)
19. Aqueous degradation kinetics of pharmaceutical drug diclofenac by photocatalysis using nanostructured titania-zirconia composite catalyst *By* L. Das, S. K. Barodia, S. Sengupta, J. K. Basu *International Journal of Environmental Science and Technology* online (2014)
20. Comparison of treated laterite as arsenic adsorbent from different locations and performance of best filter under field conditions *By* A. Maiti, B. K. Thakur, J. K. Basu and S. De *Journal of Hazardous Materials* 262, 1176-1186 (2013)
21. Confinement enhances dispersion in nanoparticle-polymer blend films *By* Sivasurender Chandran, Nafisa Begam, Venkat Padmanabhan, Jaydeep Basu *Nature Communications* (2104)
22. Control of Morphology in Pattern Directed Dewetting of a Thin Polymer Bilayer *By* Sudeshna Roy, Debarati Biswas, Namrata Salunke, Ajit Das, Pavanaphani Vutukuri, Ravdeep Singh and Rabibrata Mukherjee *Macromolecules* 46, 935 -948 (2013)

23. Curing Kinetics of Medium Reactive Unsaturated Polyester Resin Used for Liquid Composite Molding Process By Raghu Raja Pandiyan K., Saikat Chakraborty, Gautam Kundu and Swati Neogi *Journal of Applied Polymer Science* Vol. 114, 2415–242 (2009)
24. Cyclic operation of trickle bed reactors: A review By A. Atta, S. Roy, F. Larachi, K.D.P. Nigam *Chemical Engineering Science* Accepted (2013)
25. Decontamination of tannery industry wastewater containing high organic load along with Cr<sup>3+</sup>: a comparative study By Prabir Ghosh, R Kumar, AN Samanta, S Ray *Asia Pacific Journal of Chemical Engineering* 8, 5, 645-656 (2013)
26. Determination of Metastable Zone Width by a Simple Optical Probe By Koduru Krishna Chaitanya and Debasis Sarkar *Chemical Engineering and Technology* Accepted (2014)
27. Development of Manufacturing Technology for Cab Front using Resin Transfer Moulding Process By Raghu Raja Pandiyan K., Jiten Patel, Gautam Kundu and Swati Neogi *Journal of Composite Materials* 44(18), 2217-2231 (2010)
28. Droplet Transport Through Dielectrophoretic Actuation using Line Electrode By S. Bhaumik, S. Das, S. Chakraborty and S. DasGupta *Microfluidics and Nanofluidics* 16 (3), 597 – 603 (2014)
29. Drying characteristics and evolution of the pore space in alginate scaffold with embedded sub-millimeter voids. By Bal, D.K., Patra, S., Ganguly, S *Journal of Sol Gel Science and Technology* 68(2) 254-260 (2013)
30. Dynamic Flux Balance Analysis of Batch Fermentation: Effect of Genetic Manipulations on Ethanol Production By K. P. Lisha and Debasis Sarkar *Bioprocess and Biosystems Engineering* 37:617-627 (2014)
31. Effect of heat diffusion in the burden on the dissociation of methane in a hydrate bearing formation. By Vinaykumar B.G., Singh A.P., Ganguly S *Journal of Natural Gas Science and Engineering* 16, 70-76 (2014)
32. Effect of Ionic Surfactants and Alcohols on Morphology of CuSO<sub>4</sub>.5H<sub>2</sub>O Crystals: Combined Use of Factors and Significance of Threshold Surfactant Concentration By Singh, Nitish Yeri, Ribani Chakraborty, Jayanta *Industrial and Engineering Chemistry Research* 52(43) 15041-15048 (2013)
33. Effect of pressure pulsing on concentration boundary layer over membrane - a numerical investigation. By Lalrinsanga, R.K., Bejgam, N.B., Ganguly, S. *Asia Pacific Journal of Chemical Engineering* 8(4) 519-526 (2013)
34. Effects of non-Newtonian power law rheology on mass transport of a neutral solute for electro-osmotic flow in a porous microtube By S. Mondal and S. De *Biomicrofluidics* 7, 044113 (2013)
35. Enhanced Microcooling by Electrically Induced Droplet Oscillation, By M. Chakraborty, A. Ghosh, S. DasGupta *RSC Advances* 4 (3), 1074 – 1082 (2014)
36. Enhancement of cooling rate for a hot steel plate using air-atomized spray with surfactant-added water By Soumya S Mohapatra, Jay M Jha, K Srinath, Surjya K Pal and Sudipto Chakraborty, *Experimental Heat Transfer, Taylor & Francis* 27(1), pp 72 – 90 (2013)
37. Enhancement of heat transfer rate in air-atomized spray cooling of a hot steel plate by using an aqueous solution of non-ionic surfactant and ethanol By Satya V. Ravikumar, Jay M. Jha, Ishita Sarkar, Surjya K. Pal, Sudipto Chakraborty *Applied Thermal Engineering, Elsevier* Vol 64, pp 64–75 (2014)
38. Enhancement of solute release from alginate scaffold with embedded sub-millimeter voids. By Bal, D.K., Ganguly, S *Journal of Biomaterials Science, Polymer Edition* 25(1) 51-60 (2014)
39. Experimental investigation of air-atomized spray with aqueous polymer additive for high heat flux applications By Satya V. Ravikumar, Jay M. Jha, A.M. Tiara, Surjya K. Pal, Sudipto Chakraborty *International Journal of Heat and Mass Transfer, Elsevier* 72, pp 362–377 (2014)
40. Experimental study of the effect of spray inclination on ultrafast cooling of a hot steel plate By Satya V Ravikumar, Jay M Jha, Soumya S Mohapatra, Apurva Sinha, Surjya K Pal and Sudipto Chakraborty *Heat and Mass Transfer, Springer* 49, pp 1509 – 1522 (2013)

41. Extraction of Steviol Glycosides Using Novel Cellulose Acetate Phthalate (CAP) - Polyacrylonitrile Blend Membranes By A. Roy and S. De *Journal of Food Engineering* 126, 7-16 (2014)
42. Fixed-bed column study for the adsorptive removal of acid fuchsin using carbon-alumina composite pellet By Monal Dutta and Jayanta Kumar Basu *Int. J. Environ. Sci. Technol* 11(1),87-96 (2013)
43. Foam stability and polymer phase morphology of flexible polyurethane foams synthesized from castor oil By Sharma C, Kumar S, Unni AR, Aswal VK, Rath SK, Harikrishnan G *Journal of Applied Polymer Science* (in press) (2014)
44. Influence of Curing Agents on Gelation and Exotherm Behaviour of Unsaturated Polyester Resin By Raghu Raja Pandiyan K. and Swati Neogi *Bulletin of Material Science* (2013)
45. Influence of ultrafast cooling on microstructure and mechanical properties of steel By Satya V Ravikumar, Jay M Jha, Soumya S Mohapatra, Surjya K Pal and Sudipto Chakraborty *Steel Research International, Wiley* 84, pp 1157–1170 (2013)
46. Lithographic Tuning of Polymeric Thin Film Surfaces by Stress Relaxation By Nandini Bhandaru, Sudeshna Roy, Suruchi, G. Harikrishnan, and Rabibrata Mukherjee\* *ACS Macro Letters* 2, 195 - 200 (2013)
47. Mass Transfer of a neutral solute in Porous Microchannel under Streaming Potential By S. Mondal and S. De *Electrophoresis* 35, 681-690 (2014)
48. Measurement of Effective Permeability of Reinforcement Mats using Sensitivity Analysis By 7. Raghu Raja Pandiyan K., Vijay Shinde and Swati Neogi *Polymer Composites* 33(18), 1445-1454 (2012)
49. Mixing and temperature effects on the kinetics of alkali metal catalyzed, ionic liquid based batch conversion of cellulose to fuel products By Ashwin Gaikwad and Saikat Chakraborty *Chemical Engineering Journal* 240, pp 109-115 (2014)
50. Modeling of gel layer controlled fruit juice microfiltration in a radial cross flow cell By S. Mondal, A. Cassano and S. De *Food and Bioprocess Technology* 7, 355-370 (2014)
51. Modelling of Curing Kinetics of Amine Cured Epoxy Resins for Vacuum Assisted Resin Infusion Molding By Sudip Bhunia, Debdarsan Niyogi, Pramod Marru and Swati Neogi *Can. J. Chem. Eng.* Vol. 9999, 1–9 (2013)
52. Multi-walled CNT-induced phase behaviour of poly(vinylidene fluoride) and its electro-mechanical properties By Rath SK, Dubey S, Kumar GS, Kumar S, Patra AK, Bahadur J, Singh AK, Harikrishnan G, Patro TU *Journal of Materials Science* 49:103–113 (2014)
53. Multiscale analysis of simultaneous uptake of two reactive gases in the human lungs and its application to methemoglobin anemia By Tanmoy Sanyal and Saikat Chakraborty *Computers and Chemical Engineering* 59, pp 226–242 (2013)
54. Optimization of low temperature extraction of banana juice using commercial pectinase By S. T. Sagu, E. J., Nso, S. Karmakar and S. De *Food Chemistry* 151, 182-190 (2014)
55. Optimization of Plasma Treatment for Enhanced Filler Matrix Adhesion in Manufacturing Green Composites with Rice Husk By Ajoy K. Chanda, Swati Neogi and Sudarsan Neogi *Indian Chemical Engineer* (2013)
56. Oxidation of Catechol using Titanium Silicate(TS-1) Catalyst By Debarpita Ghoshal, Jayanta Kumar Basu, and Sonali Sengupta *Bull. Chem. React. Eng. & Catal.* 8(2), 167-177 (2013)
57. Percolation of high-density polymer regions in nanocomposites: the underlying property for mechanical reinforcement By Venkat Padmanabhan *Journal of Chemical Physics* 139 (2013)
58. Performance study of extraction and oxidation-extraction coupling processes in the removal of thiophenic compounds By Uttam Maity, Jayanta Kumar Basu, and Sonali Sengupta *Fuel processing Technol* 121,119-124 (2014)
59. Pressure Characteristics in a Flotation Column By Kamalendu Bhunia, Gautam Kundu and Dibyendu Mukherjee *International Journal of Chem Tech research, CODEN(USA), ISSN: 0974-4290* Vol.6, No. 1, pp 276 (2014)
60. Production of Hydrogen by Steam Reforming of Ethanol over Alumina Supported nano-NiO/SiO<sub>2</sub> Catalyst By Barnali Bej, Narayan C.Pradhan and Swati Neogi *Catalysis Today* (2014)



61. Production of hydrogen by steam reforming of methane over alumina supported nano-NiO/SiO<sub>2</sub> catalyst By Barnali Bej, Narayan C. Pradhan and Swati Neogi *Catalysis Today* Vol. 207, 28-35 (2012)
62. Progression of a thermal front in porous media of finite length due to the injection of an inert gas By Ruidas B.C., Ganguly S *Journal of Porous Media* 17(2) 179-184 (2014)
63. Removal of Chromium(VI) From Waste Water By Using Adsorbent Prepared From Green Coconut Shell By S Kumar, B. C. Meikap *Desalination and Water Treatment* 52, 3122–3132 (2014)
64. Role of polyethylene glycol with different solvents for tailor-made polysulfone membranes By S. R. Panda and S. De *Journal of Polymer Research* 20, 179-195 (2013)
65. Simulation and parametric study of post combustion CO<sub>2</sub> capture process using (AMP+ PZ) blended solvent By SK Dash, AN Samanta, SS Bandyopadhyay *International Journal of Greenhouse Gas Control* 21, 130-139 (2014)
66. Study of hydrodynamics and dry beneficiation characteristics of coal in the riser of a circulating fluidized bed reactor By M Das, R K Saha, B C Meikap *International Journal of Coal Preparation And Utilization* 33, 266–276 (2013)
67. Study of the effect of silica nanofillers on the sea-water diffusion barrier property of unsaturated polyester composites By Nilesh Maheshwari, Swati Neogi, Praveen Kumar M and Debdarsan Niyogi *Journal of Reinforced Plastics and Composites* Vol. 32, 998-1002 (2013)
68. Synthesis and in-situ observation of 3D Superlattices of gold nanoparticles using oil- in-water emulsion By Ankur Dutta, Jayanta Chakraborty, Puspanjali Sahu and B. L. V. Prasad *Journal of Colloid and Interface Science* Accepted (2014)
69. Thermally Tailored Gradient Topography Surface on Elastomeric Thin Films By Roy S, Bhandaru N, Das R, Harikrishnan G, R. Mukherjee *ACS Applied Materials and Interfaces* (in press) (2014)
70. Thermodynamic characterization of adsorption of lead(II) ions on activated carbon developed from tamarind wood from aqueous solution. By J. Acharya, A Kumar, B C Meikap *South African Journal of Chemical Engineering* 18, 70-76 (2014)
71. Ultra fast cooling and its effect on the mechanical properties of steel By Soumya S Mohapatra, Satya V Ravikumar, Ravi Ranjan, Shiv B Singh, Surjya K Pal and Sudipto Chakraborty *Trans. ASME J. Heat Transfer* 136(3) pp 032101-1-9 (2014)
72. Use of repeated phase transfer for preparation of thiol coated copper organosols at higher particle loading By Aabid Hussain Shaik and Jayanta Chakraborty *Colloid and Surfaces A: Physicochemical and Engineering Aspects* In Press (2014)
73. Viscosity Modeling of Medium Reactive Unsaturated Polyester Resin Used for Liquid Composite Moulding Process By Raghu Raja Pandiyan K. and Swati Neogi *Journal of Applied Polymer Science* Vol.125, 1400-140 (2012)

#### **Papers Presented in Conferences**

1. Augmenting Capillary Suction by Electrowetting for Cooling Applications, By Soubhik Kumar Bhaumik, Sunando DasGupta, *16th International Heat Pipe Conference*, Lyon, France, (2012)
2. Backstepping control of polymerization reactor, By Pinakpani Biswas, Amar Nath Samanta, *9th Asian Control Conference (ASCC), 2013*, Istanbul, (2013)
3. Benzothiophene oxidation using nanocrystalline Ti-beta catalyst, By Sonali Sengupta, Uttam Maity and Jayanta Kumar Basu, *66th Annual Session of IICHE (CHEMCON-2013)*, Institute of Chemical Technology, Mumbai, (2013)
4. Characterization of an Unsaturated Polyester Resin for Resin Transfer Moulding Process Simulation, By Raghu Raja Pandiyan K., Gautam Kundu, Swati Neogi, *International Conference on Hi-Tech Materials (ICHTM-09)*, , (2009)
5. Characterization of Long Fiber Polypropylene Thermoplastic Composites for Automotive Application, By Swati Neogi, *Proceedings of the JEC forums in Singapore*, Singapore, (2008)
6. Characterization of Long Fiber Thermoplastic Composites, By Sudhanshu and Neogi S., *Proceedings of Chemcon*, , (2007)

7. Effect of solids on gas holdup characteristics in flotation column, By Kamalendu Bhunia, G. Kundu and D. Mukherjee, *8th International Conference on Multiphase Flow (ICMF 2013)*, Jeju, Korea, (2013)
8. Effect of Solids on Gas Holdup Characteristics in Flotation Column: Addition of Hydrophilic and Hydrophobic Solids, By Kamalendu Bhunia, G. Kundu, and D. Mukherjee., *8th International Conference on Multiphase Flow – ICMF 2013*, Jeju, Korea, (2013)
9. Enhancement in solute release from hydrogel scaffold, By Bal S., Ganguly S., *Chemcon (IChE)*, Mumbai, (2013)
10. Functional polymeric membranes, By S. De, *CHEMCON 2013*, ICT Mumbai, (2013)
11. Gas-liquid Downflow in millichannels, By Somen Das, Amit Kumar, Gargi Das, *Chemcon*, Chandigarh, (2012)
12. Hydrodynamic Investigation of Gas-Liquid flow through pipe fittings in mill channels, By K.Guha Biswas, R.V Chakradhar, J.K Basu, G. Das, *SCHEMCON*, IIT Gauhati, (2012)
13. Hydrodynamics of flotation column using sphalerite fines, By Kamalendu Bhunia, G. Kundu, and D. Mukherjee, *International Seminar on Mineral Processing Technology 2013, MPT-2013*, Bhubaneswar, India, (2013)
14. In Silico Analysis of Bioethanol Production by Microbial Consortia: Effect of Genetic Modifications, By K. P. Lisha and Debasis Sarkar, *CHEMCON 2013*, Mumbai, India, (2013)
15. Influence of Initiator and Promoter on Gel Time and Exotherm Behaviour of an Unsaturated Polyester Resin, By Raghu Raja Pandiyan K., Gautam Kundu, Swati Neogi, *CHEMCON*, (2009)
16. Interrogating the effect of bends on liquid-liquid slug flow in capillaries – a means for process intensification, By Koushik Guha Biswas, Jayanta Kumar Basu, Subhabrata Ray, Gargi Das, *8th Int Conf on Multiphase Flow, 2013*, Jeju Island, S. Korea, (2013)
17. Liquid-Liquid flow through tubes and tube fittings in milli channels, By K. Guha Biswas, S. Majumdar, J.K. Basu, G. Das, *Chemcon*, Chandigarh, (2012)
18. Multi-Objective Optimization of a Combined Cooling and Anti-Solvent Crystallization Process, By Kashinath Barik and Debasis Sarkar, *CHEMCON 2013*, Mumbai, India, (2013)
19. On the bubble surface area flux of a laboratory flotation column, By Kamalendu Bhunia, Gautam Kundu and Dibyendu Mukherjee, *International Mining Congress and Exhibition of Turkey (IMCET 2013)*, Antalya, Turkey, (2013)
20. On the Bubble Surface Area Flux of a Laboratory Flotation Column – A Statistical Analysis, By Kamalendu Bhunia, Gautam Kundu and Dibyendu Mukherjee, *23rd International Mining Congress And Exhibition of Turkey – IMCET 2013*, Antalya, Turkey, (2013)
21. Pattern formation during outflow of granular material from a narrow rectangular conduit, By Ritwik Maiti, G. Das and P.K.Das, *ICMF 2013*, Jeju Island, S. Korea, (2013)
22. Pd<sup>2+</sup> ion substituted CeO<sub>2</sub> as ligand free Palladium catalyst for Suzuki-Miyaura cross-coupling reactions, By Gruber-Woelfler H, Lichtenegger G, Deshpande PA, Khinast J, *Jahrestreffen der Deutschen Katalytiker*, Weimar, (2014)
23. Simulation of Air Entrapment and Curing Time During Manufacturing of Composite Cab Front by Resin Transfer Moulding Process, By Raghu Raja Pandiyan K., Gautam Kundu, Swati Neogi, *A National Conference on Emerging Trends in Composite Materials and Technology, INCCOM-8, ISAMPE*, (2009)
24. Stability of Mixing-Limited Patterns in Homogenous Autocatalytic Reactions, By Tanmoy Sanyal and Saikat Chakraborty, *AIChE Annual Meeting*, San Francisco, USA, (2013)
25. Synthesis and Characterization of Nano-NiO Catalyst Dispersed Over CeZr<sub>1-m</sub>O<sub>2</sub> Support, By Sudip Das, Sujoy Bepari and Narayan C Pradhan, *CHEMCON-2013*, Institute of Chemical Technology, Mumbai, (2013)
26. Visible light assisted photocatalytic mineralization of Reactive Red 180 dye using titania-zirconia nano composite catalyst, By Lipika Das, Rupesh Tamgadge and Jayanta Kumar Basu, *66th Annual Session of IICHE (CHEMCON-2013)*, Institute of Chemical Technology, Mumbai, (2013)

## Department of Chemistry

### **Head**

Prof. Dipak Ranjan Mal

### **Professors**

Bandyopadhyay, Sanjoy	<i>Ph.D.(IISc Bangalore)</i> , Protein folding, Theoretical and Computational Chemistry, Hydration properties of bio-molecules, Self-assembled molecular films at interfaces, Protein-ligand complexes, Phospholipid membranes, Cyclodextrin-guest interaction
Basak, Amit	<i>Ph.D.(Cal),D.Phil.(Oxon)</i> , Bioorganic/Medicinal Chemistry/Selective protein capture/Synthetic Chemistry
Bhattacharjee, Manish	<i>Ph.D.(NEHU)</i> , Catalysis, Synthetic Inorganic Chemistry
Biradha, Kumar	<i>Ph.D.(Hyderabad)</i> , Gas sorption studies, Supramolecular Chemistry, Crystal Engineering, Polymorphism, Coordination Polymers, Structural Chemistry, Solid state reactions, Soft materials
Chattaraj, Pratim Kumar	<i>Ph.D.(IIT Bombay)</i> , Density functional theory, Chemical reactivity, ab initio calculations, Quantum chaos, Aromaticity in metal clusters
Dasgupta, Swagata	<i>Ph.D.(RPI New York)</i> , Protein-protein and Protein-small molecule interactions
Dey, Joykrishna	<i>Ph.D.(Kanpur)</i> , Molecular Self-assembly, Colloidal Drug Delivery Systems, Polymer-Surfactant Interactions, Organogels and Hydrogels of Low-Molecular-Weight Amphiphiles
Hajra, Saumen	<i>Ph.D.(Pune Univ)</i> , Catalytic Asymmetric Reactions, Organocatalysis, Total Synthesis of Biologically Active Compounds
Mal, Dipak Ranjan	<i>Ph.D.(Missouri)</i> , Benzannulation and Hauser annulation, Lateral lithiation Michael-initiated ring closure, Total synthesis of bioactive natural products: angucyclines anthracyclines carbazoles quinonoids, Oxidative dearomatization
Pal, Tarasankar	<i>Ph.D.(Burdwan Univ.)</i> , <i>D.Sc.(Visva Bharati Uni)</i> ,
Pathak, Tanmaya	<i>Ph.D.(Uppsala Sweden)</i> , Carbohydrates. Nucleosides. Heterocycles. Carbocycles. Dinucleosides as RNase A inhibitors
Pramanik, P	<i>Ph.D.(IIT Kharagpur)</i> , Nanoscience and Nanotechnology, Material Chemistry
Raj, C Retna	<i>Ph.D.(M.K Univ Madurai)</i> , Optical and electrochemical sensors, Electrocatalysis and fuel cell, Inorganic multifunctional nanomaterials, Energy conversion and storage devices
Ray, Debashis	<i>Ph.D.(Jadavpur Univ)</i> , High nuclearity coordination cages., Solution coordination chemistry crystallization and crystal structures., Coordination driven supramolecular metal complex chemistry., Cluster coordination chemistry., Synthesis of ferromagnetic and single molecule magnetic metal complexes., Interaction of DNA and cleavage by heterometallic alkali metal-transition metal clusters., Self-assembly of dinuclear copper(II)

motifs and mechanochemical core conversions., Multimetallic constellation through lignad arm hydrolysis., Coordination driven fluorescence enhancement.

- Ray, Jayanta Kumar *Ph.D.(Calcutta Univ)*, Synthetic Organic Chemistry
- Sarkar, Nilmoni *Ph.D.(Jadavpur Univ)*, Characterization of Ionic Liquid containing Microemulsion, Photoinduced electron transfer in RTIL and RTIL containing confined media., Photophysics and Photodynamics of biologically relevant molecules, Excited state intramolecular proton transfer in organized assemblies, Characterization of surface active ionic liquids, Fluorescence Correlation Spectroscopy, Fluorescence lifetime imaging microscopy in single molecular level
- Sarkar, Tarun Kumar *Ph.D.(Calcutta Univ)*, Synthetic Organic and Organometallic Chemistry
- Srivastava, Suneel Kumar *Ph.D.(IIT Kharagpur)*, Semiconducting/Magnetic Nanomaterials, Polymer Nanocomposites
- Taraphder, Srabani *Ph.D.(IISc Bangalore)*, Theoretical Physical Chemistry, Computer Simulation of Charge Transfer Processes, Theoretical Modelling of Functionalized Carbon Nanotubes
- Associate Professors**
- Mahanty (Pathak), Amita *Ph.D.(IIT Kharagpur)*, Synthesis and Characterization of Inorganic Nanomaterials and their Biological Application
- Mani, Ganesan , Anion Receptors, Organometallic Chemistry
- Nag, Ahindra *Ph.D.(Jadavpur Univ)*, Synthesis and Characterization of Natural Occurring Polyphenols
- Nanda, Samik *Ph.D.(IICT-Hyderabad)*, Application of enzymes and microorganisms in organic synthesis, Total synthesis of complex natural products, Asymmetric synthesis
- Singh, N D Pradeep *Ph.D.(Madras Univ.)*, Development of fluorescent photoremovable protecting groups, Generation of Photoresponsive surfaces and their applications, Two photon induced nanocarrier for regulated drug delivery, Light induced controlled release of agrochemicals, Visible light induced photocatalysis for organic transformation
- Assistant Professors**
- Ayyappan, Anoop *Ph.D.(Univ. of Hyderabad)*, Computational Chemistry, Reaction Mechanisms, QM/MM studies of biological systems, Computational Photochemistry
- Das, Madhab Chandra *Ph.D.(IIT Kanpur)*, Porous Metal/Covalent Organic Frameworks (MOFs/COFs)
- Dhara, Dibakar *Ph.D.(Osmania Univ. Hyderabad)*, Synthetic Polymer Chemistry, Colloids and Nanomaterials, Physical Chemistry of Macromolecules
- Halder, Mintu *Ph.D.(IACS Kolkata)*, Experimental Physical Chemistry, Biophysics, Photophysics of Nano-materials, Spectroscopy

Maji, Modhu Sudan	<i>Ph.D.(Germany)</i> , Dual Catalysis & Asymmetric Synthesis (merging organo-catalysis with transition metal catalysis), Ru- and Pd-catalyzed selective C-H bond functionalization, N-tert.-butanesulfinyl imine in the synthesis of bio-active natural products, Multi Component Reaction in the light of Dual Catalysis
Mishra, Sabyashachi	<i>Ph.D.(Tech. Univ., Munich, Germany)</i> , Theory of Relativistic Vibronic Coupling in Molecular Physics, Relativistic Quantum Chemistry, Molecular Structure and Spectroscopy in Excited States, Reactive Processes in Biology, Network Dynamics in Bio-(chemical/physical) processes
Patra, Sanjib Kumar	<i>Ph.D. (IIT Kanpur)</i> , Inorganic Chemistry, Functional Polymer Chemistry, Organometallic Chemistry, Materials Chemistry
Rajakumar Ananthakrishnan	<i>Ph.D.(M.K.Univ., Madurai)</i> , Analytical Methods for the detection of heavy metals/ROS in AOP., Preparation of hybrid/nanomaterials for photocatalysis and surface applications, Green Methodology for Selective Organic Transformation/photodegradation under visible light.
Samanta, Rajarshi	<i>Ph.D.(Osmania Univ. ICT)</i> , Transition metal catalysis, Asymmetric synthesis, Total synthesis of natural products, Natural product inspired compound library

#### ***Faculty Appointments***

Modhu Sudan Maji	Assistant Professor
Madhab Chandra Das	Assistant Professor

#### ***Faculty Re-employment***

T K Sarkar	Professor
P Pramanik	Professor

#### ***Brief Description of on-going activities***

The department is actively pursuing research embracing both basic and applied aspects of chemistry. Currently, the department is handling over 40 sponsored projects from various agencies. The department is equipped with various sophisticated instruments: Bruker APEX SMART CCD Single Crystal diffractometer, Bruker AVANCE II 400 MHz and AVANCE II 200 MHz spectrometer, Shimadzu DT-40 model 883 IR Spectrometer, PW-17291710 X-Ray Diffractometer, Cyclic Voltammeter Model P9001, Chrompac Gas Chromatograph and JASCO DIP 370 digital polarimeter, Spex Fluorolog 3 fluorimeter, and a Perkin Elmer C, H, N Analyzer. Active research in synthetic chemistry is underway on the design and synthesis of novel enediynes as DNA cleaving agents, on the total synthesis of bioactive natural products such as anthracyclines, angucyclines, furocoumarins, indole alkaloids, furoterpenes, lactams and heterocyclic quinonoids. Enzyme mediated synthesis and a substrate analog approach to determine the active site of enzymes is being studied as is the enzyme inhibition approach to drug design. Isolation and characterization of an angiogenic protein is in progress with an aim to determine the specificity by studying several dinucleotide substrates. Supramolecular chemistry relating to thia azarenes and redox switchable receptors is in progress. Development of highly selective and green methodologies based on organometallic, radical and chiron approaches. In the area of catalysis, micellar, zeolite, and bimetallic catalysts are being developed. Early transition metal based catalysts for aqueous medium polymerization and cationic

ruthenium complexes as catalysts for various organic transformations. Synthesis of advanced functional materials for fuel cell application. Electrocatalyst for oxygen reduction and methanol oxidation. Development integrated biosensing platform clinical and environmental applications. In the field of Bioinorganic chemistry, research is being pursued on electron transfer processes with emphasis in dioxygen chemistry. Active research is also underway in the areas of crystal engineering and electroanalytical chemistry. Notable research on various aspects of nanochemistry involve development of metal nanoparticles, nanocrystalline ferrites, ceramics and composites. Materials for high temperature and superconducting applications and solar energy conversion is also underway. Catalysis involving photoactivation techniques and micelle stabilized nanoparticles are currently being investigated to solve environmental pollution related problems. Colloidal systems, especially vesicles formed by chiral surfactants and their potential applications in i.v drug delivery are being studied. Active research is also being carried out on the development of hydrogels and organogels for applications in transdermal drug delivery. Investigation of solution properties of a number of polymers using a variety of tools is in progress. Studies are also being conducted on the aggregation behavior of polyelectrolytes and block copolymers in aqueous media. Capillary electrophoresis is being employed for the chiral separation of drugs. Photophysical studies of different organic molecules in pure solution and organized assemblies are being investigated using fluorescence spectroscopy. Theoretical physical chemistry in the department includes studies relating to density functional theory, chemical reactivity, ab initio calculations, quantum chaos; chemical reaction dynamics in liquids and biological macromolecules, molecular modeling and computer simulation studies of complex biological systems such as: membranes, proteins etc. Protein structure analysis on the loop regions in proteins is also underway.

#### ***Thrust Areas***

1. Biomimics
2. Transition Metal Cluster Complexes
3. Structural Coordination Chemistry
4. Ferromagnetic Metal Complexes
5. Drug Design and Delivery
6. Chemical and Electrochemical Sensors
7. Molecular Modeling
8. Protein Folding & Enzymatic Catalysis
9. Spectroscopy of Assemblies
10. Green Chemistry
11. Nanochemistry
12. Catalysis

#### ***New Acquisitions***

1. Fluorimeter
2. GC-MS
3. UV-visible with NIR
4. FLIM
5. CD
6. FESEM
7. High Performance Computing Platform

#### ***Lectures by Visiting Experts***

1. Strategy Toward the Synthesis of Bioactive Natural Products and Related Compounds *by* Dr. Samaresh Jana (School of Applied Science, KIIT University, Bhubaneswar)

2. Designer Supported Metal Nanoparticles for Heterogeneous Catalysis Applications *by* Dr. Lokesh Kesavan (Aalto University (formerly known as Helsinki University of Technology), Finland)
3. FESEM - basics and its applications *by* Dr. Karthick Balasubramanian (ICON Analytic)
4. Advanced modeling of ions in solutions and biological environment *by* Dr. Arindam Bankura (Department of Chemistry (Institute for Computational Molecular Science) at Temple University, Philadelphia, U.S.A)
5. Application of Biocatalysis in organic synthesis *by* Dr. Anju Chadha (IIT-Madras)
6. Simple Molecules and Simple Chemistry Yield Complex Materials Through Self-Assembly *by* Prof. Richard G. Weiss (Georgetown University, Washington DC, USA)
7. Supramolecular Assemblies in Organo-catalysis by Ionic Liquids *by* Prof. Asit Chakraborti (Medicinal Chemistry, NIPER, Chandigarh)
8. Approaches toward activation of the C-H bond in methane *by* Prof. A. G. Samuelson (Department of IPC, IISC Bangalore)
9. Proteolytic Enzymes of PCSK Family in Health and Diseases: Implications and Disease Intervention Strategies *by* Prof. Ajoy Basak, (University of Ottawa, Canada)
10. Development of New Synthetic Methods en route to Some Glycosidase Inhibitors *by* Prof. Y. D. Vankar (Dept. of Chemistry, IIT-Kanpur)
11. Anharmonic Molecular Vibrations: A Journey from Small to Large Systems *by* Dr. Tapta Kanchan Roy (The Hebrew University of Jerusalem, Israel)
12. Li-ion battery materials–Syntheses and Electrochemistry *by* Dr. Sreeraj Puravankara (Technical University Munich, Germany)
13. NHC-Organocatalysis in Novel C-C and C-Heteroatom Bond-forming Reactions *by* Dr. G. Vijay Nair (NIIST-Trivandrum)
14. Mechanotransduction through force-modulated ligand binding affinity *by* Dr. Sudipta Samanta (MIT, Cambridge, Massachusetts, USA)
15. Stereoselective synthesis of bioactive aza-, carbo- and oxacyclic compounds via enolateanions and dianions *by* Prof. Manas Ghorai (Dept. of Chemistry, IIT-Kanpur)
16. Nanotechnology and Cancer *by* Prof. D. Bahadur (Institute Chair Professor, Metallurgical Engineering & Materials Science, IIT Bombay)
17. Transition Metal Complexes Encompassing Synthetic Bioinorganic Model Study and Water Splitting Chemistry *by* Dr. Sukanta Mandal (Department of Chemistry, Assam University, Silchar)
18. A new vista towards parasitic protozoan Leishmania and Trypanosoma spp. *by* Dr. Sridhara Gupta (Department of Chemistry,)
19. Understanding and Interfering with the Conformational Transitions of the Full-Length Amyloid- $\beta$  Monomer: Insights from Computer Simulations *by* Dr. Neelanjana Sengupta (Physical Chemistry Divn, NCL Pune)
20. From Peptidomimetics to Proteins: Conformational Analysis of Peptoids and Profiling of Aldehyde Decarboxylase *by* Dr. Bishwajit Paul (University of Michigan, Department of Chemistry)
21. Functionalized Nanomaterials for Supramolecular Application *by* Dr. Mrinmoy De (Northwestern University)
22. Domino Reactions with Three-Membered Rings and Triple Bonds *by* Dr. Daniel Werz (Technical University Braunschweig, Institut für Organische Chemie)
23. Simulating at Multiple Scales: Application to Chemistry and Biophysics *by* Dr. Jagannath Mandal (Department of Chemistry, Columbia University, USA)
24. Understanding Mechanism in Organometallic Reactions Experimental and computational methods *by* Prof. A. G. Samuelson (Department of IPC, IISC Bangalore)
25. Soft tunable materials in a bottom-up approach with specific molecular recognition *by* Dr. Asish Pal (Stratingh Institute of Chemistry, University of Groningen, The Netherlands)
26. Preview of Semiconductor Manufacturing - A look Inside Intel *by* Dr. Suddhasattwa Nad (Intel, USA)

27. Computing the relative stabilities and the per-residue components in protein conformational changes *by* Dr. Arijit Roy (Laufer Center for Physical and Quantitative Biology, Stony Brook University)
28. Design and Photoreactivity of Coordination Polymers *by* Prof. J. J. Vittal (National University of Singapore)
29. RNA molecules as potential targets of alkaloids: Understanding the binding of alkaloids to different RNAs *by* Dr. G. Suresh Kumar (Indian Institute of Chemical Biology, Kolkata)
30. Understanding and Interfering with the Conformational Transitions of the Full-Length Amyloid- $\beta$  Monomer: Insights from Computer Simulations *by* Dr. Neelanjana Sengupta (Physical Chemistry Divn, NCL Pune)
31. Mechanotransduction through force-modulated ligand binding affinity *by* Dr. Sudipta Samanta (MIT, Cambridge, Massachusetts, USA)
32. Energetics of charge transport processes in trans-membrane proteins: A molecular perspective *by* Dr. Suman Chakraborty (NCL, Pune)
33. Computational Investigations into Small Molecule Activation *by* Dr. Kumar Vanka (NCL, Pune)
34. From Peptidomimetics to Proteins: Conformational Analysis of Peptoids and Profiling of Aldehyde Decarboxylase *by* Dr. Bishwajit Paul (University of Michigan, Department of Chemistry)
35. Functionalized microporous and mesoporous materials for high CO<sub>2</sub> uptake *by* Prof. Asim Bhowmick (IACS-Kolkata)
36. Contemporary developments in nonadiabatic chemical dynamics *by* Prof. Susanta Mahapatra (University of Hyderabad)
37. Synthetic Approaches to the Architecturally Interesting Indole Based Alkaloids via Intramolecular-Dehydrogenative-Coupling (IDC)" *by* Dr. Alakesh Bisai (IISER-Bhopal)
38. Cellular targets of Guanidino phthalocyanines *by* Dr. BYR Vummidi (University of Zurich, Switzerland)
39. Functionalized Nanomaterials for Supramolecular Application *by* Dr. Mrinmoy De (Northwestern University)
40. NHC-Organocatalysis in Novel C-C and C-Heteroatom Bond-forming Reactions *by* Dr. G. Vijay Nair (NIIST-Trivandrum)
41. Information Session on Opportunities to do PhD in Chemistry at the National University of Singapore *by* Prof. J. J. Vittal (National University of Singapore)
42.  $\pi$ -Conjugated Carbon Materials for Potential Electronic Applications" *by* Dr. Chandrani Pramanik (Department of Chemistry & Materials Science University of New Hampshire, Durham, USA)
43. Application of Biocatalysis in organic synthesis *by* Dr. Anju Chadha (IIT-Madras)
44. Synthetic Approaches to the Architecturally Interesting Indole Based Alkaloids via Intramolecular-Dehydrogenative-Coupling (IDC)" *by* Dr. Alakesh Bisai (IISER-Bhopal)
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47. Energetics of charge transport processes in trans-membrane proteins: A molecular perspective *by* Dr. Suman Chakraborty (NCL, Pune)
48. Computational Investigations into Small Molecule Activation *by* Dr. Kumar Vanka (NCL, Pune)
49. Microcapsules and Micropumps: A Chemical Approach for Designing Microscale Container/ Devices *by* Dr. Debabrata Patra (Pennsylvania State University, USA)
50. Synthetic Studies of Macrolides and Their Analogues *by* Dr. P. Srihari (IICT-Hyderabad)
51. Study of C-X (X= H, O, F, S) Bond Activation by Ir and Pt Complexes and Related Chemistry *by* Dr. Sabuj Kundu (Dept. of Chemistry, University of North Carolina, USA)
52. Chemical Biology: applying chemistry to biological questions *by* Dr. Devraj Subramanian ()



53. Development of fluorogenic bio-application based on supramolecular interactions *by* Dr. Kalyan K. Sadhu (Institut de Science et d'Ingénierie Supramoléculaires, Université de Strasbourg, France)
54. Application of Self-Assembly Strategies in Artificial Photosynthesis *by* Dr. Kingsuk Mahata (Institut für Organische Chemie, Universität Würzburg, Am Hubland, 97074 Würzburg, Germany)
55. From Peptidomimetics to Transition Metal Catalysis *by* Dr. Prantik Maity ()
56. Rational Design of Potential Apoptotic and Antioxidant Agents: Structure-Activity Correlation Studies *by* Dr. Krishna Pada Bhabak (University of Oxford, U. K.)
57. Effect of Azobenzene Isomerisation on DNA Stability *by* Dr. Mithun Biswas (Institut für Physikalische u. Theoretische Chemie, Goethe-Universität, Max-von-Laue-Str.7)
58. Visible Light Photoredox Catalysis & Synthetic Studies on Natural Products *by* Dr. Soumitra Maity (Dept. of Chemistry, University of California-Berkeley)
59. Self-assembly of Functional Molecules: Supramolecular gels, Vesicular Chemosensors and pH-responsive Materials *by* Dr. Supratim Banerjee (Institut für Organische Chemie, Universität Duisburg-Essen, Germany)
60. Cellular targets of Guanidino phthalocyanines *by* Dr. BYR Vummidi (University of Zurich, Switzerland)
61. Programming Stereochemistry at all Carbons of Cyclohexane Rings: Total Synthesis of Structurally Complex Alkaloids *by* Prof. G. Pandey (NCL-Pune)
62. Stereoselective synthesis of bioactive aza-, carbo- and oxacyclic compounds via enolate anions and dianions *by* Prof. Manas Ghorai (Dept. of Chemistry, IIT-Kanpur)
63. Effect of Azobenzene Isomerisation on DNA Stability *by* Dr. Mithun Biswas (Institut für Physikalische u. Theoretische Chemie, Goethe-Universität, Max-von-Laue-Str.7)
64. New Approaches to Asymmetric Nucleophilic Catalysis and the Development of Redox-Neutral Reaction Cascades *by* Dr. Chandra Kanta De (Michigan Max-Planck-Institut für Kohlenforschung, Germany)
65. Enzyme Linked Immunoassay for Medical Diagnostics *by* Dr. Samar Kundu (USA)
66. Ring expansions and rearrangements on monosaccharides *by* Prof. N. Jayaraman (Department of Organic Chemistry, IISc Bangalore)
67. Transport, Magnetic and Optical Properties of Graphene Nanoribbons and Decorated Graphenes *by* Prof. Swapan K Pati, FASc, FNASc (Theoretical Sciences Unit, JNCASR, Bangalore)
68. Unraveling biomolecular interactions: Calorimetry and Spectroscopy *by* Prof. Nand Kishore (Department of Chemistry, IIT Bpmby)
69. Alzheimer's Disease and Human Dementia: What do we learn from research *by* Prof. Ajoy Basak, (University of Ottawa, Canada)

#### ***Doctoral and MS Degrees Awarded***

1. Ghosh, Sourov : Synthesis and Electrocatalytic Activity of Pt and Pt-Pd Bimetallic Nanoparticles for Low Temperature Fuel Cell Applications(Ph.D)
2. Karmakar, Raju : Total synthesis of chlorocyclinone A, the first PPAR-gamma antagonist of natural origin; unfolding of a Prins reaction, and synthesis of pestacin methyl ethers(Ph.D.)
3. Nandan Jana : Synthetic Studies Towards Resorcylic Acid Lactones (RALs) and Stagonolides(Ph.D.)
4. Debjit Das : Heterometallic Catalysis within Palladium-Tin Domain: Carbon-Carbon and Carbon-Heteroatom Bond Formation(Ph.D)
5. Atanu Singha Roy : Interactions of dietary polyphenols and their copper complexes with serum albumins: Effects of glycation and binding with DNA(Ph.D)
6. Jana, Nandan : Synthetic Studies Towards Resorcylic Acid Lactones (RALs) and Stagonolides(Ph.D.)

7. Chinmoy -Dicarbonyl and  $\beta$ Manna : Functionalization of Carbohydrates with Related Reagents: Synthesis of C-Nucleosides, Densely Functionalized Carbocycles and Complex Polyheterocyclic Scaffolds(Ph.D.)
8. Bratati Pradhan : 2D and 3D Nanofiller Reinforced Silicone Rubber Nanocomposites: Preparation, Characterization and Properties(Ph.D)
9. Rajib Bhuniya : Asymmetric Synthesis of Rasfonin, Loxoprofen, Venlafaxine and Small Ring Carbocycles and Heterocycles(Ph.D)
10. Ramendra Sundar Dey : Functional Molecular Assemblies and Nanomaterials for the Development of Electrochemical Sensing and Bio-sensing Platforms(Ph.D.)
11. Amrita Pal : Synthesis and Applications of Biocompatible, Stimuli-Responsive Physical Gels Based on Amino Acids and Peptides(Ph.D)
12. Sanghamitra Atta : Photochemistry of N-hydroxyphthalimide Carbonates: An Efficient Method for the Generation of Alkoxy Radicals and Control release of pesticides by visible light(Ph.D.)
13. Sandipan Roy : Supramolecular Approach towards the Design and Synthesis of Functional Materials: Exploration of Cocrystals, Salts and Coordination polymers(Ph.D.)
14. Debasish Ghorai : Transition Metal Complexes of Pyrrole-Based NNN-Pincer and Polydentate Ligands(Ph.D)
15. Banalata Sahoo : Design and Synthesis of Multifunctional Nanoparticles for Biocatalysis and Targeted Delivery of Anticancer Drug(Ph.D)
16. Uttam Kumar Das : Synthesis and Catalytic Activity of Cationic Ruthenium Complexes: Carbon-Heteroatom and Carbon-Carbon Bond Formation via Activation of Terminal Alkynes(Ph.D)
17. Nagaprasad Puvvada : Design and Synthesis of Biocompatible Nanoparticles for Targeted Drug Delivery for Cancer Treatment(Ph.D)
18. Nitin Kumar Pandey : A study on the fibrillation of human serum albumin in the presence of external factors(Ph.D)
19. Sudeshna Ghosh : Studies on Hen egg white lysozyme aggregation in presence of additives: Binding of preformed fibrils with nucleic acids(Ph.D.)
20. Shanish Kumar : Group 10 and 11 Metal Complexes Bearing New Pyrrole-based Diphosphine Ligands and Chromium(III) Complexes Containing 3,5-Dimethylpyrazolate Ligand(Ph.D)
21. Debanjana Dey : Syntheses and Reactivities of Vinyl Sulfoxide-modified Carbohydrates, Vinyl Sulfone- and Vinyl Sulfoxide-modified Tetrahydrofurans(Ph.D)
22. Ashish Kumar Sahoo : Elemental and Binary Semiconducting Nanomaterials of Diverse Morphology: Synthesis and Application(Ph.D)
23. Debasish Jana : PYRROLE-BASED MACROCYCLIC, AND MACROBICYCLIC ANION RECEPTORS BY THE MANNICH AND SCHIFF BASE CONDENSATION REACTIONS(Ph.D)

#### ***Member - Professional Bodies***

1. Mahanty (Pathak), Amita, *Member* - Asian Nanoscience and Nanotechnology Association (ANNA) and Academy of Nanoscience and Nanotechnology (ANN)
2. Pathak, Tanmaya, *member* - The Association of Carbohydrate Chemists and Technologists
3. Pathak, Tanmaya, *Member* - Indian Chemical Society
4. Pathak, Tanmaya, *Member* - Chemical Research Society of India
5. Pathak, Tanmaya, *member* - Indian Association for the Cultivation of Science
6. Bandyopadhyay, Sanjoy, *Life Member* - Chemical Research Society of India
7. Raj, C Retna, *Life Member* - Chemical Research Society of India
8. Raj, C Retna, *Life Member* - Indian Society of Electroanalytical Chemistry
9. Raj, C Retna, *Member* - Electrochemical Society
10. Rajakumar Ananthkrishnan, *Life Member* - Society of Environmental Chemistry and Allied Sciences (SECAS)

11. Rajakumar Ananthkrishnan, *Life Member* - Materials Research Society of India (MRSI)
12. Dhara, Dibakar, *Life Member* - Society of Polymer Science, India
13. Dhara, Dibakar, *Life Member* - Materials Research Society of India
14. Ayyappan, Anoop, *Member* - WATOC - World Association of Theoretical and Computational Chemists
15. Patra, Sanjib Kumar, *Member* - Canadian Society of Chemistry
16. Patra, Sanjib Kumar, *Member* - American Chemical Society
17. Patra, Sanjib Kumar, *Life member* - Chemical Research Society of India
18. Mishra, Sabyashachi, *Member* - Indian Chemical Research Society
19. Srivastava, Suneel Kumar, *Life member* - Academy of Microscopic Science and Technology
20. Srivastava, Suneel Kumar, *Life member* - Society for Polymer Science, India
21. Srivastava, Suneel Kumar, *Life member* - Materials Research Society of India
22. Nag, Ahindra, *Editorial Member* - Biointerface Research in Applied Chemistry
23. Mal, Dipak Ranjan, *Member* - American Chemical Society
24. Mal, Dipak Ranjan, *Life member* - Chemical Research Society of India
25. Mal, Dipak Ranjan, *Life member* - Indian Chemical Society
26. Chattaraj, Pratim Kumar, *Member* - Nomination Council for the Russnano Prize
27. Chattaraj, Pratim Kumar, *Member: Nomination Panel* - Ahmed Zewail Prize, Chemical Physical Letters, Elsevier
28. Chattaraj, Pratim Kumar, *Member* - International Scientific committee of the 10th Congress of the World Association of Theoretical and Computational Chemists (WATOC 2014)
29. Chattaraj, Pratim Kumar, *Member: Nomination Panel* - Tetrahedron Young Investigator Award, Elsevier
30. Chattaraj, Pratim Kumar, *Member* - Key Opinion Leaders Panel, Nature Collections (Chemical Sciences, Nature Publishing Group), Macmillan Scientific Communications, UK
31. Ray, Debashis, *Life Member*. - Chemical Research Society of India (CSRI), Bangalore
32. Ray, Debashis, *Life Member*. - Indian Chemical Society, Kolkata.
33. Ray, Debashis, *Life Member*. - Indian Association for the Cultivation of Science, Kolkata.
34. Dasgupta, Swagata, *Member* - National Academy of Sciences India (NASI)
35. Dasgupta, Swagata, *Life Member* - Chemical Research Society of India
36. Taraphder, Srabani, *Life Member* - Chemical Research Society of India
37. Dey, Joykrishna, *Life Member* - Society for Polymer Science, India
38. Dey, Joykrishna, *Life Member* - Chemical Research Society of India
39. Dey, Joykrishna, *Life Member* - Indian Society for Radiation and Photochemical Sciences
40. Sarkar, Nilmoni, *life member* - Chemical Research Society of India
41. Sarkar, Nilmoni, *life member* - Indian Association for the Cultivation of Science
42. Sarkar, Tarun Kumar, *Life member* - CRSI

#### ***Member - Editorial Board***

1. Bandyopadhyay, Sanjoy (0) *Editorial Board member* - Mediterranean Journal of Chemistry
2. Bandyopadhyay, Sanjoy (0) *Editorial Board member* - Philisophic Nature
3. Biradha, Kumar (2010) *Editor* - Crystal Engineering Book Series
4. Biradha, Kumar (2011) *Editorial Advisory Board Member* - New Journal of Chemistry
5. Biradha, Kumar (2010) *Co-editor* - Acta Crystallographica, section E
6. Biradha, Kumar (2007) *Editorial advisory board member* - The Open Inorganic Chemistry Journal
7. Biradha, Kumar (2008) *Editorial Board Member* - New Journal of Chemistry
8. Biradha, Kumar (2010) *EBM* - Crystal Growth & Design Network
9. Chattaraj, Pratim Kumar (2010) *Member, Editorial Board* - Indian Journal of Chemistry - Section A
10. Chattaraj, Pratim Kumar (2010) *Member, Editorial Board* - Computational and Theoretical Chemistry
11. Dasgupta, Swagata (0) *Editorial Board Member* - Protein and Peptide Letters

12. Dasgupta, Swagata (2013) *Editorial Board member* - Journal of Luminescence and Applications
13. Mahanty (Pathak), Amita (2012) *Member* - International Journal of Nanotechnology and Applications (IJNA)
14. Mahanty (Pathak), Amita (2012) *Member* - International Journal of NanoScience and Nanotechnology (IJNN)
15. Mal, Dipak Ranjan (2012) *Member, Editorial Board* - Organic Chemistry International
16. Nag, Ahindra (2014) *Member of Editorial board* - Biointerface Research in Applied Chemistry
17. Pathak, Tanmaya (2012) *Member* - Biochemical Compounds
18. Raj, C Retna (2012) *Editorial Board member* - E-Journal of Chemistry
19. Rajakumar Ananthakrishnan (2011) *Associate Editor* - Environmental Chemistry Letters (Springer)
20. Rajakumar Ananthakrishnan (2013) *Associate Editor* - World Research Journal of Analytical Chemistry
21. Rajakumar Ananthakrishnan (2011) *Member of Editorial Advisory Board* - International Journal of Environmental Sciences
22. Srivastava, Suneel Kumar (0) *Editor* - Journal of Nano Energy and Power Research
23. Srivastava, Suneel Kumar (2013) *Associate Editor* - Journal of Nanoscience and Nanotechnology
24. Srivastava, Suneel Kumar (0) *Associate Editor* - Nanoscience and Nanotechnology Letters
25. Srivastava, Suneel Kumar (0) *Editorial Advisory Board Member* - Recent Patents on Nanotechnology

#### ***Awards & Honours***

1. Biradha, Kumar (2013) *2013 Associate Editor, Crystal Growth & Design, ACS*
2. Chattaraj, Pratim Kumar (2014) *Chemical Research Society of India Silver Medal*
3. Maji, Modhu Sudan (2013) *Cluster of Excellence UniCat Fellowship for Postdoctoral Research at Technical University Berlin, Germany.*
4. Raj, C Retna (2013) *CRSI Bronze Medal*
5. Dasgupta, Swagata (2013) *Darshan Ranganathan Memorial Lecture Award of Chemical Research Society of India*
6. Mal, Dipak Ranjan (2014) *Dr. R. K. Barua Memorial Lecture Gauhati University*
7. Maji, Modhu Sudan (2014) *DST-INSPIRE Faculty Award from the Department of Science and Technology, New Delhi, India.*
8. Chattaraj, Pratim Kumar (2013) *Elected member, National Council for the Infosys Prize*
9. Chattaraj, Pratim Kumar (2013) *Highest Citation Award (on the papers published in one year), IIT Kharagpur*
10. Chattaraj, Pratim Kumar (2013) *Member, FWO, Belgium*
11. Hajra, Saumen (2014) *Professor R. C. Shah Memorial Lecture*

#### ***Sponsored Research Projects***

1. A Journey to the Centre of Ribonucleases: Designing of Nucleoside-based Inhibitors (DBT, Rs.72.00 Lakhs)
2. A step towards the utilization of D-fructose, L-sorbose and 1,5-anhydro-D-fructose as chiral pools in synthetic chemistry. (CSIR, New Delhi, Rs.23.00 Lakhs)
3. A Value Chain on Aloe Vera Processing (ICAR, NAIP, Rs.385.00 Lakhs)
4. Application of high resolution NMR spectroscopy in complex chemical and biochemical systems (DST, Rs.205.00 Lakhs)
5. Artificial Protein cleaving agents (CSIR, Rs.16.00 Lakhs)
6. Asymmetric Catalysis: TOS/DOS of Nitrogen-Heterocycles (Department of Science and Technology (DST), Rs.52.90 Lakhs)

7. Asymmetric Syntheses of  $\gamma$ -Butyrolactone Natural Products (CSIR, New Delhi, Rs.26.28 Lakhs)
8. CATALYTIC HYDROLYSIS BY A MICROBIAL ENZYME WITH POTENTIAL OF AN ANTIBIOTIC TARGET (DST India, Rs.73.00 Lakhs)
9. Characterization of IonicLiquid containing microheterogeneous media and investigation of ultrafast processes in these confined media (CSIR, Rs.19.67 Lakhs)
10. Computational studies of gold catalyzed cycloaddition reactionos (ISIRD, Rs.5.00 Lakhs)
11. COOPERATIVITY IN LIGAND MIGRATION IN A DIMERIC MICROBIAL HEMOGLOBIN (ISIRD, SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
12. Crystal Engineering Studies on Derivatives Containing 2° Amide and Pyridine Functional Groups: Design and Applications (CSIR, Rs.11.00 Lakhs)
13. Design and Synthesis of Coordination Polymers and Coordination Induced Gelating Materials: Exploration of Gas Sorption and other Functional Properties (DST-SERB, Rs.54.00 Lakhs)
14. Design of Organic-Inorganic Hybrid Materials and Exploration of their Gas Adsorption and Disorption Properties (DST, Rs.49.00 Lakhs)
15. Design of Organic-Inorganic Hybrid Materials with Porous and/or Chiral Properties (DST, Rs.18.72 Lakhs)
16. Development and applications of polyolefin and polyolefinic rubber /hybrid filler nanocomposites (CSIR, Rs.17.92 Lakhs)
17. Development of Polypyrrolle/Disinfectant Nanocomposites for Effective Purification of Water (DRDO, Rs.5.16 Lakhs)
18. Development of Silicon Carbide supported Graphene-Polymer Nanocomposites for EMI Shielding Applications (DRDO, Rs.47.79 Lakhs)
19. Droplet based screening of amyloid beta peptide aggregation (DBT, Rs.49.50 Lakhs)
20. Epoxy reinforced inorganic material filled organic polymer composites in tribological applications (DRDO, Rs.24.56 Lakhs)
21. Fatty Acid Biosynthesis Inhibitors (DBT, Rs.70.00 Lakhs)
22. Garratt Braverman Rearrangemnet (DST, Rs.37.00 Lakhs)
23. Generation and Application of Photoaddressed surfaces (DST, Rs.50.00 Lakhs)
24. Gold catalyzed organic transformations: Applications to the synthesis of bioactive natural products (DST, Rs.29.16 Lakhs)
25. Group 10 Metal Complexes Bearing New NNN-Pincer Ligands for C-C Coupling Reactions (CSIR, Rs.1926000.00 Lakhs)
26. Hydroxymethylated cycloalkenones privileged small molecular chiral templates for asymmetric synthesis of bio-active natural products (DST, Rs.35.00 Lakhs)
27. Hydroxynitrile lyase biocatalysis: production of active pharmaceutical intermediates by substrate engineering (DBT, New-Delhi, Rs.20.00 Lakhs)
28. HYPOMAP new materials for hydrogen powered mobile applications (DST, Indo-Eu, New Delhi, Rs. 47.12 Lakhs: IIT KGP Share, Rs. 47.12 Lakhs, Rs.47.12 Lakhs)
29. Investigation of the self association of proteins under varying conditions (DST, Rs.31.70 Lakhs)
30. Investigations on development and properties of poly- olefinic elastomer nanocomposites (CSIR, Rs.13.50 Lakhs)
31. Molecular analysis of efflux pump mediated antibiotic resistance in Gram negative bacilli (MGB) (DBT, Rs.32.40 Lakhs)
32. MULTIFUNCTIONAL MATERIALS FOR ELECTROCHEMICAL ENERGY CONVERSION AND STORAGE DEVICES (DST, Rs.46.75 Lakhs)
33. New Functional group photolithography methods to pattern self assembled monolayers (SAM's) (DST, Rs.17.00 Lakhs)
34. New photoremovable protecting groups for self assembled monolayers (SAM's) (ISIRD, SRIC, Rs.5.00 Lakhs)
35. New Polymers and Polymer Composites : Design, Synthesis, and Advanced Applications (SRIC, Rs.250.00 Lakhs)

36. New Polymers and Polymer Composites : Design, Synthesis, and Advanced Applications (IIT Kharagpur:One-time Seed Grant for Research Infrastructure in an area of Emerging Thrust (SGDRI), Rs.0.00 Lakhs)
37. PHOTOELECTROCHEMICAL SENSORS BASED ON FUNCTIONAL MATERIALS (CSIR, Rs.22.28 Lakhs)
38. Pi-pi interactions in cyclization reactions (DST, Rs.21.00 Lakhs)
39. Role of water in predicting the protein folding-unfolding pathways: Computer simulation studies (Department of Science and Technology, Rs.26.65 Lakhs)
40. Seed Grant (ISIRD-SRIC, IITKGP, Rs.27.90 Lakhs)
41. Sesqui and Di Terpenoids by Palladacycles (DST, Rs.25.00 Lakhs)
42. Sir. J. C. Bose Fellowship (DST, New Delhi, Rs.68.00 Lakhs)
43. Spectroscopic and modeling investigations on specific weak molecular interaction... (DST-SERB, Rs.50.00 Lakhs)
44. Studies on Palladium Catalysed Heck Reactions (CSIR, Rs.15.00 Lakhs)
45. Studies on Protein-Metal Colloid Interactions by Raman Spectroscopy (DST (Co-PI), Rs.20.96 Lakhs)
46. Studies on Sonophotocatalytic Degradation of Persistent Organic Pollutants (POPs) in Aqueous System (DST, Rs.26.90 Lakhs)
47. Study of the behaviour of Oil Spill on Ocean surface through laboratory experiments, modeling and Satellite Images (MOES, Govt. of India, Rs.78.00 Lakhs)
48. Synthesis and Application of  $\pi$ -Conjugated Polymers for Bulk Heterojunction (BHJ) Solar Cells: Towards Cheap and Efficient Renewable Energy Sources (IIT KGP, Competitive Research Infrastructure Seed Grants, Rs.25.00 Lakhs)
49. Synthesis and Characterization of Functional Organometallic Polymers (ISIRD, SRIC, IIT-KGP, Rs.5.00 Lakhs)
50. Synthesis and Characterization of Main-Chain Metal-Containing Conjugated Functional Polymers for Application in Alternative Energy Source (DST, Rs.24.30 Lakhs)
51. Synthesis of Inorganic Fullerene-type MoS<sub>2</sub> and WS<sub>2</sub> Nanoparticles and Study of their Lubrication Properties (ISIRD, IIT Kharagpur, Rs.4.15 Lakhs)
52. Synthetic studies towards small ring macrolides (CSIR, Rs.16.00 Lakhs)
53. Theoretical Modelling of the Role of Hydration in Proton Transfer Processes in Proteins (CSIR, Rs.8.39 Lakhs)
54. Total synthesis of chlorocyclinones PPAR antagonists of natural origin (CSIR, New Delhi, Rs.18.00 Lakhs)
55. Total synthesis of mayamycin, an angucyline C-glycoside (DST, New Delhi, Rs.51.00 Lakhs)
56. Trivalent and divalent lanthanide complexes bearing macro-cyclic ligands for activation of CO<sub>2</sub> and catalyses (DST, Rs.40.00 Lakhs)

#### ***Consultancy Projects***

1. Asymmetric Synthesis of Novel Heterocarbocycles (TCG LifeSciences: Chembiotek, Saltlake, Kolkata, Rs.6.61 Lakhs)

#### ***Patents (filed / granted)***

1. Cardiogreen based antibacterial agent
2. Controlled release of 2,4-D and real time monitoring of morphological changes induced by 2,4-D in plant system
3. Disposable cholesterol biosensor based on redox mediator functionalized graphene oxide nanoarchitecture and the preparation thereof
4. Fluorescent Organic Photoresponsive Nanocarriers for both Tracking and Regulated Release of Pesticide
5. Metal nanoparticle based sensors for hydrogen peroxide, uric acid and cholesterol and the preparation thereof

6. Novel 1, 4-triazole based polyphenol hybrids: First in vitro inhibition of Mycobacterium tuberculosis  $\beta$ -ketoacyl CoA reductase FabG4 (Rv0242c) and growth inhibition of Mycobacterium smegmatis
7. Photoresponsive polymers based on coumarin moiety for the controlled release of pesticide 2,4-D
8. Polyunsaturated fatty acids from animal visera
9. Pyrrole-based Diphosphines and their Oxidized Products
10. Ultra-sensitive simultaneous electrochemical determination of arsenic, mercury and copper

#### Visits Abroad by Faculty Members

1. Chattaraj, Pratim Kumar - Invited speaker (Gyeongju, Korea, ) 11/07/2013 - 13/07/2013
2. Chattaraj, Pratim Kumar - Invited speaker (Les Diablerets, Switzerland, ) 02/06/2013 - 07/06/2013
3. Chattaraj, Pratim Kumar - Invited speaker (Duke University, Durham, North Carolina, United States, ) 05/09/2013 - 07/09/2013
4. Taraphder, Srabani - Invited speaker at conference (Telluride Science Center, Telluride, CO, USA, ) One week
5. Srivastava, Suneel Kumar - Visiting Scientist (Leibniz-Institut für Polymerforschung (IPF), Dresden, Germany, ) 14-05-2013 -16-07-2013

#### Invited Lectures by Faculty Members

1. Exploring biomolecular hydration from simulation studies *by* Bandyopadhyay, Sanjoy (Indian Institute of Technology, Kanpur, India)
2. Molecular simulations of hydrated biomolecules and their complexes *by* Bandyopadhyay, Sanjoy (S. N. Bose National Centre for Basic Sciences, Kolkata, India)
3. Effects of protein structural and energetic heterogeneities on hydration water *by* Bandyopadhyay, Sanjoy (Bhabha Atomic Research Center (BARC), Mumbai, India)
4. Garratt-Braverman Cyclization: a Reaction worth Revisiting *by* Basak, Amit (Viswa Bharati)
5. Asymmetric synthesis of naturally occurring seimatopolide A & B *by* Nanda, Samik (MS University, Vadodara)
6. Garratt-Braverman Cyclization Chemistry and Fluorescence/MALDI Based Study of Molecular Interactions *by* Basak, Amit (NIT Rourkela)
7. Chemistry of Diradicals: Recent Developments *by* Basak, Amit (NIT Durgapur)
8. Diradical Generating Reactions: How Different From the Monoradical Counterpart? *by* Basak, Amit (Women's College, Burdwan Department of Chemistry)
9. Reactive Intermediates in Synthesis and Capture Research: Recent Developments *by* Basak, Amit (IICT Hyderabad)
10. Chiral Diversity Oriented Synthesis of Guaianolides *by* Hajra, Saumen (NOST, Agra)
11. Chiral Diversity in Asymmetric Synthesis of Sesquiterpene Lactones *by* Hajra, Saumen (Centre for Bio-Medical Research (CBMR), Lucknow)
12. Alternative/Hybrid Materials for Visible Light Photocatalysis *by* Rajakumar Ananthakrishnan (North Orissa University, Baripada)
13. Green Strategies for Organic Transformations under Visible Light Conditions *by* Rajakumar Ananthakrishnan (VHNSN College(Autonomous), Virudhunagar, T.N.)
14. Investigations on Functionalized Activated Carbon-Fe<sub>2</sub>O<sub>3</sub> NPs for Enhanced Photodegradation *by* Rajakumar Ananthakrishnan (Department of Inorganic and Analytical Chemistry, Andhra University)
15. Physical Chemistry and Applied Research *by* Dhara, Dibakar (Jadavpur University, Kolkata)
16. Chemical Dynamics in Ionic Liquid containing confined media *by* Sarkar, Nilmoni (NIT Durgapur)
17. Recent advances in material science *by* Pramanik, P (Veer Surendra Sai University of Technology, Burla, Sambalpur Odisha)

18. Synthetic Transition Metal Coordination Chemistry *by* Ray, Debashis (NIT Patna)
19. Synthetic Modifications of D-Fructose *by* Pathak, Tanmaya (Dehradun)
20. Enantiomerically Pure Carbocycles and Heterocycles from Vinyl Sulfone-Modified Carbohydrates *by* Pathak, Tanmaya (IISc, Bangalore)
21. Understanding the Dynamics of Human Carbonic Anhydrase II *by* Taraphder, Srabani (Dynamics of Complex Chemical and Biological Systems, IIT Kanpur)
22. Thermal Unfolding and Functional Dynamics in His-107-Tyr Mutant of Human Carbonic Anhydrase II *by* Taraphder, Srabani (DAE-BRNS Symposium on Current Trends in Theoretical Chemistry, BARC, Mumbai)
23. Dynamics of Conformational Fluctuation and Proton Transfer in HCA II *by* Taraphder, Srabani ("Protein Dynamics Workshop in Telluride, CO, USA)
24. Thermal Unfolding and Proton Transfer in HCA II and its Mutant His-107-Tyr *by* Taraphder, Srabani (5th Indo-American Frontiers of Science Symposium, Agra)
25. Amyloid formation of human serum albumin and lysozyme: effect of Cu(II) and green tea polyphenols *by* Dasgupta, Swagata (Kolkata)
26. Darshan Ranganathan Memorial Lecture Award of Chemical Research Society of India, at CRSI Symposi *by* Dasgupta, Swagata (BHU, Varanasi)
27. Prevention of Cancer – A proven concept *by* Pramanik, P (NIT Rourkela)
28. Surfactants and amphiphilic polymers in nanotechnology - On the way to smarter formulations *by* Pramanik, P (Punjab University, Chandigarh)
29. Advances in Drug Delivery technologies *by* Pramanik, P (Ahmedabad, Gujarat)
30. Materials & Green Chemistry *by* Pramanik, P (NIT Agartala)
31. Nanomaterials and Their Future Promises *by* Pramanik, P (Jadavpur University, Kolkata)
32. Synthesis and Application of Nano sized Inorganic Oxides *by* Pramanik, P (JBNSTS Kolkata)
33. Sustainability impact of experiments in India *by* Pramanik, P (Jadavpur University, Kolkata)
34. Nanomedicine *by* Pramanik, P (Delhi)
35. Promises of Magnetic Nanoparticles in Medicine and Bioscience *by* Pramanik, P (Cuttack, Odisha)
36. Prof. Amarnath Maitra Memorial Seminar *by* Pramanik, P (Delhi University, Delhi)
37. Polymeric Drug Delivery Systems *by* Dey, Joykrishna (S.V. R. M. College, Nagaram, Andhra Pradesh)
38. Synthesis of Value added natural products *by* Nag, Ahindra (University of Bhagalpur, Bihar)
39. Palladium mediated Cascade Reactions *by* Ray, Jayanta Kumar (Kyoto University, Japan)
40. Design, Synthesis and In Vitro Evaluation of PEG Based Amphiphilic Polymers as Nanocarriers for CPT *by* Dey, Joykrishna (Vidyasagar University)
41. Chemistry of Personal Care Products *by* Dey, Joykrishna (University College of Science, Acharya Nagarjuna University, Guntur, Andhra Pradesh)
42. Hueckel Molecular Orbital Theory *by* Ayyappan, Anoop (Hyderabad (IIIT))
43. Introduction to Computational Chemistry *by* Ayyappan, Anoop (Kannur, Kerala)
44. Computational Study of Cyclization reactions *by* Ayyappan, Anoop (Trichy (STCC-FC 2013))
45. Biosensing Applications of Functional Nanoscaffolds Based on Reduced Graphene Oxide *by* Raj, C Retna (15th Asian Chemical Congress, Singapore, Aug. 19-23, 2013)
46. Mechanism of Action of a Microbial Enzyme: A QM/MM and MD study *by* Mishra, Sabyashachi (IIIT Hyderabad (Chemistry with Computers Symposium))
47. Molecules to Medicines: A Chemical Story: *by* Pathak, Tanmaya (Department of Chemistry, St. Xavier's College)
48. Organolithiums in the synthesis of natural products *by* Mal, Dipak Ranjan (ACS-IIT Kharagpur)
49. Benzannulations in total synthesis *by* Mal, Dipak Ranjan (Burdwan University)
50. Lithiation and Hauser annulation in Organic Synthesis *by* Mal, Dipak Ranjan (Gauhati University)
51. Lateral lithiations in synthesis of natural products *by* Mal, Dipak Ranjan (North Bengal University)



52. Hauser annulation for Naphthol synthesis *by* Mal, Dipak Ranjan (Institute of Chemical Technology Mumbai)
53. Anionic annulation in organic synthesis *by* Mal, Dipak Ranjan (IIT Guwahati)
54. Crystal Engineering of New Materials invite talk on “Crystal Engineering of Functional Materials □?” *by* Biradha, Kumar (Singapore)
55. Hydrogen Storage Potential of Some All-Metal and Non-Metal Clusters: A Conceptual DFT Study *by* Chattaraj, Pratim Kumar (Gyeongju, Korea)
56. All-metal Aromaticity and H<sub>2</sub> storage: A Conceptual DFT Study *by* Chattaraj, Pratim Kumar (Les Diablerets, Switzerland)
57. Hydrogen as an Alternative Fuel *by* Chattaraj, Pratim Kumar (DST-INSPIRE SCIENCE CAMP at National Institute of Science & Technology, Berhampur, Orissa)
58. Conceptual Density Functional Theory and Chemical Reactivity *by* Chattaraj, Pratim Kumar (International Institute of Information Technology, Hyderabad, India)
59. All-metal Aromaticity and Hydrogen storage: A Conceptual DFT Approach *by* Chattaraj, Pratim Kumar (Bharathidasan University, Tiruchirappalli, India)
60. Maximum Hardness Principle *by* Chattaraj, Pratim Kumar (Duke University, Durham, North Carolina, United States)
61. All-metal Aromaticity and Conceptual DFT *by* Chattaraj, Pratim Kumar (IIT Bombay, India)
62. Quantum Potential Based Approaches Towards Quantum Dynamics *by* Chattaraj, Pratim Kumar (IIT Kanpur, India)
63. Density Dynamics of Some Quantum Systems *by* Chattaraj, Pratim Kumar (Bhabha Atomic Research Centre (BARC), India)

#### ***Papers Published in Journals***

1. coordination-assisted general approach to nickel- based nano metallogels *By* Santu Dey, Dhruvajyoti Datta, Kaustav Chakraborty, Surajit Nandi, Anakuthil Anoop and Tanmaya Pathak *RSC Advances* 3, 9163 (2013)
2. Fabrication of a ZnO nanocolumnar thin film on a glass slide and its reversible switching from a superhydrophobic to a superhydrophilic state *By* Mondal, Chanchal Ganguly, Mainak Sinha, Arun Kumar Pal, Jaya Pal, Tarasankar *RSC Advances* 3(17), 5937-5944. (2013)
3. Reactivity of conformationally constrained bispropargyl sulfones: complete preference for 6 $\pi$ -electrocyclization process *By* Ghosh, Debaki Jana, Saibal Panja, Arpita Anoop, Anakuthil Basak, Amit *Tetrahedron* 69, 8724-8730 (2013)
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### **Papers Presented in Conferences**

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- on *Colloid and Interface Science (ACCIS 2013)*, University of North Bengal, Darjeeling, (2013)
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  6. Interaction of Cationic Random and Block Copolymers with Anionic Surfactants: Spontaneous Formation of Water-Soluble Nanostructures, By R. Banerjee, D. Dey, S. Dutta, and D. Dhara, *3rd Federation of Asian Polymer Societies Conference and MACRO- 2013*, Indian Institute of Science, Bangalore, (2013)
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  11. Promises of Nanomaterials in Biology, By Panchanan Pramanik, *Nano-Pico Pharmaceuticals and Invivingsome*, Indian Institute of Technology, Delhi, (2012)
  12. Stable Vesicle Formation by Cysteine-Based Zwitterionic Surfactants Bearing mPEG Tail, By R. Ghosh and J. Dey, *5th Asian Conference on Colloid and Interface Science (ACCIS 2013)*, University of North Bengal, Darjeeling, (2013)
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## Department of Civil Engineering

### *Head*

Prof. Subhasish Dey

### *Professors*

Baidya, Dilip Kumar	<i>Ph.D.(IISc Bangalore)</i> , Reliability in Geotechnical Engg Pile foundations Soil Dynamics
Barai, Sudhir Kumar	<i>Ph.D.(IISc Bangalore)</i> , Soft Computing Applications, Structural Health Monitoring, Recycled Construction Materials, Fracture in Concrete
Bhattacharya, Baidurya	<i>Ph.D. (Johns Hopkins Univ)</i> , Computational materials science, Risk and reliability analysis of infrastructure systems
Bhattacharyya, Sriman Kumar	<i>Ph.D.(IIT Kharagpur)</i> ,
Das Gupta, Shambhu Pada	<i>Ph.D.(IIT Kanpur)</i> , constitutive modelling Soil-Structure Interaction Foundation Dynamics
Desai, Venkappayya R	<i>Ph.D.(Clemson Univ)</i> , Integrated watershed/ water management & rainwater harvesting/ best management practices (BMPs), Surface water/ Groundwater Hydrology & combating climate change through Green Infrastructure, Hydraulics & Hydropower Engineering
Dey, Subhasish	<i>Ph.D.(IIT Kharagpur)</i> , Turbulence, Fluvial Hydraulics, Applied Hydrodynamics
Dhang, Nirjhar	<i>Ph.D.(IIT Kharagpur)</i> , Concrete, Dynamics and Control of Railway Bridges, Biomechanics
Ghangrekar, Makarand Madhao	<i>Ph.D (IIT Bombay)</i> , Microbial Fuel Cells, UASB reactor for anaerobic wastewater treatment, Water and Wastewater Treatment, Bioenergy recovery during waste management, Wastewater reuse
Gupta, Ashok Kumar	<i>Ph.D.(IIT Bombay)</i> , Water and Wastewater Treatment, Environmental Impact Assessment, Air Quality Management, Environmental Planning
Maitra, Bhargab	<i>Ph.D.(IIT Bombay)</i> , 1. Transportation Planning, 2. Traffic Operations and Management, 3. Public Transportation System, 4. Travel Behavior Analysis and Demand Models
Maity, Damodar	<i>Ph.D.(IIT Kharagpur)</i> , Seismic Analysis of Dam, Health Monitoring of Structures, Cost Effective Housing
Ramachandra, Lingadahally	<i>Ph.D.(IIT Chennai)</i> , Stability of Structures, Nonlinear Vibrations, Shell analysis
Reddy, Kusam Sudhakar	<i>Ph.D.(IIT Kharagpur)</i> , Pavement analysis, Pavement Design, Pavement Evaluation, Pavement Materials
Roy, Debasis	<i>Ph.D(Univ.of British Colo)</i> , Geotechnical Earthquake Engineering, Ground Improvement, Insitu testing of Geomaterials
Sen Gupta, Aniruddha	<i>Ph.D.(Illinois Univ)</i> , Geotechnical Earthquake Engineering, Landslide Hazard Mitigation, Mechanics of Materials, Soil-Structure Interaction
Sen, Dhruvajyoti	<i>Ph.D.(IIT Delhi)</i> , Water resources engineering, Numerical techniques

in civil engineering hydraulics

**Associate Professors**

- Dash, Sujit Kumar *Ph.D.(IIT Madras)*, Reinforced soil structures, Shallow foundation
- Deb, Arghya *Ph.D.(Princeton Univ)*, Failure and Debonding in concrete, Impact loading on concrete structures, Discrete Element Modelling
- Deb, Kousik *Ph.D.(IIT, Kanpur)*, Soil-Structure Interaction, Ground Improvement, Geosynthetic-Reinforced Earth, Numerical Modeling, Soil Arching, Foundation/Embankment on Soft Soil, Geotechnical Earthquake Engineering, Dynamic Analysis of Rigid Pavement
- Goel, Sudha *Ph.D.(Johns Hopkins Univ)*, Environmental Impact and Risk Assessment, Water Quality and Treatment, Solid and Hazardous Waste Management, Environmental Engineering
- Pal, Anjali *Ph.D (Calcutta Univ.)*, Nanoparticle mediated wastewater treatment, Photocatalytic degradation of organic pollutants, Arsenic remediation in groundwater, Adsorption / adsolubilization for wastewater management
- Reddy, M Amaranatha *Ph.D.(IIT Kharagpur)*, Transportation Engineering

**Assistant Professors**

- Banerjee, Biswanath *Ph.D.(IISc., Bangalore)*, Computational Mechanics, Inverse Problems
- Bhattacharya, Paramita *Ph.D.(IISc. Bangalore)*, Computational Geotechnical Engineering, Soil Stabilization, Seismic Analysis of Underground Structures
- Biligiri, Krishna Prapoorna *Ph.D.(Arizona St. Univ. USA)*, Pavement Design & Analysis, Sustainable Materials in Highways & Environment, Advanced Pavement Materials Characterization, Transportation-Related Noise Evaluation & Modeling, Statistical Applications in Transportation Engineering & Constitutive Modeling, Pavement Performance & Management, Impact of Alternative Materials on Climate Change
- Chakraborty, Debarghya *Ph.D.(IISc Bangalore)*, Soil Dynamics, Computational Geomechanics, Reinforced Soil Structures, Geotechnical Earthquake Engineering
- Chakraborty, Sushanta *Ph.D.(IIT Kharagpur)*, Vibration Serviceability of Building Floors using Experimental Modal Testing, Finite Element Model Updating and its application to FRP structures
- Dhar, Anirban *Ph.D.(IIT, Kanpur)*, Groundwater Contamination and Remediation, Water Resources Systems Analysis, Environmental Fluid Mechanics, Computational Hydraulics, Applied Optimization Theory, Geostatistics
- Hossain, Shaikh Jahangir *Ph.D.(IIT Kharagpur)*, computational mechanics, Finite Element Method, Nonlinear Mechanics
- Maity, Rajib *Ph.D.(IISc. Bangalore)*, Hydroclimatology, Water Resources Engineering, Stochastic Hydrology, Watershed Development, Soft

Computing in Hydrology, Monsoon rainfall

Mitra, Nilanjan

*Ph.D.(UW, SEATTLE)*, Earthquake loading of structures, Fluid Structure Interaction, Probabilistic modeling, Physics and Mechanics of solids and fluids, High strain rate loading (shock waves and impact loading), Reinforced concrete and composite structures, Molecular dynamic simulations of shock loading of materials, Continuum Mechanics of defects in materials

Mitra, Sudeshna

*Ph.D.(ASU, Phoenix)*, Transportation Safety, Crash Data Analysis and Modelling, Statistical and Econometric Modelling of Transport data, Sustainable Transportation Planning, Traffic Engineering and Operations in heterogenous traffic

Reddy, Hanmaiahgari Prashanth

*Ph.D.(IIT Madras)*, experimental and numerical modeling of steady and unsteady flows in pipelines and open channels, experimental studies on turbulence characteristics of flows in open channels and pipelines, sediment transport in rivers- river morphology- reservoir sedimentation, pipeline engineering - water distribution networks - leaks and blockages in liquid pipelines, unsteady flows in hydropower stations

Shaws, Amit

*Ph.D.(IISc Bangalore)*, Computational Mechanics, Ballistic Response of Nano-Composite Armour, Impact Mechanics, Underwater blast

Verma, Shubha

*Ph.D.(IIT Bombay)*, Environmental Engineering, Air Pollution, Aerosol Modelling and Climate Impacts

### ***Faculty Re-employment***

Prof. S. P. Dasgupta

Professor

### ***New Academic Programmes***

M.Tech. (Construction Technology and Management) in collaboration with L&T

### ***Brief Description of on-going activities***

EnvE: Microbial Fuel Cells: Application for wastewater treatment and energy recovery, Onsite treatment of domestic sewage from small community, Studies on granulation in UASB reactor treating low strength wastewater to enhance efficiency of the reactor, Water quality and health assessment, Biological treatment of solid waste, Factors affecting the use of chlorine in water supply systems; Nanoparticle synthesis, their characterization and application; Photodegradation of organic pollutants; Adsorbilization/adsorption; Monitoring and modelling of tropospheric solid state polydisperse aerosols and ozone and assessment of pulmonary deposition in Kolkata urban region; Monitoring and modelling of ambient air quality in residential, commercial and industrial regions of Kolkata; Removal of Fluoride from ground water using low cost adsorbents; Removal of Arsenic from ground water using low cost adsorbent; Photocatalytic degradation of dye containing effluents using Ag+ doped TiO<sub>2</sub>.

SE: Recycled construction materials, Stability of plates and shells, Biomechanics, Reliability of bridge structures, Low cost housing, Seismic analysis of dams, Fluid-structure Interactions, Structural Health Monitoring, Finite Element Model updating

TE: Cell filled low cost rural roads, Analysis and Evaluation of Concrete and flexible pavements, Specifications for bituminous mixes and Urban transportation planning.

HWRE: Investigations of effect of lateral flow on turbulent submerged jets, Study of coherent turbulent structure over gravel beds and bed-forms, development and comparative study of flood inundation models, drought characterization and forecasting, development and comparison of different models for flood forecasting.

GTE: Erosion control and mechanical stabilization of soils using natural fibers, ground improvement, soil-microbe interaction, insitu testing, geotechnical earthquake engineering, landslides and slope stabilisation

### ***Thrust Areas***

1. EnE: Water and Wastewater treatment, Solid Waste Engineering, Environmental Microbiology, Environmental Impact Assessment, Air Pollution Modeling, Bio-energy
2. SE: Reliability engineering, nonlinear mechanics, structural health monitoring, fluid-structure interaction.
3. HWRE: Submerged Jets, Coherent Turbulent Structure, Sediment Transport and Scour, Numerical Study of Surface Flow, Hydrological Model.
4. TE: Pavement Design, Traffic Planning and Design, Low-cost Road Construction.
5. GTE: Geotechnical earthquake engineering, slope stability, ground improvement, microbe-soil interaction, static and cyclic soil-structure interaction and foundation strengthening of monumental structures.

### ***New Acquisitions***

1. Seismic piezocone
2. In situ testing vehicle
3. MASW system for shear wave velocity profiling
4. Resonant column for small strain dynamic testing system for soil
5. Digital direct shear apparatus for soil testing
6. Carry Eclipse Fluorescence Spectrophotometer
7. GC, Autolab potentiostat/Galvanostat; Online water quality analyzer, etc.
8. Shaker table for earthquake simulation

### ***International Collaborations***

Dr. Rajib Maity: University of New South Wales, Australia; Purdue University, USA

Domenico Ferraro, a PhD student of University of Calabria, Italy visits Department of Civil Engineering for two months during Summer vacation.

### ***Lectures by Visiting Experts***

1. Modelling of Fluvial Processes by Prof. Takashi Hosoda (Kyoto University)

### ***Doctoral and MS Degrees Awarded***

1. Ashim Kr. Mishra : Estimation of Material Properties of Fiber Reinforced Plastics Composite Plates using Mixed Numerical-Experimental Technique(Ph.D.)
2. Bharadwaj Nanda : Nonlinear response of pile foundation under vertical and coupled vibration: an experimental and numerical investigation(Ph.D.)



3. Debjit Bhowmik : Vibration based structural damage assessment using unified particle swarm optimization(Ph.D.)

***Member - Professional Bodies***

1. Pal, Anjali, *Life Member* - Chemical Research Society of India
2. Pal, Anjali, *Member* - Materials Research Society of India
3. Pal, Anjali, *Life Member* - Indian Society for Radiation and Photochemical Sciences
4. Pal, Anjali, *Life Member* - Indian Society for Surface Science and Technology
5. Maitra, Bhargab, *Chair* - Chair, SIG D3 (Econometric/Statistical Travel Demand Models), World Conference on Transportation Research Society (WCTRS), 2013–16
6. Maitra, Bhargab, *Member* - Member, Scientific Committee, World Conference on Transportation Research Society (WCTRS), 2013–16
7. Roy, Debasis, *Member* - Canadian Geotechnical Society
8. Roy, Debasis, *Associate Member* - American Society of Civil Engineers
9. Roy, Debasis, *Life Member* - India Geotechnical Society
10. Roy, Debasis, *Associate Member* - Earthquake Engineering Research Institute
11. Roy, Debasis, *Regular* - Bureau of Indian Standards, Committee 39-10
12. Goel, Sudha, *Honorary Secretary*, Kharagpur Local Centre - Institution of Engineers (India)
13. Goel, Sudha, *Member* - Institution of Engineers (India)
14. Goel, Sudha, *Senior Member* - APCBEES
15. Goel, Sudha, *REGULAR* - MEMBER, AMERICAN WATER WORKS ASSOCIATION
16. Ghangrekar, Makarand Madhao, *Life Member* - Indian Association for Environmental Management
17. Ghangrekar, Makarand Madhao, *Life Member* - Institution of Engineers (India)
18. Ghangrekar, Makarand Madhao, *Life Member* - Indian Society for Technical Education
19. Ghangrekar, Makarand Madhao, *Member* - International Water Association
20. Reddy, M Amaranatha, *Life Member* - Indian Roads Congress
21. Reddy, M Amaranatha, *Annual member* - Association of Asphalt Pavement Technologies
22. Bhattacharya, Baidurya, *Member* - American Society of Civil Engineers
23. Bhattacharya, Baidurya, *Special Invitee* - National Disaster Management Authority, Steering Committee on Geophysical Hazard and Working Committee of Experts on Vulnerability Analysis and Risk Assessment
24. Bhattacharya, Baidurya, *Member* - International Association for Structural Safety and Reliability (IASSAR), Subcommittee on Structural Reliability and Optimization (SC3)
25. Maity, Damodar, *Member* - Indian Buildings Congress
26. Maity, Damodar, *Member* - Indian Society for Technical Education
27. Maity, Damodar, *Member* - Indian Association for Computational Mechanics
28. Verma, Shubha, *Organizational Committee India Working Group* - International Global Atmospheric Chemistry (IGAC)
29. Verma, Shubha, *Member* - American Geophysical Union
30. Verma, Shubha, *Member* - Indian Aerosol Science and Technology Association
31. Maity, Rajib, *Life Member* - Indian Society for Hydraulics (ISH), India
32. Maity, Rajib, *Member* - European Geosciences Union (EGU), Germany
33. Maity, Rajib, *Member* - American Geophysical Union (AGU), USA
34. Maity, Rajib, *Member* - International Water Resources Association (IWRA), France
35. Maity, Rajib, *Member* - International Association of Hydrological Sciences (IAHS), UK
36. Maity, Rajib, *Life Member* - The Indian Science Congress Association (ISCA), India
37. Deb, Kousik, *Member* - International Society for Soil Mechanics and Foundation Engineering
38. Deb, Kousik, *Life Member* - Indian Geotechnical Society
39. Mitra, Sudeshna, *Associate Member* - Transportation Research Board
40. Mitra, Sudeshna, *Life Member* - Transportation Research Group of India
41. Mitra, Sudeshna, *Member* - SIG-15 Committee of World Conference on Transport Research Society

42. Mitra, Nilanjan, *Associate* - American Concrete Institute
43. Dhar, Anirban, *Life Member* - Indian Society for Hydraulics (ISH)
44. Dhar, Anirban, *Life Member* - Indian Association of Hydrologists
45. Dhar, Anirban, *Life Member* - The Indian Science Congress Association (ISCA)
46. Dhar, Anirban, *Member* - International Association of Hydrological Sciences (IAHS)
47. Dhar, Anirban, *Member* - International Association of Hydrogeologists (IAH)
48. Dhar, Anirban, *Member* - International Association for Hydro-Environment Engineering and Research (IAHR)
49. Reddy, Hanmaiahgari Prashanth, *member* - International Association of Hydraulic Research (IAHR)
50. Reddy, Hanmaiahgari Prashanth, *member* - American Society of Civil Engineers (ASCE)
51. Biligiri, Krishna Prapoorna, *Member* - American Society for Testing & Materials (ASTM) International
52. Biligiri, Krishna Prapoorna, *Member Affiliate* - Rubber Pavements Association, Arizona, United States of America
53. Biligiri, Krishna Prapoorna, *Young Member* - Transportation Research Board of the US National Academies of Engineering
54. Baidya, Dilip Kumar, *Regular* - Member, Int Soc for Soil Mechanics and Geotechnical Engineering
55. Baidya, Dilip Kumar, *Life* - Member, Indian Geotechnical Society
56. Baidya, Dilip Kumar, *Life* - Indian society for Rock Mechanics and Tunelling Technology
57. Barai, Sudhir Kumar, *Member* - International Association of Engineers (IAENG)
58. Barai, Sudhir Kumar, *Life Member* - Indian Society for Construction Material and Structures (ISCMS)
59. Barai, Sudhir Kumar, *Life Member* - Indian Roads Congress (IRC)
60. Barai, Sudhir Kumar, *Member* - International Association for Life-Cycle Civil Engineering (IALCCE)
61. Barai, Sudhir Kumar, *Life Member* - Institute of Smart Structures and Systems (ISSS)
62. Barai, Sudhir Kumar, *Life Member* - Indian Association for Structural Engineering (IASE)
63. Barai, Sudhir Kumar, *Member* - International Association for Bridge Maintenance and Safety (IABMS)
64. Barai, Sudhir Kumar, *Senior Member* - RILEM
65. Barai, Sudhir Kumar, *Professional Member* - Association for Computing Machinery (ACM)
66. Barai, Sudhir Kumar, *Life Member* - Indian Association for Computational Mechanics (IACM)
67. Barai, Sudhir Kumar, *Member* - Young Researchers Committee, World Federation for Soft Computing (WFSC)
68. Barai, Sudhir Kumar, *Life Member* - Indian Concrete Institute (ICI), Chennai
69. Barai, Sudhir Kumar, *Life Member* - The Indian Society for Technical Education (ISTE)
70. Barai, Sudhir Kumar, *Life Member* - The Indian Science Congress Association (ISCA)
71. Barai, Sudhir Kumar, *Life Member* - American Society for Civil Engineers India Section (ASCE IS)
72. Barai, Sudhir Kumar, *Associate Member* - The International Society of Structure and Multidisciplinary Optimization (ISSMO)
73. Sen, Dhruvajyoti, *Regular* - International Association of Hydraulic Research
74. Sen, Dhruvajyoti, *Regular* - Indian Society of Hydraulics
75. Sen Gupta, Aniruddha, *Associate Member* - American Society of Civil Engineers
76. Sen Gupta, Aniruddha, *Member* - Sigma Xi - The Scientific Research Society
77. Sen Gupta, Aniruddha, *Member* - Chi Epsilon - Civil Engineering Honor Society

***Member - Editorial Board***

1. Barai, Sudhir Kumar (2012) *Member* - Advances in Concrete Construction

2. Barai, Sudhir Kumar (2013) *Regional Editor* - Journal of Building Construction and Planning Research
3. Barai, Sudhir Kumar (2013) *Member* - The Scientific World Journal - Civil Engineering
4. Barai, Sudhir Kumar (2013) *Member* - IST Transactions of Civil Engineering and Construction Management (CECM)
5. Barai, Sudhir Kumar (2007) *Member* - International Journal of Multimedia and Ubiquitous Engineering
6. Barai, Sudhir Kumar (2009) *Member* - Journal of Information Technology in Construction
7. Barai, Sudhir Kumar (2013) *Associate Editor* - Sadhana
8. Bhattacharya, Baidurya (2014) *Associate Editor* - Journal of Bridge Engineering
9. Biligiri, Krishna Prapoorna (2014) *Editorial Board Member* - Journal of Testing and Evaluation, American Society for Testing and Materials International, USA
10. Biligiri, Krishna Prapoorna (2014) *Associate Editor* - Trends in Transport Engineering and Applications
11. Deb, Kousik (2013) *Editorial Board Member* - The Scientific World Journal: Civil Engineering
12. Desai, Venkappayya R (2013) *Reviewer* - Jrnl of Hydrometeorology
13. Desai, Venkappayya R (2013) *Reviewer* - Sadhana -Academic proceedings in Engineering Science
14. Desai, Venkappayya R (2014) *Reviewer* - Current Science
15. Desai, Venkappayya R (2014) *Reviewer* - Natural Hazards Journal
16. Desai, Venkappayya R (2009) *Reviewer* - Jrnl of Irrigation and Drainage
17. Dey, Subhasish (2011) *Associate Editor* - International Journal of Sediment Research
18. Dey, Subhasish (2013) *Associate Editor* - Journal of Hydraulic Research
19. Dey, Subhasish (2011) *Associate Editor* - Journal of Numerical Mathematics and Stochastics
20. Dey, Subhasish (2011) *Associate Editor* - Acta Geophysica
21. Dey, Subhasish (2011) *Member of Editorial Board* - International Review of Civil Engineering
22. Dey, Subhasish (2011) *Associate Editor* - Journal of Hydraulic Engineering
23. Dey, Subhasish (2011) *Member of Editorial Board* - Flow Measurement and Instrumentation
24. Dey, Subhasish (2011) *Associate Editor* - Sedimentology
25. Dey, Subhasish (2011) *Member of Editorial Board* - Engineering Applications of Computational Fluid Mechanics
26. Dey, Subhasish (2011) *Associate Editor* - Journal of Hydro-Environment Research
27. Ghangrekar, Makarand Madhao (2009) *Editorial Board member* - International Journal of Wastewater Treatment and Green Chemistry (IJWTGC)
28. Ghangrekar, Makarand Madhao (2009) *Associate Editor* - Renewable and Sustainable Energy (RSE)
29. Ghangrekar, Makarand Madhao (2009) *Editorial Advisory Board Member* - Chemical Bulletin, Romania, series of Chemical and Environmental Engineering
30. Maitra, Bhargab (2012) *Co-Editor* - Journal of Transport Literature
31. Maity, Damodar (0) *Member of the Editorial Board* - Journal of Computational Engineering
32. Maity, Rajib (2009) *Associate Editor* - Journal of Civil, Environmental, and Architectural Engineering
33. Maity, Rajib (2014) *Associate Editor* - ISH Journal of Hydraulic Engineering, Taylor and Francis
34. Pal, Anjali (2008) *Co-Editor* - Research Journal of Chemistry and Environment
35. Pal, Anjali (2007) *Editorial Advisory Board* - Recent Patents on Nanotechnology
36. Roy, Debasis (2010) *Associate Editor* - Geomechanics and Engineering
37. Roy, Debasis (2010) *Associate Editor* - IST Transaction of Civil Engineering and Construction Management
38. Roy, Debasis (2013) *Editorial Panel Member* - Environmental Geotechnics
39. Sen Gupta, Aniruddha (2013) *Editor* - Intl J. of Geotechnical Engineering (JoGE)
40. Sen Gupta, Aniruddha (2012) *Member of Editorial Board* - International J. of Applied Engineering & Technology

41. Sen, Dhruvajyoti (2006) *Associate Editor* - Australian Journal of Water Resources

### **Awards & Honours**

1. Ghangrekar, Makarand Madhao (2013) *Alexander von Humboldt Fellowship*
2. Gupta, Ashok Kumar (2012) *Awarded the Shiksha Rattan Puraskar, award by the IIFS, New Delhi*
3. Mitra, Nilanjan (2012) *DAAD Research Stay Fellowship*
4. Mitra, Sudeshna (2013) *DAAD-IIT Faculty Exchange Fellowship*
5. Maity, Rajib (2012) *Emerging Leaders Fellowship by Australia India Institute at the University of Melbourne, Australia*
6. Deb, Kousik (2012) *Fast Track Project Grant for Young Scientists - 2012 from Science and Engineering Research Council (SERC), Department of Science and Technology (DST), India*
7. Deb, Kousik (2012) *IIT Roorkee Shamsheer Prakash Research Award 2012 for Outstanding Research Contribution in Geotechnical Engineering by Young Indian Researcher below 45 years age, IITRoorkee Through SP Foundation, USA*
8. Shaws, Amit (2012) *Outstanding Young Faculty Award, IIT Kharagpur*
9. Chakraborty, Debarghya (2014) *Prof. N. S. Govinda Rao Gold Medal for the academic year 2012-2013 by the Council of the Indian Institute of Science (IISc) Bangalore for the Best Ph.D Thesis in the Department of Civil Engineering*
10. Maity, Rajib (2012) *Prof. R. J. Grade Research Award by the Executive Council of Indian Society for Hydraulics for the year 2012*
11. Mitra, Nilanjan (2013) *Raman Fellowship*
12. Mitra, Sudeshna (2013) *Raman Fellowship*
13. Maity, Rajib (2012) *Selected as ASCE 2011 Outstanding Reviewer by the Editor of Journal of Hydrologic Engineering, American Society of Civil Engineers (ACSE)*
14. Biligiri, Krishna Prapoorna (2013) *Who's Who in America*
15. Biligiri, Krishna Prapoorna (2014) *Who's Who in Engineering Higher Education*

### **Sponsored Research Projects**

1. A creative economic & urban redesign based pilot project of Gariahat Area (In Association with Kolkata Museum of modern arts) (MHRD, Govt. of India, Rs.100.00 Lakhs)
2. Advanced Research Laboratory on Safety and Uncertainty Analyses of Infrastructure Systems (BARC, Mumbai, Rs.150.00 Lakhs)
3. Aerosol Chemical and Optical characteristics over an urban coastal city in the Ganges Delta (SRIC, Rs.3.00 Lakhs)
4. Application of geocell reinforcement for performance improvement of anchored foundations under uplift (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
5. Arresting delamination propagation of sandwich composite panels with initial face/core debond subjected to inplane compression load (SRIC-ISIRD, Rs.5.00 Lakhs)
6. Artificial intelligence for societal needs: knowledge discovery and intelligent decision making for solving problems in Indian context related to ener (MHRD, Govt. of India, Rs.500.00 Lakhs)
7. Assessing the current & future creative economic regeneration scope of traditional river - based heritage & eco-tourism networks in KMA, Bengal (MHRD, Govt. of India, Rs.50.00 Lakhs)
8. Assessment of Various Strategies of Seating Arrangements for Indian Rail Coaches from the view point of Occupant's Safety (RDSO through Center for Railway Research, Rs.29.52 Lakhs)
9. Attribution of inter-seasonal aerosol radiative effects of climate to aerosol constituents and emission sources: Integration of Measurements and Model (DST, Rs.0.00 Lakhs)
10. Award of Fellowship under national renewable fellowships (Ministry of New and Renewable Energy, Govt. of India, Rs.61.76 Lakhs)

11. Bridge scour estimation, measurement and protection and use of various time systems like TDR, TTS and SA (RDSO, Rs.152.00 Lakhs)
12. Bridge scour measurement and protection and use of various real time monitoring systems like TDR, TTS, SMC & SA (RDSO Lucknow, Rs.165.00 Lakhs)
13. Characterization of Ballistic Performance of Ceramic-Metal Composite Armour against Armour Piercing (AP) Projectile (SRIC, Rs.5.00 Lakhs)
14. Creep and warping (including gauge widening) analysis of hot running loco wheels towards development of design guidelines against gauge widening (RDSO, Rs.49.79 Lakhs)
15. Damage assessment of aircraft structures from limited vibration data (Aeronautical Research & Development Board, Rs.8.45 Lakhs)
16. Damage assessment of composite structures using swarm based optimization technique from changes of vibration response (Vikram Sarabhai Space Centre, ISRO, Rs.27.56 Lakhs)
17. Determination of leishmanicidal potential of metal nanoparticles and their conjugates (Calcutta University, Rs.2.00 Lakhs)
18. Developing a Suitable Methodology for Identifying Accident Prone Sites in the Presence of Limited Data (ISIRD, IIT Kharagpur, Rs.5.00 Lakhs)
19. Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-Learning (MHRD, Rs.8.00 Lakhs)
20. Development & Dissemination of Appropriate Tech. for Small Scale Grain Storage for Value Addition, Improving Marketability & Income of Farm Families (Department of Agriculture MW & C Branch, Government of West Bengal Marketing, Rs.40.00 Lakhs)
21. Development of a web course on Probability methods for Civil Engineering (Ministry of Human Resource Development (MHRD), Government of India, Rs.5.00 Lakhs)
22. Development of Crack Propagation Criteria for Asphalt Mixtures (Institute Scheme for Innovative Research and Development (ISIRD), IIT Kharagpur, Rs.0.00 Lakhs)
23. Development of Design Methodology for Chemically Treated Bamboo Reinforced Concrete members for Low Cost Housing (BMTPC, GOI, Rs.16.80 Lakhs)
24. Development of durable water repellent jute geotextile (Jute Manufacturers Development Council, Rs.168.72 Lakhs)
25. Development of e-courses for B.Tech. (Agricultural Engineering) Degree Programme, Soil Mechanics (National Agricultural Innovation Project (NAIP), Rs.0.50 Lakhs)
26. Development of Microbial Fuel Cell for Direct Electricity Recovery During Wastewater Treatment (DST, New Delhi, Rs.61.10 Lakhs)
27. Development of Pervious Concrete Mix Designs and Specifications for Pavement Applications (Ministry of Human Resource Development, Government of India, Rs.0.00 Lakhs)
28. Development of Provisions for Design of Steel Concrete Railway Bridge for normal speed and special provision for high speed passenger traffic (RDSO, Rs.118.95 Lakhs)
29. Development of railway bridge health monitoring system with wireless sensor network (Ministry of Railways, RDSO, Lucknow, Rs.187.02 Lakhs)
30. Effects of Fines on Behavior of Geosynthetic-Reinforced Sands (Indian Institute of Technology Kharagpur, Rs.5.00 Lakhs)
31. Efficiency Study of Damodar Left Bank Irrigation System and Strategies for Integrated Command Area Water Management (MoWR, INDIA, Rs.46.00 Lakhs)
32. Electrocoagulation in continuous-flow systems for removal of drinking water contaminants (DST-WTI, Rs.35.90 Lakhs)
33. Energy efficiency, community based water and waste water treatment systems for development in India (DST, New Delhi, Rs.17.50 Lakhs)
34. Experimental and Numerical Studies on Deep Excavation under Static and Seismic Conditions (Department of Science and Technology, SERB, India, Rs.73.00 Lakhs)
35. Experimental and Numerical Studies on Stone Column-Supported Embankments Resting on Soft Soil (Department of Science and Technology, SERB, India, Rs.18.90 Lakhs)
36. Experimental modelling of flow characteristics in and around emergent vegetation patches (SRIC, Rs.28.00 Lakhs)
37. Future of Cities (MHRD, Govt. of India, Rs.2500.00 Lakhs)

38. Ganga River Basin - Environment Management Plan (MoEF, Rs.10.00 Lakhs)
39. Ganga River Basin Environmental Management Plan (Ministry of Environment and Forest, New Delhi., Rs.30.00 Lakhs)
40. GANGA RIVER BASIN MANAGEMENT PLAN (MoEF, New Delhi, Rs.25.00 Lakhs)
41. Guidelines for Bicycle Infrastructure Design and Policy (HSMI, HUDCO, Rs.17.20 Lakhs)
42. HYDRODRIL (WP5) (European Union (Prof. Wei Wu, Coordinator), Rs.34.00 Lakhs)
43. Hydrologic sensitivity to Cryosphere-Aerosol interaction in Mountain Processes (DST, India; RCN, Norway, Rs.0.00 Lakhs)
44. Improving mechanical performance and delamination resistance in sandwich composite panels (Department of Science and Technology (DST/SERC), India, Rs.25.00 Lakhs)
45. Investigation of the Use of Recycled Asphalt Pavements (RAP): Development of Design Specifications and Practices (Ministry of Human Resource Development, Government of India, Rs.0.00 Lakhs)
46. Managing change in Soil Moisture and Agricultural Productivity under a Global Warming scenario using a Catchment Scale Climate Change Assessment Frame (Australia-India Strategic Research Funds (AISRF), Rs.33.00 Lakhs)
47. Mathematical and Physical Modeling of Arsenic Transport Through Porous Media (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
48. NPTEL Phase II, Video Course Development on Advanced Foundation Engineering (Ministry of Human Resource Development (MHRD), Govt. of India, Rs.2.50 Lakhs)
49. Optimization of rib pattern in steel rebars to achieve enhanced fatigue life and good bond strength (Tata Steel, Rs.10.65 Lakhs)
50. P K Sinha Centre Project (Dr. Prabhakant Sinha for enhancing research activities on Bioenergy., Rs.0.00 Lakhs)
51. Pilot Phase of the National Mission Project on Pedagogic Development for the course Hydraulics (National Mission Project on Education through ICT, Ministry of Human Resource Development, GOI, Rs.0.00 Lakhs)
52. Pilot Phase of the National Mission Project on Pedagogic Development for the course 'Solid Mechanics' (National Mission Project on Education through ICT, MHRD, Govt. of India, Rs.0.00 Lakhs)
53. Preparation of Ganga River Basin Management Plan (National River Conservation Directorate, MOEF, INDIA, Rs.0.00 Lakhs)
54. Probabilistic estimation of soil moisture from RISAT1 data along with uncertainty quantification (SAC, ISRO, Ahmedabad, Rs.19.92 Lakhs)
55. Probabilistic simulation and future estimation of soil moisture distribution over India using Hydroclimatic data (ISIRD, IIT Kharagpur, Rs.5.00 Lakhs)
56. Production of Lignocellulosic Fuels: from Lab to Pilot Scale (PLF) (DBT, Rs.345.84 Lakhs)
57. Seismic hazard assessment, microzonation, and evaluation of vulnerability, risk and socio-economic impacts for the city of Kolkata (Ministry of Earth Sciences, Government of India, Rs.432.71 Lakhs)
58. Sensor network and web-enablement for geospatial technology based tools development and disaster management: a pilot study (Department of Science and Technology, Rs.24.80 Lakhs)
59. Smarter water resources management, Disaster Mitigation & Diabetic Retinopathy (WDD) (IBM India Private Limited, Rs.24.00 Lakhs)
60. Strengthening the Research & Postgraduate Teaching in the Areas of Structural, Geotechnical, Environmental & Transportation Engg. (Department of Science and Technology, New Delhi, Rs.245.00 Lakhs)
61. Submicron aerosols in east India: sources, chemical characteristics, climate impacts (DST, Rs.14.00 Lakhs)
62. Supporting consolidation, replication and up-scaling of sustainable wastewater treatment and reuse technologies for India (SARASWATI). (DST, New Delhi, Rs.81.32 Lakhs)
63. Synthesis and characterization of mono and bimetallic nanoparticles on supported systems and their application for the degradation of organic pollutant (IIT Kharagpur (under ISIRD), Rs.5.00 Lakhs)

64. Theoretical and Experimental Investigations on the Stability and Chaotic Behavior of Non-Smooth Flexible, Curved and Twisted Pipe subjected to Followe (IIT- Kharagpur (ISIRD-SRIC Scheme), Rs.1.00 Lakhs)
65. Trip Makers' Perception towards Hard and Soft Factors of Bus Service and the Impact of these Factors on Bus Ridership in Urban areas ( Human Settlement Management Institute, HUDCO, Govt. of India, Rs.22.05 Lakhs)
66. Underwater Ballistic Response of Marine Grade Sandwich Composite Panels (Naval Research Board, INDIA, Rs.0.00 Lakhs)
67. Underwater non-contact explosive response of marine grade sandwich composite panels (EMS) (NRB/DRDO, Rs.72.48 Lakhs)
68. Upgradation of laboratory and library facilities for renewable energy programme (ULR) (Ministry of New and Renuable Energy, Govt. of India., Rs.50.00 Lakhs)
69. Urban - design, planning & urban engineering exploration of Varanasi (MHRD, Govt. of India, Rs.150.00 Lakhs)
70. Virtual Lab - Soft Computing Tools in Engineering (MHRD, New Delhi, Rs.42.90 Lakhs)

### ***Consultancy Projects***

1. Advice on Pavement Design for SH-15 in West Bengal (ADSW) (BPC India, Jadavpur, Kolkata, India, Rs.0.50 Lakhs)
2. Advice- L&T ECC diviison Chennai (L&T ECC diviison Chennai, Rs.1.37 Lakhs)
3. Assesment of Structural Soundness of Magazine Building A1-18 at Balasore (DRDO, Rs.0.00 Lakhs)
4. Assessment of static design of Dobra-Chanti bridge (PWD Dehradoon, Rs.78.00 Lakhs)
5. Bituminous Mix Design for NH-54 in the state of Assm (M/s Punjlloyd Ltd, Assam, Rs.0.56 Lakhs)
6. Calibration of Bump Integrator (CBMP) (Hindustan Construction Company Limited, District Malda, West Bengal, India, Rs.0.67 Lakhs)
7. Characterisation of different normal, modified bitumen and emulsions of SHELL (M/s Shell India Markets Pvt Ltd, Guragon, Rs.5.51 Lakhs)
8. Consultancy by IIT-KGP for compliance of FC & EC Conditions of Manoharpur Iron Ore Mines, Chiria, Jharkhand (steel Authority of India Ltd. (SAIL), Rs.11.60 Lakhs)
9. Design of DBM with Reclaimed Asphalt (DDRA) (Chetak Enterprises Limited, Robertsganj, District Sonebhadra, Uttarpradesh, India, Rs.1.68 Lakhs)
10. Development of Effluent treatment plant for Rice mills (Qualicom solutions Pvt. Ltd. Bhubaneswar, Rs.2.00 Lakhs)
11. Development of provisions for design of steel concrete railway bridge for normal speed and special provision for high speed passenger traffic (RDSO, Rs.118.95 Lakhs)
12. Development plan preparation for Korba urban area, Chhattisgarh, (The Director, Directorate of Town & Country Planning, R.D.A., Rs.29.91 Lakhs)
13. Evalaution of normal, modified and bituminous emulsion (Various govt and private agencies, Rs.3.08 Lakhs)
14. Evaluation of elastic modulus and complex modulus of CRMB binder (M/s Gammon India Pvt Ltd, Muzzaffarpur, Rs.0.55 Lakhs)
15. Evaluation of Modulus of Elasticity of Rail Track Formation (HMBS Textiles Pvt Ltd. Delhi, Rs.7.00 Lakhs)
16. EVALUATION OF MODULUS OF SUBGRADE REACTION OF RAIL TRACK FORMATION (MRRT) (HMBS Textiles, Rs.0.00 Lakhs)
17. Evaluation of Subgrade soils using Stabilig soil modifier (M/s Satbilig Road Solutions Pvt Ltd, Gurgaon, Rs.1.69 Lakhs)
18. Health Assessment of New LD Gas Holder at Tata Steel, Jamshedpur (TATA STEEL Ltd., Jamshedpur, Rs.5.61 Lakhs)
19. Inspection of hollow box segmental cantilever pre-stressed bridge over river Kata Khali at Hasnabad (Gopvernment of West Bengal, Rs.0.00 Lakhs)

20. Inspection of Knatakhali river bridge well and pier cap connection integrity and recommendation of rehabilitaiton plan (Public Works (Road) department, Government of West Bengal, Rs.5.60 Lakhs)
21. → Checking design and drawing of UASB type sewage treatment plant (CDST) (Apporv Air Control, Jaipur, Rs.3.25 Lakhs)
22. Mathematical model study for Ghatal Master Plan (WAPCOS, Rs.22.00 Lakhs)
23. Mathematical model study for Kandi project (WAPCOS, Rs.14.00 Lakhs)
24. Mathematical model study for Lower Damodar (Jacobs - CES, Rs.20.22 Lakhs)
25. MIX DESIGN FOR RECYCLED ASPHALT PAVEMENT MATERIAL (DAPM) (Raebareilly-Allahabad Highway Pvt Ltd, Rs.0.00 Lakhs)
26. P K Sinha Centre Project (PKS) (Dr. Prabhakant Sinha, Rs.0.00 Lakhs)
27. Performance evaluation study in respect of work - Keliaghai-Kapaleswari-Baghai Drainage basin scheme - (Phase-II, 2012- 2013) (Flood Management Programme, Govt. of INDIA and Govt. of West Bengal, Rs.0.00 Lakhs)
28. Performance Evaluation Study on Flood Control Scheme for Kapaleswari-Keliaghai-Baghai (KKB) Drainage Basin for Phase-I, 2010-2011 (Govt. of West Bengal, Rs.9.70 Lakhs)
29. Performance Evaluation Study on Flood Control Scheme for Kapaleswari-Keliaghai-Baghai (KKB) Drainage Basin for Phase-II, 2012-2013 (Govt. of West Bengal, Rs.20.00 Lakhs)
30. Preparation of city development plan for Burdwan planning area (BDAP) (BDA, Burdwan, Rs.11.23 Lakhs)
31. Preparation of detailed design for Chromium Effluent Treatment Plant (Saruabil Chromite Mines,M/s Misrilall Mines (P) Ltd., Jajpur Road, Rs.22.47 Lakhs)
32. Preparation of Zonal Developmental Plan for 14 Planning Zones of Bhubaneswar Development Plan Area (Bhubaneswar Development Authority, Rs.391.63 Lakhs)
33. Proof Checking of pavement design for NH-34 (HCC Ltd, Malda, W.B, Rs.2.00 Lakhs)
34. PROOF CHECKING OF PAVEMENT DESIGN FOR SH13 IN WEST BENGAL (PCSW) (WBHDC, Rs.0.00 Lakhs)
35. Proof Checking of Pavement Design Report (CPDR) (Simplex Infrastructures Limited, Kolkata, India, Rs.2.00 Lakhs)
36. PROOF CHECKING OF PAVEMENT DESIGN REPORT (CPDR) (Simplex Infrastructure Ltd, Rs.0.00 Lakhs)
37. Proof Checking of Structural design of bridges for Package-I (Gopvernment of West Bengal, Rs.0.00 Lakhs)
38. Review and scrutiny of seismic designs for earth structures (Sardar Sarovar Narmada Nigam Limited, Gandhinagar, Rs.7.20 Lakhs)
39. REVIEW OF MIX DESIGN FOR RECYCLED MIX FOR NH-5 PROJECT (RDRM) (BSCPL, Rs.0.00 Lakhs)
40. Relyview of Traffic Demand Projection and Transportation design for Dankuni Chandannagar-Kalyani More under WBHDCL (WBHDCL, Govt. of West Bengal, Rs.2.53 Lakhs)
41. Revision/Amendment of the Landuse and Development Control Planfor Old Haldia Planning Area (HDA, Haldia, Rs.55.15 Lakhs)
42. Roughness Measurement on Second Vivekananda Bridge (RMSB) (Second Vivekananda Tollway Bridge Company Private Limited, Kolkata, India, Rs.1.34 Lakhs)
43. Safety Consultancy Service for Six-Laning of Dankuni-Kharagpur Section of NH-6 (National Highway Authority of India, Rs.90.00 Lakhs)
44. Safety Consultancy Services for Six Laning of Dankuni-Kharagpur Section of NH-6 from Km 17.6 to Km 129 in West Bengal (NHAI, Govt. of India, Rs.90.55 Lakhs)
45. Seismic hazard at bridge sites of Tupul-Jiribam railway line (Stup Consultants, Rs.2.80 Lakhs)
46. Seismic Vulnerability Assessment of Building Types in India (NDMA, Rs.25.20 Lakhs)
47. Storm water outflow drainage plan and subsurface drainage plan (Keventer Projects Ltd., Kolkata, Rs.6.18 Lakhs)
48. Strengthening of Weak Formation and Rehabilitation Work in Malda Division of Eastern Railway (WFAW) (Eastern Railway, Rs.8.65 Lakhs)



49. Structural Evaluation of NH-6 Section Reinforced with Geogrid (SNRG) (HMBS Textiles Pvt. Ltd, Delhi, India, Rs.1.50 Lakhs)
50. Subsurface investigation and design of ground improvement for Paradip Port stack yards (Paradip Port Trust, Rs.12.36 Lakhs)
51. Tank Wagon Unloading (IOCL, Rs.8.00 Lakhs)
52. Technical Assistance for Remediation of Hexavalent Chromium from Mine Effluent & Surface Runoff in South Kaliapani Mines of OMC Ltd. (The Odisha Mining Corporation Ltd., OMC House, Bhubaneswar, Rs.44.94 Lakhs)
53. TESTING OF ITERFIBRA AND SUPERPLAST AS ASPHALT ADDITIVES (ASAA) (Iterchimica, Italy, Rs.0.00 Lakhs)
54. Third Party Inspection of Construction of Pravasi Bharatiya Kendra (MOIA, Rs.88.24 Lakhs)
55. Tokisud flood protection embankment vetting (GVK Coal, Rs.7.08 Lakhs)
56. Travel Demand Forecasting for Selected State Highways in West Bengal (RITES, Govt. of India/ WBHDCL, Govt. of West Bengal, Rs.6.74 Lakhs)
57. Vertical turbine type cw pump suction problems due to pump-system interaction (WPIL Limited, Kolkata, Rs.5.70 Lakhs)
58. Vetting design of elevated canal structure (Scott Wilson Pvt. Ltd., Rs.25.00 Lakhs)
59. Vetting of structural drawings for New 4 MGD Water Supply Project (WAPCOS Ltd., Jalsampad Bhawan, 10th Floor, Salt Lake, Kolkata, Rs.6.74 Lakhs)
60. Vetting the Design of DNMC Canal and Associated Hydraulic Structures (Scott Wilson India Private Limited (SWIPL), Rs.24.00 Lakhs)
61. Vibration of Gate Complex G. C. Berth Main Gate at H.D.C.,Haldia (Kolkata Port Trust, Haldia Dock Complex, Rs.0.00 Lakhs)

### ***Technology Transferred***

1. States of Uttar Pradesh and Mizoram - Cell-Filled Concrete Workshop : Rs. 0.00 Lakh

### ***Patents (filed / granted)***

1. 3. Development of cost effective membrane cathode assembly for a single chambered microbial fuel cell
2. Earthen material based cathode separator assembly for bioelectrochemical system

### **Visits Abroad by Faculty Members**

1. Dey, Subhasish - Visiting Professor (Tsinghua University, Beijing, China, ) 17 to 21 June 2013
2. Dey, Subhasish - Visiting Professor (Università della Calabria, Italy, ) 7 to 12 July 2013
3. Dey, Subhasish - Chair of a Session, 35th IAHR World Congress (Chingdu, China, ) 8 to 13 September 2013
4. Ghangrekar, Makarand Madhao - Possibility of collaborative research work (University of Bremen and Augusburg, Germany, ) 3 to 18 July 2013
5. Ghangrekar, Makarand Madhao - Presentation of paper in MRE-2013 (Athens, Greece, ) 30 June to 3rd July
6. Dhang, Nirjhar - Academic Visit, JICA and UOT (Sendai and Tokyo, Japan, ) JUNE 3-7, 2013
7. Mitra, Sudeshna - To avail Raman Fellowship and establish collaborative work on Road Traffic Safety Research for India (Johns Hopkins International Injury Research Center, ) January 2014 to June 2014
8. Mitra, Nilanjan - To avail Raman Fellowship and establish collaborative work on continuum modeling of material defects (Carnegie Mellon University, Pittsburgh, USA, ) January 2014 to June 2014
9. Biligiri, Krishna Prapoorna - International Conference: 93rd Annual Meeting, Transportation Research Board (Washington, DC. USA, ) 12-16 January 2014

10. Sen Gupta, Aniruddha - Project meeting & project presentations (Vienna, Austria, ) 20 days

### **Invited Lectures by Faculty Members**

1. Structural Stability of Plates and Shell Panels Subjected to Non-uniform edge Loading *by* Ramachandra, Lingadahally (PDA College of Engineering, Gulbarga)
2. Dynamic Instability of Cylindrical Shells and Shell Panels subjected to Dynamic Partial Axial Loadin *by* Ramachandra, Lingadahally (NIT Rourkela)
3. Unsteady Flows in Pipelines *by* Reddy, Hanmaiahgari Prashanth (NIT Warangal)
4. fundamental experiments in sedimentation *by* Reddy, Hanmaiahgari Prashanth (SIT Bhubaneswar)
5. Unsteady flows in Pipelines *by* Reddy, Hanmaiahgari Prashanth (IIT Hyderabad)
6. Disinfection and Disinfection By-products in chlorinated drinking water: A review *by* Goel, Sudha (Gujarat Technological University, Chankheda)
7. Analysis of Compressive Strength of Sustainable Concrete incorporating Nano-Silica and Recycled Ag *by* Barai, Sudhir Kumar (IEI, Nagpur)
8. Career Planning *by* Barai, Sudhir Kumar (NIT Sikkim)
9. How to make good technical presentation *by* Barai, Sudhir Kumar (NIT Sikkim)
10. Neural Networks Applications in Structural Health Monitoring *by* Barai, Sudhir Kumar (NIT Silchar)
11. An Overview of Computational Intelligence Tools *by* Barai, Sudhir Kumar (NIT Silchar)
12. Neural Networks Applications in Earthquake Engineering *by* Barai, Sudhir Kumar (NIT Silchar)
13. Risk and reliability issues in infrastructure management, □? Indo Canadian Workshop on Sustainable I *by* Bhattacharya, Baidurya (New Delhi)
14. Treatment of uncertainty in structural engineering problems, □? SERB □?DST Brain Storming Workshop *by* Bhattacharya, Baidurya (IISc Bangalore)
15. Arsenic: an environmental menace *by* Pal, Anjali (Manipur University)
16. Treatment by Dye wastewater by Advanced Oxidation Processes via Nanopartic *by* Pal, Anjali (Burdwan University)
17. Dye Wastewater Treatment by Adsolubilization and Advanced Oxidation Processes Mediated by Nanopartic *by* Pal, Anjali (Pt. Ravishankar Shukla University, Raipur, Chhattisgarh)
18. Size Effect in Concrete *by* Deb, Arghya (IIT Kanpur)
19. Computational Methods in Structural Engineering *by* Deb, Arghya (IISC Bangalore)
20. Seismic Analysis of Dams *by* Maity, Damodar (NIT Durgapur)
21. Seismic Modeling of RC Bridges *by* Maity, Damodar (NIT Durgapur)
22. Hydroclimatic Analysis of Drought in a River Basin *by* Maity, Rajib (Government College of Engineering, Aurangabad)
23. Environmental Awareness *by* Goel, Sudha (IIT Kharagpur for NCC cadets)
24. Aerosols and their climate impacts: scenario over Indian subcontinent and ocean *by* Verma, Shubha (IIT Madras)
25. Factors affecting the roadways through the landslide prone areas in the eastern Himalayas *by* Sen Gupta, Aniruddha (University of Natural Resources and Life Sciences, Vienna)
26. Sustainable water and wastewater management- present Indian and global scenarios *by* Desai, Venkappayya R (Government College of Engineering, Aurangabad, Maharashtra)

### **Books Published**

1. Damodar Maity: Computer Analysis of Framed Structures *published by* I.K. International Publishing House Pvt. Ltd. (2007)

2. Kousik Deb and Sunil Ranjan Mohapatra: Settlement Response of Stone Column-Improved Soft Soil Due to Embankment Loading: Advances in Ground Technology & Geo-Information *published by* Research Publishing, Singapore (2012)
3. Kumar S. and Barai S V: Concrete Fracture Models and Applications, Springer *published by* Springer (2011)
4. Mitra, S., Pravallika K.: An Approach to tackle Urban Congestion and Vehicle Emission by manipulating Transport Operations and Vehicle Mix: In Mitigating Climate Change *published by* Springer (2013)
5. Washington, S.P., Van Schalkwyk, I., Mitra, S., Meyer, M., and Dumbaugh, E: Incorporating Safety into Long range Transportation Planning *published by* Transportation Research Board, Washington DC (2006)

#### ***Short-Term Courses, Training Programmes and Workshops organised***

1. Finite Element Analysis for RDSO Engineers (5 days)
2. Inservice Training Program on Hydrology and Water Resources Engineering (April 25-27, 2013)

#### ***Papers Published in Journals***

1. 3-D Finite Element Analysis for Dynamic Response of Rigid Pavement Subjected to Moving Load *By* V. A. Sawant, V. A. Patil and Kousik Deb *Journal of Structural Engineering* 40(3), pp: 236-244 (2013)
2. 3-D Finite Element Dynamic Analysis of Rigid Pavement Using Infinite Elements *By* V. A. Patil, V. A. Sawant and Kousik Deb *International Journal of Geomechanics, ASCE* 13(5), pp: 533-544 (2013)
3. A deterministic thermostat for controlling temperature using all degrees of freedom *By* Patra, P. and Bhattacharya, B. *Journal of Chemical Physics* 140:064106 (2014)
4. A generalized Ritz-Based method for the nonlinear buckling of thin cylindrical shells *By* Probal Som, Arghya Deb *Thin Walled Structures* 76, 14-27 (2014)
5. A numerical and experimental study of hollow steel pile in layered soil subjected to lateral dynamic loading *By* Bhowmick D, baidya, D K and dasgupta S P *Soil Dynamics and Earthquake Engineering* 53, 119-129 (2013)
6. Aerosol optical and physical properties during winter monsoon pollution transport in an urban environment *By* Verma, S., Bhanja, S. N., Pani, S. K., and Misra, A. *Environ. Sci. Pollut. Res.* 21 (7), 4977-4994 (2014)
7. Application of sediment microbial fuel cell for in situ reclamation of aquaculture pond water quality *By* T.K. Sajana, M.M. Ghangrekar, A. Mitra *Aquacultural Engineering* 57, 101–107 (2013)
8. Arsenic stabilized Cu<sub>2</sub>O nanoparticle catalyst for one-electron transfer reversible reaction *By* R. Sahoo, S. Dutta, M. Pradhan, C. Ray, A. Roy, T. Pal, Anjali Pal *Dalton Trans.* In press (2014)
9. Bearing capacity of foundations on slopes. *By* Chakraborty, D., and Kumar, J. *Geomechanics and Geoengineering: An International Journal, Taylor and Francis* 8, pp. 274–285 (2013)
10. Bearing capacity of foundations with inclined ground water seepage. *By* Kumar, J., and Chakraborty, D. *International Journal of Geomechanics, American Society of Civil Engineers (ASCE)* 13, pp. 611–624 (2013)
11. Bearing Capacity of Geotextile-Reinforced Sand with Varying Fine Fraction *By* Kousik Deb and Sanku Konai *Geomechanics and Engineering: an International Journal, Techno Press* 6(1), pp: 333-45 (2014)
12. Bearing capacity of interfering multiple strip footings by using lower bound finite elements limit analysis. *By* Kumar, J. and Bhattacharya, P. *Computers and Geotechnics* 37 (5), 731-736 (2010)

13. Bearing capacity of piles in soft clay underlain by cohesive frictional soil. By Chakraborty, D., and Kumar, J. *International Journal of Geomechanics, American Society of Civil Engineers (ASCE)* 13, pp. 311–317 (2013)
14. Bearing capacity of strip foundations in reinforced soils. By Chakraborty, D., and Kumar, J. *International Journal of Geomechanics, American Society of Civil Engineers (ASCE)* 14, pp. 45-58 (2014)
15. Bearing capacity of two interfering strip footings from lower bound finite elements limit analysis By Kumar, J. and Bhattacharya, P. *International Journal for Numerical and Analytical methods in Geomechanics* 37, 441-452 (2013)
16. Behaviour of geosynthetic reinforced unpaved roads under cyclic loading By Ravi K., Dash, S.K., Vogt S. and Braeu, G. *Indian Geotechnical Journal* Vol.44, pp.77-85 (2014)
17. Buckling and postbuckling response of sandwich panels under non-uniform mechanical edge loadings By Tanish Dey and L.S. Ramachandra *Composites: Part B* 60, 537-545 (2014)
18. Characteristics of Mortars containing colloidal Nanosilica By Mukharjee, BB and Barai, SV *International Journal of Applied Engineering Research* 17-22 (2014)
19. Characterizing drought using the reliability-resilience-vulnerability concept, special issue on Data Driven Approaches to Droughts By Maity, Rajib, A. Sharma, D Nagesh Kumar and K. Chanda *Journal of Hydrologic Engineering* 18(7), 859-869 (2013)
20. Chloride diffusion study in different types of concrete using finite element method (FEM) By Paul, S K, Chodhuri, S. and Barai, S.V. *Advances in Concrete Construction* 39-56 (2014)
21. Comparison of oxygen and hypochlorite as cathodic electron acceptor in microbial fuel cells By Jadhav D.A., Ghadge A.N., Debika Mondal, Ghangrekar M.M. *Bioresource Technology* 154, 330-335 (2014)
22. Critical factors influencing the dynamic characteristics of FRP bridges- a parametric study By Althaf M Mohammed and S Chakraborty *International Journal of Reinforced Plastics and Composites* Vol. 33, 223 – 22 (2013)
23. Damage Assessment of Beams from Changes in Natural Frequencies using Ant Colony Optimization By Aditi Majumdar, Ambar De, Damodar Maity and Dipak Kumar Maiti *Structural Engineering and Mechanics - An International Journal* 45(3), pp. 387-406 (2013)
24. Damage Assessment of Frame Structure using Quadratic Time-Frequency Distributions By S. Chandra and S. V. Barai *Structural Engineering and Mechanics, An International Journal* 411-4125 (2014)
25. Defluoridation of drinking water in batch and continuous-flow electrocoagulation systems By Manoj Babu, J. and S Goel *Pollution Research* 32 (4): 727-736 (2013)
26. Dependency of Ngama on footing diameter for circular footings. By Chakraborty, D., and Kumar, J. *Soils and Foundations, Japanese Geotechnical Society, Elsevier* 53, pp. 173-180 (2013)
27. Development of HydroClimatic Conceptual Streamflow (HCCS) Model for Tropical River Basins By Bhagwat P.P. and Rajib Maity *Journal of Water and Climate Change* 5(1), 36-60 (2013)
28. Difference in Perceptions of Captive and Choice Riders towards Bus Service Attributes and the Need for Segmentation of Bus Services in Urban India By Maitra, B., Dandapat, S., and Phanikumar, C.V. *Journal of Urban Planning and Development* (in Press) (2014)
29. Durability of transesterified jute geotextiles By Saha, P., Roy, D., Manna, S., Adhikari, B., Sen, R., and Roy, S. *Geotextiles and Geomembranes* 35, 69-75 (2012)
30. Effect of Ageing of Different Modified Bituminous Binders: Comparison between RTFO and Radiation Ageing, Materials and Structures By 19. Naskar, M. Reddy, K. S, Chaki, T. K., Divya MK and Deshpande, AP *Materials and Structures* Vol 46, Issue 7, pp. (2013)
31. Effect of Cathode Biofilm and Non-feeding condition on Performance of Membrane-less Microbial Fuel Cell Operated under Different Organic By 11. P. Sridhar, M.M. Ghangrekar, R.D. Tyagi, R.Y. Surampalli *International Journal of Environmental Protection* 2, 8-14 (2013)

32. Effect of Model Specification on Valuation of Travel Attributes: A Case Study of Rural Feeder Service to Bus Stop By Maitra, B., Ghosh, S., Das, S. S., and Boltze, M *Journal of Transport Literature* 7(2), 8-28 (2013)
33. Effect of presence of cellulose in the freshwater sediment on the performance of sediment microbial fuel cell By 8. T.K. Sajana, M.M. Ghangrekar, A. Mitra *Bioresource Technology* 155, 84-90 (2014)
34. Effect of Specimen Geometries on Asphalt Mixtures' Phase Angle Characteristics By Krishna P. Biligiri, and Kamil E. Kaloush *Construction and Building Materials* in Press (2014)
35. Effects of bed compaction on scour at piers in sand-clay mixtures By Link O, Klischies K, Montalva G and Dey S *ASCE Journal of Hydraulic Engineering* 139, 1013-1019 (2013)
36. Enhanced biodegradation resistance of biomodified jute fibers By Manna, S., Saha, P., Roy, D., Sen, R., Adhikari, B., and Das, S. *Carbohydrate Polymers* 93, 597-603 (2013)
37. Enzymatic processing of chitinaceous wastes for N-acetyl-D-glucosamine production: an example of green and efficient environment management By Das, S., Sen, R., and Roy, D. *Environmental Engineering and Management Journal* 11, 1849-1855 (2012)
38. Estimation of Design Parameters for Braced Excavation: Numerical Study By S.S. Chowdhury, K. Deb and A. Sengupta *Intl J. of Geomechanics* 13(3) 234-247 (2013)
39. Evaluation of Rehabilitated Urban Recycled Asphalt pavement By 20. M. Amaranatha Reddy, K. Sudhakar Reddy and B.B. Pandey *International Journal of Road Materials and Pavement Design* Pre-print edition pu (2014)
40. Experimental Investigations and Critical Observations on the Use of Modal Parameters for Structural Damage Detection By S. Chandra & S. V. Barai *Current Advances in Civil Engineering* 6-15 (2014)
41. Fabrication and Performance of solution based micro-patterned DNA functionalized carbon nanotube network as humidity sensors By Paul, A., Bhattacharya, B. and Bhattacharyya, T.K. *IEEE Trans. on Nanotechnology* 13(2):335-342 (2014)
42. Field Test on Group Piles under Machine Induced Coupled Vibration By Biswas S, Choudhar SS, Manna, B and Baidya D K *International Journal of Geoengineering Case Histories* Vol 3(1), 10-23 (2013)
43. Galvanic replacement of As(0) nanoparticles by Au(III) for nanogold fabrication and SERS application By Anjali Pal, S. Saha, S. Maji, R. Sahoo, M. Kundu, A. Kundu *New Journal of Chemistry* 38(4), 1675-1683 (2014)
44. Geostatistics-based design of regional groundwater monitoring framework By A. Dhar *ISH Journal of Hydraulic Engineering* 19(2), 80-87 (2013)
45. Graphene oxide impregnated PVA-STA composite polymer electrolyte membrane separator for power generation in single chambered Microbial Fuel Cell By Khilari, Santimoy Pandit, Soumya Ghangrekar, Makarand M. Pradhan, Debabrata Das, Debabrata *Industrial & Engineering Chemistry Research* 52 (33), 11597-11606 (2013)
46. Gravity waves on turbulent shear flow: Reynolds averaged approach By Bose SK and Dey S *ASCE Journal of Hydraulic Engineering* 140, 340-346 (2014)
47. Green synthesis and reversible dispersion of a giant fluorescent cluster in solid and liquid phase By M. Ganguly, J. Pal, S. Das, C. Mondal, Anjali Pal, Y. Negishi, T. Pal *Langmuir* 29(34), 10945-10958 (2013)
48. Horizontal Pullout Capacity of a Group of Two Vertical Anchors in Clay. By Bhattacharya, P. and Kumar J. *Geomechanics and Engineering* 5(4), 299-312 (2013)
49. Horizontal Pullout Capacity of a Group of Two Vertical Strip Anchors Plates Embedded in Sand. By Bhattacharya, P. and Kumar, J. *Geotechnical and Geological Engineering* 30(2), 513-521 (2012)
50. Hydroclimatic Streamflow Prediction using Least Square-Support Vector Regression By Bhagwat P.P. and Rajib Maity *ISH Journal of Hydraulic Engineering* 19(3), 320-328 (2013)
51. Identification of Hydrologic Drought Triggers from Hydro-climatic Predictor Variables By Maity Rajib, R. Meenu, R.S. Govindaraju *Water Resources Research* 49, 1-17 (2013)

52. Influence of geosynthetic encasement on the performance of stone columns floating in soft clay By Dash, S.K. and Bora M.C. *Canadian Geotechnical Journal* Vol. 50, pp. 754-765 (2013)
53. Influence of Nano-Silica on the Compressive Strength of Recycled Aggregate Concrete By Mukharjee, BB and Barai, S V *International Journal of Civil Engineering and Applications* 35-38 (2013)
54. Influence of Nano-Silica on the properties of recycled aggregate concrete By Mukharjee, BB and Barai, S V *Construction and Building Materials* 29-37 (2014)
55. Influence of subgrade strength on the performance of geocell-reinforced foundation systems By Biswas, A., Murali Krishna, A. and Dash, S.K. *Geosynthetics International* Vol. 20, pp.376-388 (2013)
56. Inter-seasonal heterogeneity in radiative impact and sources of black carbon aerosols in an urban environment over eastern India By Pani, S. K. and Verma, S. *Journal of Geophysical Research* 2014JD021816 (2014)
57. Investigating the Relative Influence of Various Factors in Bicycle Mode Choice By Majumdar B.B and Mitra, S. *Procedia - Social and Behavioral Sciences* 104, 1120–1129. (2013)
58. Linearization of Drucker-Prager yield criterion for axisymmetric problems: Implementation in lower bound limit analysis. By Kumar, J., and Chakraborty, D. *International Journal of Geomechanics, American Society of Civil Engineers (ASCE)* 13, pp. 153-161 (2013)
59. Mechanical Properties of Recycled Aggregate Concrete Containing Colloidal Nano-Silica Designed by Taguchi Method By Prusty, R Mukharjee, BB and Barai, SV *International Journal of Civil Engineering and Applications* 5-8 (2013)
60. Modelling Severity Level in Multi-vehicle Collision on Indian Highways By Bandyopadhyaya, R. and Mitra, S. *Procedia - Social and Behavioral Sciences* 104, 1011–1019 (2013)
61. Noise-Damping Characteristics of Different Pavement Surface Wearing Courses By Krishna P. Biligiri, and George B. Way *Journal of Road Materials and Pavement Design* DOI:10.1080/14680629 (2014)
62. of fracture parameters of FRP composites: a combined experimental and numerical investigation By Dipak Rakshit and Sushanta Chakraborty *International Journal of Composite Materials* (0)
63. On core compressibility of sandwich composite panels subjected to intense underwater shock loads By Ghoshal, R., Mitra, N. *Journal of Applied Physics* 115(2) 024905 (2014)
64. On improving the solution by using lower bound finite elements limit analysis and linear programming. By Kumar, J. and Bhattacharya, P. *Geotechnical and Geological Engineering* 29(4), 619-626 (2011)
65. On shock response of nano-void closed/open cell Copper material: Nonequilibrium molecular dynamic simulations By Neogi, A., Mitra, N. *Journal of Applied Physics* 115(1) 013504 (2014)
66. Parameter Estimation for a System of Beam Resting on Stone Column-Reinforced Soft Soil By Kousik Deb and Anirban Dhar *International Journal of Geomechanics, ASCE* 13(3), pp: 222-233 (2013)
67. Partial safety factors for retaining walls and slopes: A reliability based approach By GuhaRay A and Baidya D K *Geomechanics and Engineering* Vol 6(2), 99-115 (2014)
68. Performance improvement of soft clay foundation using stone columns and geocell-sand mattress By Dash, S.K. and Bora, M.C. *Geotextiles and Geomembranes* Vol. 41, pp. 26-35 (2013)
69. Performance metrics in a hybrid MPI-OpenMP based molecular dynamics simulation of nanoindentation By Pal, A., Agarwala, A., Raha, S. and Bhattacharya, B. *Journal of Parallel and Distributed Computing* 74(3):2203-2214 (2014)
70. Physical and Chemical Characterization of Pond Ash By Prasenjit Ghosh and Sudha Goel *International Journal of Environmental Research and Development* 4(2): 129-134 (2014)

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72. Prediction of Remaining Fatigue Life of Flexible Pavements using Laboratory – Field Correlations By Krishna P. Biligiri, and Safwat H. Said *Journal of Materials Engineering, American Society of Civil Engineers* in Press (2014)
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96. Variability of winter and summertime aerosols over eastern India urban environment By Pani, S. K. and Verma, S. *Atmospheric Research* 137, 112-124 (2014)
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#### ***Papers Presented in Conferences***

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2. Performance of microbial fuel cell under psychrophilic and mesophilic temperature, By 5. Chatterjee, P., Mondal, S., Tiwari, B.R., Ghangrekar, M.M, *International Conference on Energy Resources and Technologies for Sustainable Development (ICERTSD 2013)*, Bengal Engineering and Science University, (2013)
3. A Comparative Study to Simplify Lower Bound Finite Elements Method Using Linear Programming for Geotechnical Stability Problem., By Bhattacharya, P. and Kumar, J., *Indian geotechnical Conference,, IGC-2011 Cochi.,* (2011)
4. A composite method for wastewater treatment and electricity generation combining wetland treatment technology with sediment microbial fuel cell, By Mypati, S.N., Ghangrekar, M. M, *International Conference on Advances in Biological Hydrogen Production and Applications (ICABHPA-2012)*, Hyderabad, India, (2012)
5. A novel microbial desalination cell for simultaneous wastewater treatment, energy production, and desalination , By Pradhan, H., Ghangrekar, M.M, *International Symposium on New Horizons in Bioenergy Research organized by P K Sinha Center for BioEnergy, IIT Kharagpur, India,* (2013)
6. Aerosol Radiative Forcing Over India During the Winter Monsoon Due to Emissions from Source Categories and Geographical Regions, By Shubha Verma, *AOGS - AGU (WPGM) Joint Assembly,* Singapore, (2012)
7. Analysis of Compressive Strength of Sustainable Concrete Incorporating Nano-Silica and Recycled Aggregates., By Mukharjee, BB and Barai, SV, *All India Seminar on Innovations In Green Building Technology( IGBT 2014)*, Nagpur, (2014)



8. Applicability of planar geogrid reinforcement in geocell-reinforced foundation systems, By Biswas, A., Krishna, A.M., Dash, S.K, *Indian Geotechnical Conference*, Roorkee, (2013)
9. Application of Distance Decay to Investigate Bicycle Trip Lengths in Small-Sized Indian Cities, By Majumdar B.B and Mitra, S., *Transportation Research Board Annual Conference*, Washington, D.C., (2014)
10. Arsenic Removal From Aqueous Samples In Batch Electrocoagulation Studies, By Anshul Sharma, Sri Malini Adapureddy, Sudha Goel, *ICEE 2014*, Pune, (2014)
11. Asphalt Rubber Aging Properties Compared to Neat Asphalt, By George B. Way, and Krishna P. Biligiri, *International Journal of Pavements Conference*, Sao Paulo, Brazil, (2013)
12. Assessment of bid evaluation strategies in Indian Construction industry using analytical hierarchy Process (AHP) Model, By Neelesh Agrawal and S V Barai, *The 1st International Conference on Construction and Building Engineering ICONBUILD 2013*, Johor Bahru, Malaysia, (2013)
13. Assessment of Water Quality of Three Different Aquatic Environments Over Three Seasons, By Tandra Mohanta and Sudha Goel, *ICEE 2014*, Pune, (2014)
14. Behaviour of Concrete Containing Recycled Coarse Aggregate and Nanosilica., By Mukharjee, BB and Barai, SV, *National Conference on Recent Advances on Structural Engineering (RASE 2013)*, Hyderabad, (2013)
15. Behaviour of geocell reinforced granular soils, By Priyadarshee, A., Dash, S.K., *Indian Geotechnical Conference*, Roorkee, (2013)
16. Biodegradation of Organic Materials under Aerobic Conditions, By B.R.Hiremath and Sudha Goel, *ICEE 2014*, Pune, (2014)
17. Bioelectricity Generation from Fishery wastewater by Air Cathode Earthen Microbial Fuel Cell, By Noori, Md.T., Ghangrekar, M.M., Mitra, A, *International Symposium on New Horizons in Bioenergy Research organized by P K Sinha Center for BioEnergy*, IIT Kharagpur, India, (2013)
18. Bioethanol Production from *Salvinia Cuculata* Using *Saccharomyces cerevisiae*, By 10. Mishra, G.S., Mitra, A., Banarjee, R., Ghangrekar, M.M, *International Symposium on New Horizons in Bioenergy Research organized by P K Sinha Center for BioEnergy*, IIT Kharagpur, India, (2013)
19. Characteristics of Mortars containing colloidal Nanosilica., By Mukharjee, BB and Barai, SV, *2nd International Conference on Sustainable Innovative Techniques in Civil and Environmental Engineering (SITCEE- 2014 )*, New Delhi, (2014)
20. Compressive Strength of Nano-Silica Incorporated Recycled Aggregate Concrete., By Mukharjee, BB and Barai, SV, *Proceedings of International Conference on Latest Trends in Civil, Structural, Environmental and Infrastructure Engineering (ICLTCEIE- 14)*, Chennai, (2014)
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72. Validation of aerosol properties from Tiger-z measurements with GCM simulations, during pre-monsoon, By Dudam Bharath Kumar and Shubha Verma, , , (0)
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74. Wall-wake flows downstream of a spherical particle placed on a gravel bed, By Dey S, Sarkar S, Bose S K, Tait S and Castro-Orgaz O, *Proceedings of Thirty-Fifth International Association for Hydraulic Research World Congress*, Chengdu, China, (2013)
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76. Wastewater as Anolyte for Bioelectricity Generation in Single Chambered Microbial Fuel Cell: Effect of Different 3D Anode and Organic Loading Rate, By 17. Soumya Pandit, Vinay Patel, M.M. Ghangrekar and Debabrata Das, *1st International Brainstorming Workshop On Waste To Energy In India*, Nehru Centre, Mumbai, India, (2012)

## Department of Computer Science & Engineering

### **Head**

Prof. Rajib Mall

### **Professors**

Basu, Anupam	<i>Ph.D.(IIT Kharagpur),</i>
Chakrabarti, Partha Pratim	<i>Ph.D.(IIT Kharagpur),</i> Artificial Intelligence, CAD for VLSI & Embedded Systems, Design of Algorithms, Reliable and Fault Tolerant Systems
Das, Partha Pratim	<i>Ph.D.(IIT Kharagpur),</i> Image Processing, Software Engineering, Language Translation, Object-Oriented Analysis & Design
Dasgupta, Pallab	<i>Ph.D.(IIT Kharagpur),</i> Artificial Intelligence, Formal Verification of Integrated Circuits and Dynamical Systems
Ganguly, Niloy	<i>Ph.D.(BESU, Calcutta),</i> Peer-to-peer Networks, Online Social networks, Network Theory, Wireless Internet, Delay Tolerant Networks
Ghose, Sujoy	<i>Ph.D.(IIT Kharagpur),</i> System Intelligence, Networking, Algorithms
Gupta, Arobinda	<i>Ph.D.(Iowa),</i> Distributed Systems, Mobile Computing
Kumar, Rajeev	<i>Ph.D.(Sheffield),</i> Programming Language & Software Engineering, Multiobjective Optimization & Evolutionary Computing, EDA & Embedded Systems, Multimedia Systems & Video Transcoding, Education Standards & Quality
Majumder, Arun Kumar	<i>Ph.D.(Cal),Ph.D.(Florida),</i> Database and Multimedia Systems, Information Security, Medical Informatics and Telemedicine
Mall, Rajib	<i>Ph.D.(IISc Bangalore),</i> program analysis and testing
Mandal, Chittaranjan	<i>Ph.D.(IIT Kharagpur),</i> VLSI CAD, Networking, Formal Verification
Mukhopadhyay, Jayanta	<i>Ph.D.(IIT Kharagpur),</i> Bio-Informatics, Medical Informatics, Image processing
Pal, Ajit	<i>Ph.D.(Calcutta Univ),</i> CAD for Low Power Embedded systems Computer Networks
Pal, Sudebkumar Prasant	<i>Ph.D.(IISc Bangalore),</i> Design and analysis of algorithms, Computational and combinatorial geometry, Graph theory and algorithms
Roychowdhury, Dipanwita	<i>Ph.D.(IIT Kharagpur),</i> 1. Cryptography 2. Cellular Automata 3.Error Correcting Code 4. VLSI
Sarkar, Dipankar	<i>Ph.D.(IIT Kharagpur),</i> Formal Verification of circuits and systems, Logic and Automated theorem Proving
Sarkar, Sudeshna	<i>Ph.D.(IIT Kharagpur),</i> Machine learning, Natural Language Processing, Data Mining, Information Retrieval
Sengupta, Indranil	<i>Ph.D.(Calcutta Univ),</i> VLSI design and testing, Cryptography and network security, Reversible computing

**Associate Professors**

Bhowmick, Partha	<i>Ph.D.(ISI, Kolkata)</i> , Algorithmic Art, Geometric Algorithms, Computer Graphics, Visual Pattern Recognition, Digital Geometry, Combinatorial Image Analysis
Das, Abhijit	<i>Ph.D.(IISc Bangalore)</i> , Cryptography, Computational Number Theory, Parallel and Distributed Implementations
Mitra, Pabitra	<i>Ph.D.(ISI Calcutta)</i> , Machine Learning, Data Mining, Information Retrieval
Mukhopadhyay, Debdeep	<i>Ph.D.(IIT Kharagpur)</i> , Computer Architecture and Security, Cryptology, VLSI, Embedded systems for Cryptographic Systems, Side Channel Analysis

**Assistant Professors**

Bhattacharya, Sourangshu	<i>Ph.D.(IISc. Bangalore)</i> , Big Data, Machine Learning, Optimization
Chakraborty, R S	<i>Ph.D.(CWR Univ.USA)</i> , Hardware Design for Security, Digital Watermarking, VLSI Design and Methodologies
Dey, Soumyajit	<i>Ph.D.(IIT Kharagpur)</i> , Formal Methods for Embedded System Design and Verification, High Performance Architecture, Assistive Technologies, For more information: <a href="http://cse.iitkgp.ac.in/~soumya/">http://cse.iitkgp.ac.in/~soumya/</a>
Goyal, Pawan	<i>Ph.D.(University of Ulster, UK)</i> , Natural Language Processing, Information Retrieval and Extraction, Sanskrit Computational Linguistics
Mitra, Bivas	<i>Ph.D.(IIT Kharagpur)</i> , Technological network modeling, Complex and dynamic networks, Interdependent networks, Mobile networks
Mitra, Pralay	<i>Ph.D.(IISc. Bangalore)</i> , Computational Biology, Bioinformatics
Mukherjee, Animesh	<i>Ph.D.(IIT Kharagpur)</i> , Complex systems, language dynamics, social computation, web social media

**Lecturer**

Dey, Partha Sarathi	<i>M.Tech.(IIT Kharagpur)</i> , Multi Core Architecture, Operating System, VLSI, Embedded Systems
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**Faculty Appointments**

Pralay Mitra	Assistant Professor
Bivas Mitra	Assistant Professor
Sourangshu Bhattacharya	Assistant Professor
Pawan Goyal	Assistant Professor
Soumyajit Dey	Assistant Professor

### ***Brief Description of on-going activities***

Artificial Intelligence, Bioinformatics, Combinatorial and Computational Geometry, Computer Graphics, Digital Geometry, Design and Analysis of Algorithms, Graph/hypergraph theory and algorithms, Computer Networks, Cryptography, Hardware Security, Computer Architecture, Databases, Embedded Systems, Fault Tolerant Computing, Formal Verification, Image Processing and Computer Vision, Mobile Computing, Multimedia, Natural Language Processing, Object Oriented Design Tools, Parallel and Distributed Processing, Real Time Systems, Software Engineering, Speech Recognition and Synthesis, VLSI Design and CAD tools, Complex Networks,

### ***Thrust Areas***

1. Artificial Intelligence
2. VLSI Design and CAD tools
3. Cryptography
4. Hardware and Embedded Security
5. Natural Language Processing
6. Image Processing
7. Complex and Social Networks
8. Computational Biology and Bioinformatics
9. Algorithms Design and Analysis

### ***International Collaborations***

"Design and Implementation of Wireless Embedded Sensor Networks Based Old Age Home Monitoring" under India-Taiwan Programme of Cooperation in Science and Technology. Rajib Mall and Pabitra Mitra

New perspectives for computational social science, DST, India and Ministry of External Affairs, Italy, University of Rome, Italy, Animesh Mukherjee

Understanding, Leveraging and Deploying Online Social Networks, Joint project with MPI-SWS, Saarbrucken, Niloy Ganguly.

Joint Publication with TU Dresden, Germany, Duke University, USA, University of Nice, France, University of Bielefeld, Germany, UFOP, Ouro Preto, Brazil, ETH Zurich, MPI-SWS, Saarbrucken. Niloy Ganguly

Joint Publication with researchers from Georgia Tech, USA, Case Western Reserve, USA, NTU Singapore, Debdeep Mukhopadhyay.

Joint Publication with researchers in Georgia Tech., Stanford University and ISI Kolkata (Collaborators: Arindam Khan, Mridul Aanjaneya, Subhas Chandra Nandy and Arijit Bishnu), Sudebkumar P. Pal

Joint Publication with Yeditepe University, Turkey, Rajat Subhra Chakraborty and Debdeep Mukhopadhyay

Joint Publication with University of Nebraska, Omaha (Collaborators: Sanjukat Bhowmick, Tanmoy Chakraborty, Sriram Srinivasan), Niloy Ganguly and Animesh Mukherjee.

Joint organization of workshop Proofs 2013 along with CHES 2013, Santa Barbara USA.

Joint Publication with MPI-PKS, Germany (Collaborators: Naveen Sharma, Krishna Gummadi), Niloy Ganguly.

Joint Publication with UIUC (Collaborator: R. Roychoudhury), Niloy Ganguly.

Joint publication with INRIA Paris Rocquencourt (Collaborator: Gerard Huet), Pawan Goyal.

Joint Publication with ISI Foundation, Italy (Collaborators: Vittorio Loreto, Francesca Tria, Suman Kalyan Maity), Animesh Mukherjee.

Two Joint Publications with University of Wroclaw, Poland (Collaborator: Tyll Krueger, Saptarshi Ghosh, Ajitesh Srivastava), Niloy Ganguly and Animesh Mukherjee

Joint Publications with TU-Darmstadt, Germany (Collaborators: Chris Biemann, Martin Riedl, Ritwik Mitra, Sunny Mitra), Animesh Mukherjee and Pawan Goyal.

"Protein Interactor Discovery and Structure", Indo-US Science and Technology Forum (IUSSTF) Travel Grant. (Collaborators: David S. Eisenberg (UCLA), Debnath Pal (IISc), Thomas C. Terwilliger (LANL)), Pralay Mitra.

Joint workshops (with UCL Belgium, ETH Zurich): i). Dynamics on and of Complex Networks - VI (2013, Barcelona, Spain) in conjunction with ECCS 2013, ii). Dynamics on and of Complex Networks - VII (2014, Lucca, Italy) in conjunction with ECCS 2014, Bivas Mitra.

Joint publications with researchers from University of Michigan (Collaborators: David Shultis, Jeffrey R Brender, Jeff Czajka, David Marsh, Felicia Gray, Tomasz Cierpicki, Yang Zhang), Pralay Mitra.

"Evolving Communities and Information Spreading", Indo-French project with CNRS-UPMC, Paris, Niloy Ganguly and Bivas Mitra.

### ***Lectures by Visiting Experts***

1. Detection and Characterization of Intrinsic Symmetry over 3D Shapes *by* Anirban Mukhopadhyay (University of Georgia, USA)
2. Improved Approximation Algorithm for Two-Dimensional Bin Packing *by* Arindam Khan (ACO unit Georgia Institute of Technology USA)
3. Cellular automaton models for collective cell behaviour *by* Prof. Andreas Deutsch (TU Dresden, Germany)
4. From Cryptography to Hardware: Analyzing and Protecting Embedded Xilinx BRAM for Cryptographic Applications *by* Dr. Shivam Bhasin (Telecom ParisTech)
5. Applying Cognition in Complex Systems Engineering *by* Prof. Sandro Leuchter (Rhine-Waal University of Applied Sciences)
6. Challenges in Managing Complex Business Applications *by* Santonu Sarkar (Infosys)
7. Perspectives on Mobile Cloud Computing and its Applications *by* Dr. Pradipta De (University of Georgia, USA)
8. Health Data Analytics *by* Dr. Shaibal Roy (Applied Research Works)
9. Challenges in Graph Data Management *by* Jayanta Mondal (University of Maryland)
10. Trace Collection and Fault Localization for Data-centric Programs *by* Diptikalyan Saha (IBM Research)
11. Exploration and Multi-armed Bandits *by* Shivaram Kalyanakrishnan (Yahoo Labs, Bangalore)
12. Some graph theoretic and rank based approaches to understand the biology of microRNAs *by* Debarka Sengupta (Genome Institute of Singapore)



13. Quality and Energy-Sensitive Determination of Multiple Contexts in Pervasive Computing Environments *by* Nirmalya Roy (University of Maryland Baltimore)
14. CloudAdvisor: A Recommendation-as-a-Service Platform for Cloud Configuration and Pricing *by* Tridib Mukherjee (Xerox Research Centre)

***Doctoral and MS Degrees Awarded***

1. Chhabi Rani Panigrahi : Regression Test Selection and Prioritization for Object-oriented Programs(PhD)
2. Ritwika Ghose : An Enhanced Web Browser and Content Presentation Approach for the Blind People: Design and Implementation(MS)
3. Maunendra Sankar Desarkar : Algorithm for Recommendation Systems and Aggregation(PhD)
4. Priyankar Ghosh : Search Techniques for alternative solutions for and/or graphs and biobjective optimization problems(PhD)
5. Chandan Karfa : Formal Verification of Behavioural Transformations During Embedded System Design(PhD)
6. Debmalya Sinha : Design and Evaluation of a new interface for file browsing under Linux environment(MS)
7. Prasenjit Mondal : Processing of Brain MR Images(PhD)
8. Satrajit Ghosh : Improvements of Linearization-Based Algebraic Attacks on Block Ciphers(MS)
9. Debjit Pal : Automated Mixed-Signal Verification Using Monitors and Simulation Relations(MS)
10. Suman Kalyan Maity : Aspects of Opinion formation in Social Networks(MS)
11. Rajib Ranjan Maiti : Performance Analysis and Improvement of Information Dissemination Protocols in DTNS(PhD)
12. Sujoy Sinha Roy : Design and Analysis of Elliptic Curve Cryptosystems on FPGAs(MS)
13. Sumit Das : Computational Approach Improving Fluency in Bangla Sentence Generation(MS)
14. Animesh Srivastava : Impact of Attacks on Correlated P2P Network Topology: A Complex Network Approach(MS)
15. Joydeep Chandra : Topology and its Effects on the Performance of Peer-to-Peer Networks(PhD)
16. Biswajit Das : Automatic Speech Recognition of Aging Speech in Bengali(MS)
17. Subhankar Mukherjee : Assertions: From a Mixed-Signal Perspective(PhD)
18. Rebeiro Chester Dominic : Analysis of Time Driven Cache Attacks on Block Ciphers(PhD)
19. Pravanjan Choudhury : New Multiprocessor Scheduling Techniques for Dynamic Task Graphs(PhD)
20. Sandip Mandal : Automatic Speech Recognition in Bengali: Development, Application and optimizations for computer resource constrained devices(MS)
21. Soumen Bag : Processing and analysis of Bangla optical characters using geometric and topological features(PhD)
22. Saptarshi Ghosh : Online Social Networks: Evaluation and Search(PhD)
23. Rajdeep Mukherjee : Novel Approaches for Synthesis and Formal Verification of Low Power Circuits(MS)
24. Biswanath Barik : Performance Enhancement of Bengali-Hindi Machine Translation Through Syntactic Analysis Refinement(MS)
25. Sk. Subidh Ali : Differential Fault Analysis of Block Ciphers(PhD)
26. Srobona Mitra : Formal Methods for Aiding Verification of Local Design Changes in Digital Integrated Circuits(PhD)
27. Arnab Sarkar : New Approaches in Real-Time Proportional Fair Multi-Processor Scheduling(PhD)
28. Sourya Bhattacharyya : (MS)

29. Sirsendu Mohanta : Metrics-Based Early Reliability Prediction for Object-Oriented Programs(MS)
30. Debi Prosad Dogra : Algorithms for Video Assisted Analysis of Infant Neurological Examinations(PhD)
31. Sourasis Das : Formal Methods for Improving Test and Assertion Coverage(MS)
32. Prosenjit Dhole : Efficient Broadcasting in Delay Tolerant Networks(MS)
33. Tamal Sen : State Model Based Regression Test Selection for Component Based Software(MS)
34. Indrasish Saha : Attacks on FPGA Based System Implementation(MS)
35. Binanda Sengupta : SIMD based Implementations of Sieving in Integer-Factoring Algorithms(MS)

#### ***Member - Professional Bodies***

1. Kumar, Rajeev, *Senior Member* - IEEE
2. Kumar, Rajeev, *Senior Member* - ACM
3. Ganguly, Niloy, *Member* - ACM
4. Ganguly, Niloy, *Regular* - IEEE Comsoc
5. Mukhopadhyay, Debdeep, *Member* - ACM-SIGDA
6. Das, Partha Pratim, *Member and Representative of IIT Kharagpur* - Indian Unit of International Association of Pattern Recognition (IUIAPR)
7. Das, Partha Pratim, *Member* - Association for Computing Machinery (ACM)
8. Das, Partha Pratim, *Member* - VLSI Society of India (VSI)
9. Chakraborty, R S, *Member* - ACM
10. Chakraborty, R S, *Member* - IEEE
11. Mitra, Pralay, *Member* - IEEE
12. Dey, Partha Sarathi, *Regular* - IEEE Computer Society
13. Chakrabarti, Partha Pratim, *Senior Member* - IEEE
14. Chakrabarti, Partha Pratim, *Member* - ACM
15. Sengupta, Indranil, *Senior Member* - IEEE
16. Mukhopadhyay, Jayanta, *Senior* - IEEE
17. Mukhopadhyay, Jayanta, *Life Member* - Indian Association for Medical Informatics (IAMI)
18. Mukhopadhyay, Jayanta, *Life member* - Telemedicine Society of India
19. Dasgupta, Pallab, *Senior Member* - IEEE
20. Dasgupta, Pallab, *Member* - ACM
21. Roychowdhury, Dipanwita, *Life member* - CRSI (Cryptology Research Society of India)
22. Roychowdhury, Dipanwita, *Regular* - IEEE
23. Sarkar, Sudeshna, *Member* - IEEE
24. Mandal, Chittaranjan, *Regular* - IEEE
25. Majumder, Arun Kumar, *Senior Life Member* - Institution of Electrical and Electronic Engineers USA

#### ***Member - Editorial Board***

1. Chakrabarti, Partha Pratim (0) *Member* - Journal of IETE
2. Chakrabarti, Partha Pratim (0) *Member* - Journal of the Computer Society of India
3. Das, Partha Pratim (2014) *Editor-in-Chief* - Journal of the Institution of Engineers, Series B
4. Mukhopadhyay, Jayanta (2009) *Member* - Journal of Visual Communication and Image Representation

#### ***Awards & Honours***

1. Mukherjee, Animesh (2013) *NSF/TCPP CDER Center Early Adopter Award for Fall-13 from the National Science Foundation, USA*

2. Mitra, Bivas (2014) *Best Poster Award at XRCI Open 2014, Soumajit Pramanik, Bivas Mitra, Influence of Interactions on the Evolving Citation Network , Bangalore, India.*
3. Mukherjee, Animesh (2013) *DAAD IIT Faculty Exchange programme*
4. Mitra, Bivas (2014) *DAAD-IIT Faculty Exchange Fellowship*
5. Mukherjee, Animesh (2014) *INSA Medal for Young Scientist*
6. Chakrabarti, Partha Pratim (2013) *J C Bose Fellowship*
7. Mitra, Bivas (2013) *NSF TCPP Early-Adopter Award*
8. Mukherjee, Animesh (2013) *Simons Associate, ICTP, Trieste, Italy*

### ***Sponsored Research Projects***

1. 3-D Image Sensor for Capturing Minute Surface Details and Visualization by Geometric Modeling (DST, Rs.33.00 Lakhs)
2. A DEEP VALIDATION STUDY OF INDIAN LANGUAGE SYSTEM BASED ON PATTERNS OF A) COMPARATIVE PHILOLOGY, PHONOLOGY & PHONETICS & B) PSYCHO-PHYSICS OF VARNAMAL (MHRD, Rs.75.00 Lakhs)
3. Aakash development laboratory at IIT Kharagpur (MHRD, Rs.0.00 Lakhs)
4. An Open Source Web Browser for Blind People (DIT, Govt. of India, Rs.29.94 Lakhs)
5. Anwesan: A Search engine for Bengali literary works (SNLTR, Rs.10.00 Lakhs)
6. Artificial Intelligence for Societal Needs (IIT, MHRD, Rs.0.00 Lakhs)
7. AUTOSAFE -- Architecture Aware Timing Analysis and Optimization of safety Critical Automotive Software (IGSTC, Rs.291.12 Lakhs)
8. Building Collaborative Download Framework for Wired and Wireless Networks (DST, Rs.42.00 Lakhs)
9. Building Reliable Embedded Real-Time Systems (DST-Indo Brazil Project, Rs.33.66 Lakhs)
10. Centre of Excellence in robotics (CEE) (SRIC, IIT KHARAGPUR, Sponsored Research & Industrial Consultancy, IIT Kharagpur, Rs.531.75 Lakhs)
11. Creating Accessible Study Materials for Print Impaired Students (MHRD, Rs.53.00 Lakhs)
12. Cross language information access Phase II (Ministry of Communications and Information Technology, Rs.138.73 Lakhs)
13. Decoding and exploring ancient classification of Indian music through machine learning method and audience response (MHRD, DEPARTMENT OF HIGHER EDUCATION, NEW DELHI, Rs.150.00 Lakhs)
14. Deployment of telemedicine project (II) - DOTP (WEBEL Electronic Communications Systems Ltd., Rs.0.00 Lakhs)
15. Design and Analysis of a Light Weight Cryptographic System on FPGAs (ISRO India, Rs.9.12 Lakhs)
16. Design and Analysis of Side Channel Attack Resistant Symmetric Key Cryptosystems (DIT, Govt of India, Rs.48.00 Lakhs)
17. Design and development of integrated security risk management for an enterprise network (Department of Information Technology, Govt of India, Rs.48.00 Lakhs)
18. Design and Efficient Implementation of Advanced Encryption and Decryption Techniques for Use in Spacecraft Communications (SAC Ahmedabad, ISRO KCSTC, Rs.19.80 Lakhs)
19. Design and Implementation of Scalable Parameterized Stream Cipher Well-suited for both software and Hardware (SAC Ahmedabad, (KCSTC IIT Kharagpur), Rs.18.60 Lakhs)
20. Design of an Integrated Scheme for Error Correction and Message Authentication, (SAC Ahmedabad, KCSTC IIT Kharagpur, Rs.12.00 Lakhs)
21. Design of Controller for Finite Field Arithmetic on FPGAs (completed) (Centre for Artificial Intelligence and Robotics (CAIR), Defence Research and Development Organisation, Rs.8.34 Lakhs)
22. Design of Finite Field Controller (CAIR DRDO, Rs.0.00 Lakhs)
23. Design of Side Channel Attack Resistant Programmable Block Ciphers on FPGAs (DIT India, Rs.73.20 Lakhs)

24. Development of Bangla Linux and Standardized Bangla Keyboard (Society for Natural Language Technology Research, Rs.7.50 Lakhs)
25. Development of Elliptic Curve Hardware Engine on Reconfigurable Platform (CAIR, DRDO, Bangalore, Rs.6.96 Lakhs)
26. Development of Web enabled e-Healthcare System for Neonatal Patient Care Services (eNPCS) (Department of Information Technology, Government of India, Rs.39.70 Lakhs)
27. Enhancing Cloud Efficiency through P2p Based Architecture (CSIR, Rs.24.00 Lakhs)
28. Evolving Communities and Information Spreading (Indo-French Center for the Promotion of Advanced Research, Rs.30.00 Lakhs)
29. Extending the Scope of Equivalence Checking in Complex Embedded System Design Verification (DST, Rs.840000.00 Lakhs)
30. Fault diagnosis in digital systems (under Synopsys CAD Lab) (Synopsys India, Rs.40.00 Lakhs)
31. GM Collaborative Research Laboratory on ECS for Education (General Motors, Rs.184.00 Lakhs)
32. GPU Based Multi-Temporal Implementation of Image Change Detection Algorithms and their Verification (ISRO, Rs.20.90 Lakhs)
33. Hardware Security: Ensuring TRUST in Integrated Circuits (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
34. ICT for computational social science (DST, Rs.1380000.00 Lakhs)
35. Image analysis for preservation and archiving of Indian Cultural Heritage (DST, Rs.23.00 Lakhs)
36. Indian Language Machine Translation Phase II (Ministry of Communications and Information Technology, Rs.40.00 Lakhs)
37. Integrated High-Level Synthesis to satisfy protocol and data processing specifications (DST, Rs.35.00 Lakhs)
38. Integrated Vehicle Health Management for Automotive Engine Applications (NPMASS, Rs.259.60 Lakhs)
39. Intel Embedded Innovation Lablet (Intel, Rs.12.00 Lakhs)
40. Investigation of Cryptanalytic Techniques (Headquarters, Integrated Defence Staff, Ministry of Defence, Govt of India, Rs.44.30 Lakhs)
41. J C Bose Fellowship (DST, Rs.0.00 Lakhs)
42. Leveraging Bipartite network to investigate the dynamical properties of sociotechnical systems (Samsung, Rs.40.00 Lakhs)
43. Leveraging Simulation Dumps and Failure Traces for Formal Property Verification (INTEL Technology India Pvt. Ltd, Bangalore, Rs.10.00 Lakhs)
44. Linux kernel development and support (Nucleodyne Systems Inc., USA, Rs.12.00 Lakhs)
45. MACHINE LEARNING BASED MODEL BUILDING ATTACKS ON PUFs (DRDO CAIR Bangalore, Rs.9.60 Lakhs)
46. Machine Learning based Model-building Attack on PUFs (Centre for Artificial Intelligence and Robotics (CAIR), Defence Research and Development Organisation, Rs.9.60 Lakhs)
47. Modelling and validation of interlocking for railway signalling systems (RDSO (Indian Railways), Rs.34.61 Lakhs)
48. Modelling and validation of interlocking for railway signalling systems (RDSO, Rs.34.61 Lakhs)
49. NAHIR: Not so Ad-Hoc Information Retrieval (ISIRD, Rs.5.00 Lakhs)
50. New perspectives for computational social science (DST, India and Ministry of External Affairs, Italy, Rs.2.00 Lakhs)
51. NSF TCPP Early-Adopter Award (NSF, US, Rs.1.30 Lakhs)
52. Pattern Recognition Algorithms for Bioinformatics (DST, Rs.24.50 Lakhs)
53. Post-disaster situation analysis and resource management using delay-tolerant peer-to-peer wireless networks (ITRA, DIT, Rs.89.00 Lakhs)
54. POWER ATTACKS ON STREAM CIPHERS AND CACHE MEMORY ATTACKS (DRDO New Delhi, Rs.45.00 Lakhs)

55. Power Attacks on Stream Ciphers and Cache Memory Attacks (Scientific Analysis Group, New Delhi, India, Rs.45.00 Lakhs)
56. Predicting cancer treatment outcomes of lung and colorectal cancer by modeling and analysis of anatomic and metabolic images (MHRD Granted Project under "Signals and Systems for Life Science (SSLS)", Rs.18.00 Lakhs)
57. Predictive Docking: Improving the Performance by Refining Protein Structures (Institute Scheme for Innovative R & D (IIT, Kharagpur), Rs.28.00 Lakhs)
58. Preprocessing and Analysis of Degraded Documents (MCT, GOI, Rs.34.00 Lakhs)
59. Programming and Data Structures Virtual Lab (MHRD, Rs.20.00 Lakhs)
60. Protein Interactor Discovery and Structure (Indo-US Science and Technology Forum (IUSSTF), Rs.0.00 Lakhs)
61. Regression Testing of Object-Oriented Programs (DST, New Delhi, Rs.10.54 Lakhs)
62. Safety messaging in vehicular networks (General Motors India, Rs.0.00 Lakhs)
63. SocioWeb: Social computation to enhance Web and network applications (ISIRD, SRIC IIT Kharagpur, Rs.5.00 Lakhs)
64. software Tools for Cryptanalysis of Stream Cipher (SAG, DRDO, New Delhi, Rs.19.85 Lakhs)
65. Special Manpower Development Project (DIT, Rs.90.00 Lakhs)
66. Speech Based Computer Interface (Intel, Rs.10.00 Lakhs)
67. Static Analysis Based Partitioning Techniques for GPGPU Programs (ISIRD Grant, SRIC IIT Kharagpur, Rs.5.00 Lakhs)
68. Strategies for power reduction during VLSI circuit testing (DIT, Government of India, Rs.31.00 Lakhs)
69. Study of Hardware Malware Vulnerabilities and Mitigation Techniques for FPGAs (CAIR DRDO, Rs.9.00 Lakhs)
70. Theoretical and Experimental Analysis of the Dynamics on Interdependent Networks (ISIRD grant, IIT Kharagpur, Rs.5.00 Lakhs)
71. TO DEVELOP A SCIENTIFIC RATIONALE OF IELS (INDO-EUROPEAN LANGUAGE SYSTEMS) APPLYING A) COMPUTATIONAL LINGUISTICS & B) COGNITIVE GEO-SPATIAL MAPPING AP (MHRD, Rs.100.00 Lakhs)
72. Understanding, Leveraging and Deploying Online Social Networks (DST-IMPECS, Rs.60.00 Lakhs)
73. Unraveling Cancer transformation and progression through biological, electro-mechanical and computational techniques (, Rs.38.00 Lakhs)
74. Virtual Lab (VLS) on Computer Organization (MHRD, Rs.30.00 Lakhs)
75. Virtual Lab for Computer Organisation & Architecture (MHRD, Rs.56.00 Lakhs)
76. VLSI Design of Elliptic Curve Cryptosystem tolerant Against Power Attacks (SRIC, IIT Kharagpur, Rs.4.40 Lakhs)
77. Whole Cell Modeling and Simulation in Bacterium Escherichia Coli (Open Competitive Grand Challenge Seed Grants (SGIGC) of IIT, Kharagpur, Rs.250.00 Lakhs)

### ***Consultancy Projects***

1. Analytics of Group Dynamics of Mobile Users (Xerox Corporation, Rs.79.20 Lakhs)
2. Approaches to Efficient & Safe C++ Generic Programming Interface for a Legacy C Library – Phase II - ESCP [Jul, 2012-Jun, 2013] (Interra Systems India Private Limited, Rs.7.02 Lakhs)
3. Architecture and Algorithmic Optimizations for Speech based Communication Interfaces on Mobile Devices (57.00 Lakhs) (Intel Corporation, Rs.57.00 Lakhs)
4. Core Banking Systems Implementation ( Orissa State Cooperative Bank Ltd., Bhubaneswar, Rs.56.25 Lakhs)
5. Drafting Revised Guidelines for UG Engineering Program Accreditation (NBA, Rs.0.00 Lakhs)

6. Formal Equivalence and Simulation Relations for AMS Behavioral Models (Semiconductor Research Corporation, USA, Rs.45.00 Lakhs)
7. Formal methods for power intent verification (MPIV) (Synopsys (India) Pvt. Limited, RMZ Infinity, Tower A, Old Madras Road, Bangalore-560016, Rs.25.00 Lakhs)
8. Formal Verification of Post Silicon Bug Fixes (INTEL Technology India Pvt. Ltd, Bangalore, Rs.22.06 Lakhs)
9. GM Collaborative Research Laboratory on Electronics, Controls and Software: Projects (General Motors, Rs.425.00 Lakhs)
10. HARDWARE TROJAN ATTACK TEST BED ON FPGA BASED SYSTEMS (Reconnoiter Technology & Research Pvt. Ltd, Rs.20.00 Lakhs)
11. Hardware Trojan Attack Testbed on FPGA based Systems (Reconnoiter Technology and Research, Pune, India, Rs.20.00 Lakhs)
12. IT Consultancy (CITM) (UCO Bank, Rs.15.00 Lakhs)
13. IT Consultant at NIC (National Insurance Company Limited, Rs.3.12 Lakhs)
14. Platform Architecture Modeling for Exploring Power Management Strategies (Intel, Rs.16.00 Lakhs)
15. Roadmap for ERP Solutions at Kolkata Port Trust (Kolkata Port Trust, Rs.4.50 Lakhs)
16. Sanyog Phase II: A portable communication Tool for the Speech & Neuro Motor Impaired People (Media Lab Asia, New Delhi, Rs.71.12 Lakhs)
17. SIDE-CHANNEL ATTACK (SCA) EVALUATION OF PSEC-KEM (NTT Labs Japan, Rs.14.20 Lakhs)
18. Synopsys CAD Laboratory (Synopsys, Rs.172.72 Lakhs)
19. Technical Consultancy Services on IT Matters (UCO Bank, Kolkata, Rs.6.00 Lakhs)

#### ***Patents (filed / granted)***

1. A cache Timing Attack resistant Prefetching Architecture
2. A Two-Pulse Synthesis (TPS) Based Method and System for DVP Signal Analysis
3. Architecture specific high-speed block cipher implementation
4. Feature point based brain atlas generation and diagnosis of Alzheimer disease
5. Method and Apparatus for Extracting Assume Properties
6. Method and Apparatus for Operational-Level Functional and Degradation Fault Analysis
7. MULTI-LEVEL INLINE DATA DEDUPLICATION
8. PROTECTION OF INTELLECTUAL PROPERTY (IP) CORES THROUGH A DESIGN FLOW
9. Shruti: Vernacular Speech Recognition System in Bengali
10. T. Acharya, B. B. Bhattacharya, P. Bhowmick, A. Bishnu, A. Biswas, M. K. Kundu, Method and Apparatus for Providing a Binary Fingerprint Image
11. T. Acharya, B. B. Bhattacharya, P. Bhowmick, A. Bishnu, J. Dey, M. K. Kundu and C. A. Murthy, Method and apparatus to reduce false minutiae from a binary fingerprint image
12. T. Acharya, B. B. Bhattacharya, P. Bhowmick, A. Bishnu, J. Dey, M. K. Kundu, and C. A. Murthy, Architecture for Processing Fingerprint Images
13. VENUCAINE: An Electronic Travel Aid for Visually Impaired and Blind People,

#### **Visits Abroad by Faculty Members**

1. Majumder, Arun Kumar - To participate in Technology Exchange Program at Oracle (Redwood Shores, California, U.S.A., ) November 13-15, 2013
2. Mitra, Bivas - Organizer, Dynamics on and of Complex Networks VI (DOOCN 2013), A satellite workshop of ECCS 2013 (Barcelona, Spain, ) September 2013
3. Mitra, Bivas - Invited Speaker, Dynamic Information and Communication Networks 2013, Workshop of NetSci 2013 (Copenhagen, Denmark, ) June 2013
4. Sarkar, Sudeshna - Present paper at ICDM 2013 (Dallas, Texas USA, ) Dec 7-10, 2013

5. Sarkar, Sudeshna - Collaboration with Northeastern University, USA (Boston, USA, ) 14-16 December, 2013
6. Bhowmick, Partha - 9th International Symposium on Visual Computing (ISVC 2013) (Crete, Greece, ) July 29-31, 2013

### **Invited Lectures by Faculty Members**

1. Corpus based suggestion for query expansion and reformulation *by* Sarkar, Sudeshna (TCS, Delhi)
2. Machine Learning for Recommender Systems *by* Sarkar, Sudeshna (IIT Kanpur, 1st Indian Workshop on Machine Learning)
3. Climate Mining at IIT Kharagpur *by* Sarkar, Sudeshna (Northeastern University)
4. Introduction to Hybrid Systems *by* Dey, Soumyajit (ISI Kolkata)
5. Formal Methods for Embedded System Design *by* Dey, Soumyajit (Jadavpur University)
6. Communities in Time Varying Networks *by* Mitra, Bivas (IIT Kanpur)
7. Dynamics in Complex Networks: From Interdependence to Community Evolution *by* Mitra, Bivas (IIT Jodhpur)
8. Optimizing the Usage of Mobile Device and Networking *by* Mitra, Bivas (NIT Durgapur)
9. Dynamic Community Detection and Analysis *by* Mitra, Bivas (Bengal Engineering & Science University, Shibpur)
10. Opensource Software *by* Mandal, Chittaranjan (IIT Library, workshop on opensource software)
11. Understanding the Emergence of Superpeer Networks: A Complex Network Approach *by* Mitra, Bivas (Copenhagen, Denmark)
12. Equivalence checking of programs *by* Mandal, Chittaranjan (Sir C R Reddy College of Engineering)
13. Computational Perspectives of Protein Interactions *by* Mitra, Pralay (Indo-Brazil Workshop on Biomedical Informatics, Indian Institute of Technology, Kharagpur, India)
14. Algorithmic Techniques for Modeling *by* Mitra, Pralay (Emerging Research Trends in Data Mining For Bioinformatics, AU College of Engineering, Andhra University, India)
15. Extraction of Contextual Information from Echo-Cardiogram Video *by* Mukhopadhyay, Jayanta ( Govt. Engg. College, Kalyani)
16. Information processing for Neonatal Health Care *by* Mukhopadhyay, Jayanta (ICACCI, Mysore)
17. Science, Rationality and an Individual *by* Mukhopadhyay, Jayanta (Bengal Engineering and Science University, Shibpur)
18. Digital repainting of heritage murals *by* Mukhopadhyay, Jayanta (Indian Statistical Institute)
19. Use of semi-definite programming in the design of approximation algorithms *by* Pal, Sudebkumar Prasant (NIT Durgapur, Department of Mathematics)
20. Applications of Lovasz local lemma *by* Pal, Sudebkumar Prasant (Department of Mathematics, IIT Delhi)
21. Multi-Threaded Programming in C++ *by* Das, Partha Pratim (Interra Systems (India) Pvt. Ltd., Noida)
22. “Prosaran” Lecture on “Kinectic Vision – Looking Deep into Depth” *by* Das, Partha Pratim (B. P. Poddar Institute of Management & Technology, Kolkata)
23. Overview of C++11: New C++ Standard *by* Das, Partha Pratim (Interra Systems (India) Pvt. Ltd., Noida)
24. Tutorial on “Kinectic Vision – Looking Deep into Depth” *by* Das, Partha Pratim (NCVPRIPG 2013: Fourth National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics, IIT, Jodhpur)
25. Software Engineering: UML, Design Patterns *by* Das, Partha Pratim (Interra Systems (India) Pvt. Ltd., Noida)
26. Software Engineering: C++11 *by* Das, Partha Pratim (Interra Systems (India) Pvt. Ltd., Noida)

27. Customer Management – Effective Communication, and Customer Orientation *by* Das, Partha Pratim (Interra Systems (India) Pvt. Ltd., Noida)
28. Keynote Presentation on “NUI Revolution – The Visual Perspective” *by* Das, Partha Pratim (ETCC 2014: National Conference on Emerging Trends in Computing & Communication, Department of Information Technology of B. P. Poddar Institute of Management & Technology, Kolkata)
29. Difference of Practical and Theoretical Cryptanalysis *by* Roychowdhury, Dipanwita (NTRO, New Delhi)

### ***Books Published***

1. Abhijit Das: Computational Number Theory *published by* Taylor and Francis / CRC (2013)
2. J. Mukhopadhyay, P. Bhowmick, P. P. Das, S. Chattopadhyay, and B. N. Chatterji: Digital Geometry in Image Processing *published by* CRC Press (2013)
3. Mukherjee, A. Choudhury, M. Peruani, F. Ganguly, N. Mitra, B. (Eds.): Dynamics On and Of Complex Networks, Volume 2, Applications to Time-Varying Dynamical Systems *published by* Birkhauser, Springer (2013)
4. Soumya Pandit, Chittaranjan Mandal, Amit Patra: Nano-scale CMOS Analog Circuits: Models and CAD Techniques for High-Level Design *published by* CRC Press (2013)
5. Sudip Roy and Ajit Pal: Impact of Leakage Power Reduction on Parametric Yield *published by* LAP LAMBERT Academic Publishers (2013)
6. Thampi, M. Sabu M., A. Gelbukh, and J. Mukhopadhyay (Ed.): Advances in Signal Processing and Intelligent Recognition Systems *published by* Springer (2014)

### ***Short-Term Courses, Training Programmes and Workshops organised***

1. Computational Biology, Bioinformatics & Their Application to Healthcare (October 28, 2013 - November 1, 2013)
2. Computational Systems Biology (March 31, 2014 - April 04, 2014)
3. Data Mining and Image Analytics for Medical Informatics (8th April 2013 to 12th April 2013)

### ***Papers Published in Journals***

1. Verification of Loop and Arithmetic Transformations of Array-Intensive Behaviors *By* C. Karfa, K Banerjee, D. Sarkar and C. Mandal *IEEE Trans. on CAD of Integrated Circuits and Systems* 32(11) 1787-1800 (2013)
2. A Context based Word Indexing Model for Document Summarization *By* Pawan Goyal, Laxmidhar Behera and TM McGinnity *IEEE Transactions on Knowledge and Data Engineering* Vol. 25 No. 8 (2013)
3. A Dependency Annotation Scheme for Bangla Treebank *By* Sanjay Chatterji, Tanaya Mukherjee Sarkar, Pragati Dhang, Samhita Deb, Sudeshan Sarkar, Jayshree Chakraborty, Anupam Basu *Language Resources and Evaluation* (0)
4. A framework for web based geographical information system for country wide antimicrobial resistance monitoring *By* B.K. Arya, D. Robert, S. Das Bhattacharya, and J. Mukhopadhyay *Health Policy and Technology* 2(2), 85-93 (2013)
5. A Fuzzy Real Time Temporal Logic *By* Subhankar Mukherjee, P. Dasgupta *International Journal on Approximate Reasoning*, 54(9) (2013)
6. A Kleene Algebra of Tagged System Actors for Reasoning about Heterogeneous Embedded Systems. *By* S. DE, D. Sarkar A. Basu *IEEE Trans on Computers* 62(10) 1917 - 1931 (2013)
7. A metric for test set characterization and customization towards fault diagnosis *By* Subhadip Kundu, Sankhadeep Pal, Santanu Chattopadhyay, Indranil Sen Gupta, and Rohit Kapur *IEEE*



- Transactions on Computer-Aided Design of Integrated Circuits and Systems* 32(11):1824-1828 (2013)
8. A Novel Approach for Efficient Extrication of Overlapping Chromosomes in Automated Karyotyping By M. Munot, J. Mukherjee, and M. Joshi *Medical and Biological Engineering & Computing* 51(12), 1325-1338 (2013)
  9. A post-synthesis optimization technique for reversible circuits exploiting negative control lines By K. Datta, I. Sengupta, and H. Rahaman *IEEE Transactions on Computers* To appear (2014)
  10. A Quantitative Route to the Rise and Fall of Scientific Research By Chakraborty, T., Sikdar, S., Ganguly, N. and Mukherjee, A. *Journal of Social Network Analysis and Mining* 4:187 (2014)
  11. A regression test selection technique for embedded software By Swarnendu Biswas, Rajib Mall, Manoranjan Satpathy *ACM Transactions on Embedded Computer Systems* 13(3): 47 (2013)
  12. An evolution-based approach to de novo protein design and case study on Mycobacterium Tuberculosis By Pralay Mitra, David Shultis, Jeffrey R Brender, Jeff Czajka, David Marsh, Felicia Gray, Tomasz Cierpicki, Yang Zhang *PLoS Computational Biology* 9(10):e1003298 (2013)
  13. An Integrated Approach for Fine-Grained Power and Temperature Management During High-level Synthesis By Rajdeep Mukherjee, Priyankar Ghosh, Pallab Dasgupta and Ajit Pal *Journal of Low Power Electronics* 9 (3) (2013)
  14. Assisted-Leach (A-Leach): Energy Efficient Routing Protocol for Wireless Sensor Networks By Sunkara Vinodh Kumar and Ajit Pal *International Journal of Computer and Communication Engineering* Vol. 2, No.4 (2013)
  15. Automatic code generation from unified modelling language sequence diagrams By Debasish Kundu, Debasis Samanta, Rajib Mall *IET Software* 7(1): 12-28 (2013)
  16. CAR30: A new scalable stream cipher with rule 30 By Sourav Das, Dipanwita Roy Chowdhury *Cryptography and Communications* 5(2): 137-162 (2013)
  17. Characterizations of Noise in Kinect Depth Images By Tanwi Mallick, Partha Pratim Das and Arun Kumar Majumdar *IEEE Sensors Journal* (2014)
  18. Constrained search for a class of good bijective S-boxes with improved DPA resistivity By B. Mazumdar, D. Mukhopadhyay and I. Sen Gupta *IEEE Transactions on Information Forensics and Security* 8(12):2154-2163 (2013)
  19. Counterexample Ranking Using Mined Invariants By Srobona Mitra, Ansuman Banerjee, Pallab Dasgupta and Harish Kumar *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems* 32 (12) (2013)
  20. Cryptosystem for secret sharing scheme with hierarchical groups By Atanu Basu, Indranil Sen Gupta, Jamuna Kant Sing *International Journal of Network Security* 15(6):455-464 (2013)
  21. Detection of Artifacts from High Energy Bursts in Neonatal EEG By S. Bhattacharyya, A. Biswas, J. Mukherjee, A.K. Majumdar, B. Majumdar, S. Mukherjee, A.K. Singh *Computers in Biology and Medicine* 43(11), 1804-1814 (2013)
  22. Diffuse Reflection Diameter and Radius for Convex-Quadrilateralizable Polygons By Arindam Khan, Sudebkumar Prasant Pal, Mridul Aanjaneya, Arijit Bishnu and Subhas C. Nandy, *Discrete Applied Mathematics* 161(10-11) 1496-1505 (2013)
  23. EvoDesign: de novo protein design based on structural and evolutionary profiles By Pralay Mitra, David Shultis, Yang Zhang *Nucleic Acids Research* 41:W273-W280 (2013)
  24. Fast Circular Arc Segmentation Based on Approximate Circularity and Cuboid Graph By P. Bhowmick and S. Pal. *Journal of Mathematical Imaging and Vision* 49, pp. 98-122 (2014)
  25. First-order DPA Vulnerability of Rijndael: Security and Area-delay Optimization Trade-off. By Monjur Alam, Santosh Ghosh, Dipanwita Roy Chowdhury, Indranil Sengupt *International Journal of Network Security* 15(3): 219-230 (2013)
  26. Formal Guarantees for Localized Bug Fixes By Srobona Mitra, Ansuman Banerjee, Pallab Dasgupta, Priyankar Ghosh, Harish Kumar *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems* 32 (8) (2013)

27. Framework for multiple-fault diagnosis based on multiple fault simulation using particle swarm optimization *By* S. Kundu, A. Jha, S. Chattopadhyay, I. Sen Gupta and R. Kapur *IEEE Transactions on VLSI systems* 22(3):696-700 (2014)
28. Incremental Beam Search *By* S G Vadlamudi, S Aine, P P Chakrabarti *Information processing Letters* 113 (22-24):888-893 (2013)
29. Intergroup networks as random threshold graphs *By* Saha, S., Ganguly, N., Mukherjee, A. and Krueger, T. *Phys. Rev. E* 89, 042812. (2014)
30. Linear combination of norms in improving approximation of Euclidean norm *By* J. Mukherjee *Pattern Recognition Letters* 34(12): 1348-1355 (2013)
31. Linear combination of weighted t-cost and chamfering weighted distances *By* J. Mukherjee *Pattern Recognition Letters* 40, 72-79 (2014)
32. Lower bounds for Ramsey numbers for complete bipartite and 3-uniform tripartite subgraphs *By* Tapas Kumar Mishra and Sudebkumar Prasant Pal *Journal of Graph Algorithms and Applications* 17, 671-688 (2013)
33. On covering a digital disc with concentric circles in  $Z^2$  *By* S. Bera, P. Bhowmick, P. Stelldinger, and B. B. Bhattacharya. *Theoretical Computer Science* 506, pp. 1-16 (2013)
34. Partial encryption and watermarking for audio files with controlled degradation in quality *By* K. Datta and I. Sen Gupta *Multimedia Tools and Applications* 64(3):649-669 (2013)
35. Pixel rearrangement based statistical restoration scheme reducing embedding noise *By* A. Sur, R. Vignesh, and J. Mukherjee *Multimedia Tools and Applications* 68(3), 805-825 (2014)
36. Pose Depth Volume Extraction from RGB-D Streams for Frontal Gait Recognition *By* P. Chattopadhyay, A. Roy, S. Sural, and J. Mukhopadhyay *Journal of Visual Communication and Image Representation* 25(1), 53-63 (2014)
37. POWER-TRUCTOR: An Integrated Tool Flow for Formal Verification and Coverage of Architectural Power Intent *By* Aritra Hazra, Rajdeep Mukherjee, Pallab Dasgupta, Ajit Pal, Kevin Harer, Ansuman Banerjee, Subhankar Mukherjee *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems* 32 (11) (2013)
38. PSO based reversible circuit synthesis using mixed control Toffoli gates *By* Kamalika Datta, Indranil Sen Gupta, and Hafizur Rahaman *Journal of Low Power Electronics (JOLPE)* 9(3):363-372 (2013)
39. Rain: Reversible Addition with Increased Nonlinearity. *By* Jaydeb Bhaumik, Debdeep Mukhopadhyay, Dipanwita Roy Chowdhury *I. J. Network Security* 15(4): 298-306 (2013)
40. Recognition of Bangla compound characters using structural decomposition. *By* S. Bag, G. Harit, and P. Bhowmick. *Pattern Recognition* 47, pp. 1187-1201 (2014)
41. Reliability Guarantees in Automata Based Scheduling for Embedded Control Software *By* Santhosh Prabhu M, Aritra Hazra and Pallab Dasgupta *IEEE Embedded Systems Letters* 5 (2) (2013)
42. Robustness Analysis of Embedded Control Systems with respect to Signal Perturbations: Finding Minimal Counterexamples using Fault Injection *By* S G Vadlamudi, P P Chakrabarti *IEEE Transactions on Dependable and Secure Computing* 119(1), pp 48-58 (2014)
43. Secure Dual-Core Cryptoprocessor for Pairings Over Barreto-Naehrig Curves on FPGA Platform *By* Santosh Ghosh, Debdeep Mukhopadhyay, Dipanwita Roy Chowdhury *IEEE Trans. VLSI Systems* 21(3): 434-442 (2013)
44. Skew Correction of Document Images by Rank Analysis in Farey Sequence *By* S. Pratihar, P. Bhowmick, S. Sural, and J. Mukhopadhyay. *International Journal of Pattern Recognition and Artificial Intelligence* 27(7), 35 pages (2013)
45. Time-Budgeting: A Component Based Development Methodology for Real-time Embedded Systems *By* Manoj Dixit, S.Ramesh and Pallab Dasgupta, *Formal Aspects of Computing* (2013)
46. Verification of Code Motion Techniques using Value Propagation *By* Kunal Banerjee, Chandan Karfa, Dipankar Sarkar, Chittaranjan Mandal *IEEE Transactions on CAD* Accepted (2014)

47. Verification of Loop and Arithmetic Transformations of Array-Intensive Behaviours By Chandan Karfa, Kunal Banerjee, Dipankar Sarkar, Chittaranjan Mandal *IEEE Transactions on CAD* pp 1787--1800, vol 3 (2013)

### ***Papers Presented in Conferences***

1. Design and Implementation of Rotation Symmetric S-boxes with High Nonlinearity and High DPA Resilience, By Bodhisattwa Majumdar, Debdeep Mukhopadhyay, Indranil Sengupta, *Hardware Security and Oriented Trust (HOST)*, Texas USA, (2013)
2. Differential Fault Analysis of MICKEY-128 2.0., By Sandip Karmakar, Dipanwita Roy Chowdhury, *FDTC 2013*, Santa Barbara, CA, USA, (2013)
3. Leakage Squeezing Using Cellular Automata, By Sandip Karmakar, Dipanwita Roy Chowdhury, *AUTOMATA 2013*, Gießen, Germany, (2013)
4. (Stable) Virtual Landmarks: Spatial Dropbox to enhance Retail Experience, By Swadhin Pradhan, Ananth Balashankar, Niloy Ganguly, Bivas Mitra, *IEEE COMSNETS*, Bangalore, (2014)
5. A Distributed Greedy Algorithm for Construction of Minimum Connected Dominating Set in Wireless Sensor Network, By Jasaswi Prasad Mohanty, Chittaranjan Mandal, *Applications and Innovations in Mobile Computing (AIMoC 2014)*, Calcutta, India, (2014)
6. A Mobility Simulation Framework Of Humans With Group Behavior Modeling, By Anshul Gupta, Aurosish Mishra, S. G. Vadlamudi, P. P. Chakrabarti, Sudeshna Sarkar, Tridib Mukherjee, Nathan Gnanasambandam, , *IEEE 13th International Conference on Data Mining (ICDM)*, Dallas USA, (2013)
7. A Pseudo-Relevance Feedback Based Method to Find Comprehensive Web Documents, By Rajendra Prasath, Sudeshna Sarkar, *Advances in Artificial Intelligence and its applications, Proceedings MICAI 2013*, Mexico city, Mexico, (2013)
8. Acceptance and Random Generation of Event Sequences under Real Time Calculus constraints, By Kajori Banerjee, Pallab Dasgupta, *Design Automation and Test in Europe*, Dresden, Germany, (2014)
9. Algorithms for Generating Ordered Solutions for Explicit AND/OR Structures, By Priyanka Ghosh, Amit Sharma, P. P. Chakrabarti, Pallab Dasgupta, *Int. Joint Conference on Artificial Intelligence (IJCAI)*, Beijing, China, (2013)
10. An approach to solve tracking and message blocking problems in RFID, By Subhasish Dhal, Ajay Kant Singh and Indranil Sen Gupta, *4th International Conference on Communications Security and Information Assurance (CSIA)*, New Delhi, India, (2013)
11. An ATE assisted DFD technique for volume diagnosis of scan chains, By Subhadip Kundu, Santanu Chattopadhyay, Indranil Sen Gupta and Rohit Kapur, *50th Design Automation Conference*, Austin, TX, USA, (2013)
12. An improved reversible circuit synthesis approach using clustering of ESOP cubes, By Kamalika Datta, Gaurav Rathi, Indranil Sen Gupta and Hafizur Rahaman, *10th Reed-Muller Workshop*, Toyoma, Japan, (2013)
13. Analysis and modeling of lowest unique bid auctions., By Chakraborty, T., Tammana, V., Ganguly, N. and Mukherjee, A., *ASE Socialcom*, Stanford, USA, (2014)
14. Anytime Contract Search, By Sunandita Patra, S. G. Vadlamudi, P. P. Chakrabarti, *BCS SGAI 33rd International Conference on Artificial Intelligence (AI)*, Cambridge England, (2013)
15. Anytime Pack Search, By S. G. Vadlamudi, Sandip Aine, P. P. Chakrabarti, *5th International Conference on Pattern Recognition and Machine Intelligence (PREMI)*, Kolkata, (2013)
16. Applications of reversible logic in cryptography and coding theory, By Kamalika Datta and Indranil Sen Gupta, *26th International Conference on VLSI Design*, Pune, India, (2013)
17. Automatic Classification and Analysis of Interdisciplinary Fields in Computer Sciences, By Chakraborty, T., Kumar, S., Reddy, M. D., Kumar, S., Ganguly, N. and Mukherjee, A., *ASE/IEEE Socialcom*, Washington DC, (2013)

18. Colored Rubber Stamp Removal from Document Images, *By* S. Dey, J. Mukherjee, S. Sural, S., and P. Bhowmick,, *5th Int. Conf. on Pattern Recognition and Machine Intelligence (PREMI-2014)*, Kolkata, India, (2013)
19. Computer Science Fields as Ground-truth Communities: Their Impact, Rise and Fall, *By* Chakraborty, T., Sikdar, S., Tammana, V., Ganguly, N. and Mukherjee, A., *IEEE/ACM ASONAM*, Niagara Falls, Canada, (2013)
20. Converting Constituency Structures to Dependency Structures for Sanskrit: Linguistic Issues, *By* Pawan Goyal and Amba Kulkarni, *30th Round Table of South Asian Language Analysis*, University of Hyderabad, INDIA, (2014)
21. Design and implementation of rotation symmetric S-boxes with high nonlinearity and high DPA resilience, *By* Bodhisatwa Mazumdar, Debdeep Mukhopadhyay and Indranil Sen Gupta, *6th International Symposium on Hardware-Oriented Security and Trust (HOST)*, Austin, TX, USA, (2013)
22. Design of a lean interface for Sanskrit corpus annotation, *By* Gérard Huet and Pawan Goyal, *ICON*, New Delhi, INDIA, (2013)
23. Designing DPA Resistant Circuits Using BDD Architecture and Bottom Pre-charge Logic, *By* Partha De, Kunal Banerjee, Chittaranjan Mandal, Debdeep Mukhopadhyay, *16th Euromicro Conference on Digital System Design (DSD)*, Santander, Joaquín Costa, Spain, (2013)
24. Determining the User Intent Behind Web Search Queries by Learning from Past User Interactions with Search Results, *By* Ariyam Das, Chittaranjan Mandal, Chris Reade, *19th International Conference on Management of Data (COMAD 2013)*, Ahmedabad, (2013)
25. Effect of Constraints on Superpeer Topologies, *By* Joydeep Chandra, Bivas Mitra and Niloy Ganguly, *IEEE INFOCOM*, Turin, Italy, (2013)
26. Effectiveness of Test-Driven Development as an SDLC Model: A Case Study of an Elevator Controller Design, *By* Sayani Mondal and Partha Pratim Das, *ETCC 2014 – Emerging Trends in Computing and Communication (Lecture Notes in Electrical Engineering 298)*, Kolkata, India, (2014)
27. Estimation of the orientation and distance of a mirror from Kinect depth data, *By* Tanwi Mallick, Partha Pratim Das and Arun Kumar Majumdar, *NCVPRIPG 2013 – Fourth National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics*, Jodhpur, India, (2014)
28. Estimation of the orientation and distance of a mirror from Kinect depth data, *By* Tanwi Mullick, P.P. Das and A. K. Majumdar, *National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics*, Jodhpur, (2013)
29. Estimation, Characterization and Control of Interference Noise in a Multi-Kinect Imaging Set-up, *By* Tanwi Mullick, P.P. Das and A. K. Majumdar, *International Conference on Computer Vision Theory and Applications (VISAPP 2014)*, Lisbon, Portugal, (2014)
30. Experimentation with SMT Solvers and Theorem Provers for Verification of Loop and Arithmetic Transformations, *By* Chandan Karfa, Kunal Banerjee, Dipankar Sarkar, Chittaranjan Mandal, *I-CARE 2013*, IIT Delhi, (2013)
31. Exploiting negative control lines in the optimization of reversible circuits, *By* Kamalika Datta, Gaurav Rathi, Robert Wille, Indranil Sen Gupta, Hafizur Rahaman and Rolf Drechsler, *5th International Conference on Reversible Computing*, Victoria, Canada, (2013)
32. Gait Recognition from Front and Back View Sequences Captured Using Kinect, *By* P. Chattopadhyay,, S. Sural, and J. Mukherjee,, *5th Int. Conf. on Pattern Recognition and Machine Intelligence (PREMI-2014)*, Kolkata, India, (2013)
33. Global Routing using Monotone Staircases with Minimal Bends, *By* Bapi Kar, Susmita Sur-Kolay, Chittaranjan Mandal, *IEEE International Conference on VLSI Design*, IIT Bombay, (2014)
34. GPU-based Implementation of 128-bit Secure Eta Pairing Over a Binary Field, *By* Utsab Bose, Anup Kumar Bhattacharya and Abhijit Das, *AfricaCrypt 2013*, Cairo, Egypt, (2013)

35. Handling Fault Detection Latencies in Automata-based Scheduling for Embedded Control Software, *By* Santhosh Prabhu M, Aritra Hazra, Pallab Dasgupta and P. P. Chakrabarti, *IEEE Multi-Conference on Systems and Control*, India, (2013)
36. Image Deblocking by Transcoding DCT Blocks to Wavelet Subbands, *By* K. Viswanath, J. Mukhopadhyay, and P.K. Biswas., *8th International Symposium on Image and Signal Processing and Analysis (ISPA 2013)*, Trieste, Italy, (2013)
37. Improved Histogram Bin Shifting based Reversible Watermarking, *By* P. Nagaraju, R. Naskar and R. S. Chakraborty, *International Conference on Intelligent System and Signal Processing (ISSP)*, Anand, Gujarat, India, (2013)
38. Infant cry recognition using excitation source features, *By* A.K. Singh, J. Mukhopadhyay, S.B.S. Kumar, and K.S. Rao, *Annual IEEE India Conference (INDICON)*, Mumbai, India, (2013)
39. Large Web Corpora of High Quality for Indian Languages, *By* Uwe Quasthoff, Ritwik Mitra, Sunny Mitra, Thomas Eckart, Dirk Goldhahn, Pawan Goyal and Animesh Mukherjee, *LREC Workshop on Indian Language Data: Resources and Evaluation*, Reykjavik, Iceland, (2014)
40. Lightweight Cipher Implementations on Embedded Processors, *By* Sagar Khurana, Souvik Kolay, Chester Rebeiro and Debdeep Mukhopadhyay, *DTIS*, Abu Dhabi, (2013)
41. Model Building attacks on Physically Unclonable Functions using Genetic Programming (short paper), *By* I. Saha, R. R. Jeldi and R. S. Chakraborty, *IEEE International Symposium on Hardware-Oriented Security and Trust (HOST)*, Austin, Texas, USA, (2013)
42. Multimode Sampling Period Selection for Embedded Real Time Control, *By* Rajorsheeraha, Soumyajit Dey, Pallab Dasgupta, P. P. Chakraborty, *Design Automation Conference (accepted as a work in progress)*, Sanfrancisco, CA, USA, (2014)
43. Opinion dynamics in correlated time-varying social networks., *By* Maity, S. K., Manoj, T. V. and Mukherjee, A., *ASE Socialcom*, Stanford, USA, (2014)
44. Ordered Solution Generation for Implicit AND/OR Search Spaces, *By* Priyanka Ghosh, P P Chakrabarti, Pallab Dasgupta., *5th International Conference on Pattern Recognition and Machine Intelligence (PReMI)*, Kolkata, (2013)
45. Parallel-Distributed Software Implementation of Buchberger Algorithm., *By* Praloy Biswas and Dipanwita Roy Chowdhury., *WASET 2013*, Barcelona, Spain, (2013)
46. Psychovisual Saliency in Color Images, *By* S. Gupta, R. Agrawal, R. Layek, J. Mukhopadhyay, *National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics (NCVPRIPG)*, Jodhpur, India, (2013)
47. Query Expansion Using PRF-CBD Approach for Documents Retrieval, *By* Rajendra Prasath, Sudeshna Sarkar, *5th International Conference on Pattern Recognition and Machine Intelligence*, ISI Kolkata, (2013)
48. Re-targeting of multi-script document images for handheld devices, *By* S. Dey, J. Mukhopadhyay, S. Sural and P. Bhowmick, *4th International Workshop on Multilingual OCR (MOCR-2013)*, Washington, DC, USA, (2013)
49. Re-using Refresh for Self-testing DRAMs, *By* Bibhas Ghoshal, Chittaranjan Mandal, Indranil Sengupta, *ISED 2013*, NTU, Singapore, (2013)
50. Removal of Hand-drawn Annotation Lines from Document Images by Digital-geometric Analysis and Inpainting, *By* S. Pratihar, P. Bhowmick, S. Sural, and J. Mukherjee, *National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics (NCVPRIPG)*, Jodhpur, India, (2013)
51. Reversible logic implementation of AES algorithm, *By* Kamalika Datta, Vishal Shrivastav, Indranil Sen Gupta and Hafizur Rahaman, *Design and Technology of Integrated Systems (DTIS 2013)*, Abu Dhabi, UAE, (2013)
52. Rising Popularity of Interdisciplinary Research -- an Analysis of Citation Networks, *By* Chakraborty, T., Ganguly, N. and Mukherjee, A., *Social Networking Workshop of COMSNETS*, Bangalore, India, (2014)
53. Role of Power Grid in Side Channel Attack and Power-Grid-Aware Secure Design, *By* Xinmu Wang, Wen Yueh, Debapriya Basu Roy, Saibal Mukhopadhyay, Debdeep Mukhopadhyay, and Swarup Bhunia, *DAC*, , (2013)

54. Runtime delays in Indian railways: Is traffic the cause?, By Ghosh, S., Srivastava, H., Agarwal, S. and Mukherjee, A., *ACM DEV*, Bangalore, India, (2013)
55. Software Effort Estimation Using Functional Link Neural Networks Optimized by Improved Particle Swarm Optimization, By Tirimula Rao Benala, Rajib Mall, Satchidananda Dehuri, *SEMCCO*, Chennai, (2013)
56. STAIRoute: Global Routing using Monotone Staircase Channels, By Bapi Kar, Susmita Sur-Kolay, Chittaranjan Mandal, *IEEE Computer Society Annual Symposium on VLSI (ISVLSI) 2013*, Natal, Brazil, (2013)
57. Study of Interference Noise in Multi-Kinect Set-up, By Tanwi Mallick, Partha Pratim Das and Arun Kumar Majumdar, *VISAPP 2014 - International Conference on Computer Vision Theory and Applications*, Lisbon, Portugal, (2014)
58. That's sick dude!: Automatic identification of word sense change across different timescales, By Mitra, S., Mitra, R., Riedl, M., Biemann, C., Mukherjee, A. and Goyal, P., *ACL 2014*, Baltimore, USA, (2014)
59. Understanding how learning affects agreement process in social networks, By Maity, S. K., Porwal, A. and Mukherjee, A., *ASE/IEEE Socialcom*, Washington DC, (2013)
60. Verification of KPN level transformation, By Chandan Karfa, Dipankar Sarkar, Chittaranjan Mandal, *26th IEEE International Conference on VLSI Design*, Pune, India, (2013)

## Department of Electrical Engineering

### **Head**

Prof. Siddhartha Sen

### **Professors**

Barua, Alok	<i>Ph.D.(IIT Kharagpur)</i> , Fault Diagnosis of Analog and Mixed Signal Circuit In-Situ Measurement in Bio reactor
Bhattacharya, Tapas Kumar	<i>Ph.D.(IIT Kharagpur)</i> ,
Chakraborty, Chandan	<i>Ph.D.(IIT Kharagpur)</i> , Electric Machines, Sensorless & Fault Tolerant Control of Industrial Drives, Power Converters, Renewable Energy Systems
Das, Debapriya	<i>Ph.D.(IIT Delhi)</i> , Microgrid Operation, Power System Operation and Control, Electric Power Distribution System.
Das, Sarit Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Control Systems
Dutta, Pranab Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Biomedical Image Processing, Signal processing, Optoelectronics, Pattern analysis and machine vision
Kastha, Debaprasad	<i>Ph.D.(Tennessee)</i> , Wind Electrical Systems, Switched Mode Power Supplies, Machine Drives
Kishore, N K	<i>Ph.D.(IISc Bangalore)</i> , Power and Energy Systems
Maka, Srinivasu	<i>Ph.D.(IIT Kharagpur)</i> , Biomedical System Engineering, Control Systems & Instrumentation Engineering
Mohan, Bosukonda Murali	<i>Ph.D.(IIT Kharagpur)</i> , Computational Intelligence in Control Systems, Orthogonal Functions Applications in Control Systems, Control Systems
Mukhopadhyay, Siddhartha	<i>Ph.D.(IIT Kharagpur)</i> , Dynamic Systems Estimation and Control, Behavioral Modeling CAD and Testing of Analog and Mixed Signal VLSI Systems, Industrial Instrumentation Control and Automation, Aerospace Tracking Control and Guidance, Modeling Estimation and Control of Switching Circuits and systems, Failure Diagnostics Prognostics and Tolerance for Vehicular and Industrial Systems
Pal, Jayanta	<i>Ph.D.(IIT Roorkee)</i> , Controller Design, Model Order Reduction, Power Systems Control, Genetic Algorithm Applications, Fractional Order Systems, Magnetic Levitation, Neural Networks
Patra, Amit	<i>Ph.D.(IIT Kharagpur)</i> , DC-DC Power Conversion, Embedded Control Systems, Fault Diagnostics and Prognostics, Analog and Mixed Signal VLSI Design and Systems on Chip
Pradhan, Ashok Kumar	<i>Ph.D (Sambalpur Univ.)</i> , Power System Protection - Wide Area Measurement System- Smart Grid- Applied Signal Processing
Ray, Goshaidas	<i>Ph.D.(IIT Delhi)</i> , Robust Stabilization, Time-Delay System, Decentralized Control and State Estimation, Intelligent Control, Network Control Systems

Routray, Aurobinda	<i>Ph.D.(Sambalpur Univ)</i> , Cognitive Modelling and Human Monitoring, Embedded Systems Design for Real Time Signal and Image Processing, Data Driven Diagnostics and Prognostics
Sen Gupta, Sabyasachi	<i>Ph.D.(IIT Kharagpur)</i> ,
Sen, Siddhartha	<i>Ph.D.(IIT Kharagpur)</i> , Fractional Order Circuits and Systems, Capacitive Sensors and MEMS, Control Allocation, Robust Control
Sinha, Avinash Kumar	<i>Ph.D.(Pilani)</i> , Smart Grid, Electrical Energy Systems

***Associate Professor***

Poddar, Gautam	<i>Ph.D.(IISc Bangalore)</i> , Medium voltage converter with high frequency isolation
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***Assistant Professors***

Bajpai, Prabodh	<i>Ph.D.(IIT Kanpur)</i> , 1. Renewable Energy Systems, 2. Power System Restructuring
Bhattacharya, Tanmoy	<i>Ph.D.(IISc. Bangalore)</i> , Power Converters and Machine Drives, Power converter topology and control for HVDC and FACTS
Biswas, Karabi	<i>Ph.D.(IIT Kharagpur)</i> , Sensor Design, Development of Instrumentation System, Study of Fractional Order Systems
Chatterjee, Dheeman	<i>Ph.D.(IIT Kanpur)</i> , Power System Dynamics, Grid Integration of Wind Power, HVDC Transmission and FACTS controllers
Chattopadhyay, Souvik	<i>Ph.D (IISc. Bangalore)</i> , Digital Control of Power Converters, Soft-switched dc dc converters
Deb, Alok Kanti	<i>Ph.D.(IIT Delhi)</i> , Control Systems, Computational Intelligence, Fault Diagnosis
Fulwani, Deepak	<i>Ph.D.(IIT Bombay)</i> ,
Kapat, Santanu	<i>Ph.D.(IIT Kharagpur)</i> , Nonlinear Analysis of Digitally Controlled DC-DC Converters, High Performance Digital Control in Power Converter Circuits
Mukherjee, Anirban	<i>Ph.D. (IIT Kharagpur)</i> , Machine learning for Healthcare applications, Medical Signal/Image Processing
Patra, Sourav	<i>Ph.D.(IIT Kharagpur)</i> , Robust control, Nonlinear control

***Faculty Appointments***

Deepak Fulwani	Assistant Professor
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***Faculty Resignation***

B Saritha	Assistant Professor
Deepak Fulwani	Assistant Professor



### ***Brief Description of on-going activities***

From classical to modern, from milli watts to tens of kilo watts, from conventional to non-conventional, the electrical engineering department investigates these all. The range of investigation for this department is one of the broadest in this institute. The major on going activities are categorized as follows: Machine Drives and Power Electronics: \* Magnetic Levitation \* Superconducting magnetic energy storage \* Variable frequency AC-Drives \* Simulation of power electronic circuits \* Resonant Converters \* Design of integrated circuits for Power Management \* Nonlinear phenomena in Power Electronics \* Automotive Electronics \* Diagnostic of drives \* Drive fatigue analysis Control and Dynamic Systems: \* Neuro-fuzzy controllers \* Control of chaotic systems \* Discrete event and hybrid systems \* Fault-tolerant control of aero-space systems \* Attitude control of satellites and launch vehicles \* Robust stabilization using periodic controllers \* Reduced order modeling \* Control of Variable Air-Volume Air-Conditioning Systems \* Bifurcation theory of hybrid dynamical systems \* Delta domain digital control analysis and design \* Neural networks applications in control \* Genetic algorithm applications in control \* Decentralized control of large scale systems \* Nonlinear dynamics \* Fractional order system and their applications Power and Energy Systems: \* Wind turbines \* Power system dynamics \* Real-time digital simulation of power systems \* Power system protection \* Intelligent relaying \* State estimation of power systems \* Condition and Diagnostic Monitoring of Power Apparatus \* Energy audit and management \* Power system planning and optimisation \* Wavelet Application to Power system Transients \* Neural Net Application to Partial Discharge Phenomenon \* Electric Field Computations, Lightning Protection, Material Characterization \* FACTs Instrumentation and Signal Processing: \* Laser based profile measurement \* Image based measurement systems \* Motion estimation using MRI and colour Doppler imaging \* Non-Linear and Statistical Signal Processing \* Real Time Algorithms for Detection and Diagnostics \* Condition monitoring of machines and power apparatus \* Testing of analog and digital VLSI circuits \* Fault detection and diagnosis of analog circuits \* Control and instrumentation of bio-reactors \* Fibre-optic components and sensors \* Biomedical signal processing \* Analysis of ECG signals \* Sensors fusion \* Multimedia Security \* Convex Optimization and LMI applications to Signal Processing \* Design and development of MEMS accelerometer \* Seismic signal processing, active noise control \* Fast algorithms for real time signal processing

### ***Thrust Areas***

1. This department has identified the following topics as the thrust areas of investigations: Efficient Power Converters & Drives, Micro-grid & Renewable Energy, Embedded Sensors & Systems, Integrated Power Management, Automotive Engineering, Cyber Physical Systems, Signal & Image Processing, Machine Learning, Advanced Control Theory & its Application, Estimation & Control of Industrial & Aerospace Systems

### ***International Collaborations***

Collaboration is going on through DST, India, and Research Council UK (RCUK) supporting a project on Stability and Performance of Photovoltaics. This is a joint collaboration involving IIT Bombay, IIT Kanpur, IIT Kharagpur and Solar Energy Centre, New Delhi from India, and Imperial College, London, Loughborough University, Northumbria Photovoltaics Application Centre (NPAC), Northumbria University, Strathclyde University from UK.

### ***Lectures by Visiting Experts***

1. Application of magnetic levitation and linear drive technologies to public rail-guided transports by Prof. Takafumi Koseki (The University of Tokyo, Japan)
2. Continuous Integral Sliding Mode Control: A Second Order Sliding Mode approach by Prof. Bigyan Bandyopadhyay (Professor, Interdisciplinary Programme in Systems and Control Engineering, Indian Institute of Technology Bombay)

3. Designing an ASIP for Hindi Text to Speech Synthesis *by* Dr. Atanendu Sekhar Mandal (Senior Scientist(IC Design Group), CEERI, Pilani)
4. Power engineering research at the University of Queensland *by* Prof Tapan Saha (Professor, School of Information Technology and Electrical Engineering, The University of Queensland, Australia)
5. From Embedded Systems to Cyber-Physical Systems *by* Dr. Dip Goswami ()
6. Terahertz Technology: What Can We Do with It? *by* Dr. Goutam Chattopadhyay (Principal Member of the Engineering Staff, California Institute of Technology, Pasadena, CA, USA.)
7. Wide area control of power system using PMU *by* Prof. Anjan Bose (Distinguished Professorship in Power Engineering, Washington State University, School of Electrical Engg & Computer science)
8. Transformer-System Interactions and Modeling *by* Prof. S. V. Kulkarni (Professor, Department Of Electrical Engineering, Indian Institute of Technology Bombay)
9. Energy R&D in GE *by* Dr. Vinay Jammu (Technology Leader for Aero Thermal and Mechanical Technologies-Asia, GE Global Research, Bangalore)

#### ***Doctoral and MS Degrees Awarded***

1. Pratim Kundu : Wide Area Measurement based Power System Protection(MS)
2. Susovon Samanta : New Models and Methods for Simulation and Compensator Design for Buck Converters under Peak Current Mode Control(Ph.D)
3. Monalisa Pattnaik : Speed Sensorless Control of a Stand-Alone Variable Speed Constant Frequency Double Output Induction Generator with Nonlinear and Unbalanced Loads(Ph.D)
4. Biswajit Kar : Online Signature Verification and Classification(Ph.D)
5. Supratim Gupta : Eye Image-based Algorithms to Estimate Percentage Closure of Eye and Saccadic Tatio for Alertness Detection(Ph.D)
6. Sougata Kumar Kar : A Linear Transconductance Amplifier and Its Application in Capacitive Sensor Systems(Ph.D)
7. Kuntal Mandal : Dynamical Analysis of Resonant DC-DC Converters(Ph.D)
8. Rupam Mukherjee : Electromagnetic Interference in Power Converters and its Impact on Analog and Digital Communication Systems(Ph.D)
9. Arnab Khawas : Yield Estimation and Optimization of Analog Circuit Using Behavioral Modeling(MS)
10. Nitin Kumar Y. B. : Architectural Strategies for Effective Design of Quadrature Sigma-Delta Modulators(Ph.D)
11. Debasmita Mondal : Fabrication and Performance Studies of PMMA-Coated Fractional Order Elements(MS)

#### ***Member - Professional Bodies***

1. Chakraborty, Chandan, *Member-at-large* - IEEE Industrial Electronics Society
2. Chakraborty, Chandan, *Senior Member* - IEEE
3. Pradhan, Ashok Kumar, *Senior Member* - IEEE, USA
4. Pradhan, Ashok Kumar, *Life member* - Indian Society Of Tecnical Education (ISTE)
5. Mukherjee, Anirban, *Member* - IEEE
6. Mukherjee, Anirban, *Life Member* - System Society of India
7. Chatterjee, Dheeman, *Member* - IEEE
8. Deb, Alok Kanti, *Regular* - IEEE
9. Biswas, Karabi, *Regular* - System Society of India
10. Biswas, Karabi, *Regular* - IEEE
11. Bajpai, Prabodh, *Member* - IEEE, USA
12. Bajpai, Prabodh, *Associate Member* - The Institution of Engineers (India)
13. Bhattacharya, Tanmoy, *Member* - IEEE
14. Kapat, Santanu, *Member* - IEEE

15. Sinha, Avinash Kumar, *Member* - IEEE, USA
16. Sen, Siddhartha, *Member* - IEEE
17. Barua, Alok, *Senior Member* - IEEE
18. Barua, Alok, *Life Member* - System Society of India
19. Patra, Amit, *Member* - IEEE
20. Mohan, Bosukonda Murali, *Member* - Automatic Control and Dynamic Optimization Society
21. Mohan, Bosukonda Murali, *Senior Member* - IEEE (USA)
22. Mohan, Bosukonda Murali, *Member* - IFAC (International Federation of Automatic Control) Technical Committee on Computational Intelligence in Control
23. Mohan, Bosukonda Murali, *Member* - Asian Control Association
24. Mohan, Bosukonda Murali, *Life Member* - Systems Society of India
25. Mukhopadhyay, Siddhartha, *Member* - IEEE
26. Mukhopadhyay, Siddhartha, *Life member* - System Society of India
27. Mukhopadhyay, Siddhartha, *Member* - National Committee on IVHM
28. Dutta, Pranab Kumar, *Member* - IEEE
29. Kastha, Debaprasad, *Regular* - IEEE
30. Routray, Aurobinda, *Member* - IEEE, USA
31. Routray, Aurobinda, *Member* - SIAM, USA
32. Pal, Jayanta, *Life Member* - Systems Society of India

***Member - Editorial Board***

1. Chakraborty, Chandan (2006) *Associate Editor (2006~)* - IEEE Transactions on Industrial Electronics
2. Chakraborty, Chandan (2013) *ADCOM Member (2012-13)* - IEEE Industrial Electronics Society
3. Chakraborty, Chandan (2008) *Member, Editorial Board (2008~)* - IET Power Electronics
4. Chakraborty, Chandan (2013) *Editor-in-Chief (2013~)* - IE Tech News (ITeN)
5. Chakraborty, Chandan (2010) *Editor (2010~)* - IEEE Transactions on Sustainable Energy
6. Chakraborty, Chandan (2012) *Editor (2012~)* - IEEE Power Engineering Letters
7. Chakraborty, Chandan (2014) *ADCOM Member (2014-16)* - IEEE Industrial Electronics Society
8. Chakraborty, Chandan (2008) *Associate Editor (2008~)* - IEEE Industrial Electronics Magazine
9. Chakraborty, Chandan (2013) *Chair (2013-14)* - Power Electronics Technical Committee, IEEE Industrial Electronics Society
10. Das, Sarit Kumar (2013) *Editor* - IETE J Education
11. Deb, Alok Kanti (2013) *Reviewer* - IEEE Trans. on Industrial Electronics
12. Deb, Alok Kanti (2013) *Reviewer* - Neurocomputing
13. Mohan, Bosukonda Murali (2013) *Associate Editor-in-Chief* - J. Control Engineering & Technology
14. Mohan, Bosukonda Murali (2010) *Member* - Int. J. Engineering Science, Advanced Computing & Bio-Technology
15. Mohan, Bosukonda Murali (2013) *Associate Editor* - Control & Intelligent Systems
16. Mohan, Bosukonda Murali (2013) *Member* - Advances in Fuzzy Systems
17. Mohan, Bosukonda Murali (2010) *Member* - Int. J. Mathematics & Engineering with Computers
18. Mohan, Bosukonda Murali (2013) *Associate Editor* - WSEAS Trans. Systems & Control
19. Mohan, Bosukonda Murali (2013) *Associate Editor* - Int. J. Circuits, Systems, & Signal Processing
20. Mohan, Bosukonda Murali (2013) *Associate Editor* - Int. J. Fuzzy Systems & Advanced Applications
21. Mohan, Bosukonda Murali (2007) *Associate Editor* - Int. J. Automation & Control

22. Patra, Amit (0) *Member, Editorial Board* - International Journal of Electrical Engineering Education
23. Sinha, Avinash Kumar (2007) *Member, Board of Advisors* - The ICFAI Journal of Science and Technology

***Awards & Honours***

1. Routray, Aurobinda (2013) *Samsung GRO Award 2012-2013 completed in July 2013*

***Sponsored Research Projects***

1. A Study of Hybrid FACTS Controllers for Transmission and High Voltage Distribution Application (Department of Science and Technology, India, Rs.51.00 Lakhs)
2. A Study of the Impacts of Increased Penetration of Wind Power on Power System Stability (DST, India, Rs.19.00 Lakhs)
3. A Study of the Operation and Control of a Proposed Coastal HVDC Highway for Offshore Wind Power Integration (Department of Science and Technology, India, Rs.52.00 Lakhs)
4. Artificial Heart Development Programme- Phase II (HDP) (DST, New Delhi, Rs.25.24 Lakhs)
5. AVLSI Consortium (Multiple Organisations in India and Abroad, Rs.200.00 Lakhs)
6. Centre of Excellence for training and research in Microfluidics (IIT Kharagpur, Rs.251.90 Lakhs)
7. DC-AC conversion and grid side paralleling (DST, Rs.60.00 Lakhs)
8. DC-DC conversion for solar PV including MPPT & battery charge controller (DST, Rs.80.00 Lakhs)
9. Design & Feasibility Study of Versatile Low-cost Functional Electrical Stimulator (FES) for Hemiplegics (National Institute for the Orthopaedically Handicapped (NIOH)(Min. of Social Justice & Empowerment,, Rs.20.00 Lakhs)
10. Design and Development of an On-board Intelligent Embedded Platform for detection of weak failure modes and prognosis of severe faults in locomotives (Research Design and Standards Organisation (RDSO), Lucknow, Rs.177.33 Lakhs)
11. Design and Fabrication of of SOI based MEMS Accelerometer (DFS) (DST, Rs.30.00 Lakhs)
12. Design of an Embedded System for On-board Assessment of the Level of Alertness in Human Driver (DIT, Rs.39.00 Lakhs)
13. Design of Robust Biochemical Network (CSIR, HRDG, New-Delhi, Rs.11.48 Lakhs)
14. Design, Development and Fabrication of Power Management Integrated Circuits (Tagore Technologies, USA, Rs.5.00 Lakhs)
15. DETECTION AND DIRECTION OF HIGH IMPEDENCE FAULT (DEPARTMENT OF SCIENCE AND TECHNOLOGY, NEW DELHI, Rs.13.00 Lakhs)
16. Developing Fractional Order Circuit Element (Fractance) (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
17. DEVELOPMENT OF A PORTABLE EMBEDDED SYSTEM FOR HUMAN MONITORING/SIGNALS & SYSTEMS FOR LIFE SCIENCES (HLS) (MHRD, Rs.40.00 Lakhs)
18. Development of Electrowetting based Microfluidic device with Controller for Clinical Diagnoses (DBT, Rs.41.45 Lakhs)
19. Development of Low Cost, Ultra-fast, Energy Efficient Power Management Solutions for Dynamic Voltage Scaling in Multicore Parallel Embedded Processors (Proposal accepted in SERB Fast Track, DST, Rs.0.00 Lakhs)
20. Development of Railway Bridge Health Monitoring System with Wireless Sensor Network (RDSO, Ministry of Railways, Rs.187.02 Lakhs)
21. DEVELOPMENT OF SMART HOME ENERGY MANAGEMENT SYSTEM (SHE) (Power Grid Corporation of India Ltd, Rs.4.92 Lakhs)
22. Development of the fourth circuit element , :Fractance (IIT Kharagpur, Rs.94.50 Lakhs)

23. Educational Component of GM Collaborative Research Laboratory (General Motors, Rs.125.00 Lakhs)
24. Fast Fixed Point Algorithms for Identifying Alertness and Emotions (Samsung Advanced Institute of Technology(SAIT) South Korea, Rs.0.00 Lakhs)
25. HE EFFECT OF MEDITATION, PRANAYAM AND MEDITATIVE SOUNDS ON THE COGNITIVE AND EMOTIONAL PERFORMANCE OF HUMAN BRAIN: A STUDY USING AN INTEGRATED SIGNAL (MHRD, Rs.15000000.00 Lakhs)
26. High Frequency, High Efficiency Hybrid DC-DC Converter (Maxim Corporation, Rs.15.00 Lakhs)
27. HISTORICAL EVIDENCE, MYTH AND GEOPHYSICAL MODELING TO ASSESS THE TECTONIL MOVEMENT AND RISKS ASSOCIATED WITH ODISHA COASTAL "HERITAGE" BELT (HPM) (MHRD, Rs.135.00 Lakhs)
28. IBM Open Collaborative Faculty Award (IBM, Almaden Research centre, USA, Rs.7.00 Lakhs)
29. Identification of Motifs in Integrated Cellular Networks (CSIR, Rs.14.00 Lakhs)
30. Identifying the role of positive feedback in biological systems - A control theoretic perspective (CSIR, India, Rs.0.00 Lakhs)
31. Improving End-of-Life Care by Integrating Indic Perspectives on Ageing and Dying (MHRD, Rs.75.00 Lakhs)
32. Integrated Vehicle Health Management (IVHM) for Automotive Engine Applications under National Programme on Micro and Smart Systems (NPMASS) (On-going) (ADA, Bangalore, Rs.277.30 Lakhs)
33. INTELLIGENT TOOLS FOR SMART ELECTRICAL GRIDS (SEG) (MHRD, Rs.55.92 Lakhs)
34. Modelling and design of polymer coated ion selective constant phase element (CPE) sensor (DST, Rs.14.40 Lakhs)
35. National Programme on Micro and Smart Systems (ADA, Bangalore, Rs.259.60 Lakhs)
36. ON-Chip DC-DC converter for PoL application (MAXIM India, Rs.15.00 Lakhs)
37. Online monitoring system for OHE traction parameters (RDSO, Ministry of Railways, Rs.254.02 Lakhs)
38. Protecting Power Systems using Wide area measurements (DEPARTMENT OF SCIENCE AND TECHNOLOGY, NEW DELHI, Rs.18.00 Lakhs)
39. Real Time Digital Simulator (TDS) (Centre for Development of Advanced Computing, Trivandrum, Govt. of India, Rs.5.47 Lakhs)
40. Reconfigurable Augmentation and Digital Control of DC-DC Converters for Fast Transient Recovery (ISIRD, IIT Kharagpur, Rs.5.00 Lakhs)
41. Renewable Hybrid Energy Power Plant for Telecom station in Isolated Sites (Vodafone Essar-East Limited, Kolkata, Rs.95.00 Lakhs)
42. RESERVOIR CHARACTERIZATION USING ARTIFICIAL INTELLIGENT TECHNIQUES (SOFT COMPUTING) (RCI) (GEOPIC, Rs.48.00 Lakhs)
43. Robust anti-windup compensator design considering plant uncertainty and limitations (DST, India, Rs.0.00 Lakhs)
44. Speed Sensorless Control of Induction Motor Drive with Limited Switching Frequency and Operation into the Field Weakening Region for Traction Applicat (IIT Kharagpur (ISIRD Project), Rs.5.00 Lakhs)
45. STABILITY AND PERFORMANCE OF PHOTOVOLTAIC (SAP) (DST, Rs.218.50 Lakhs)
46. STATCOM with neutral compensation (TCO) (Centre for Development of Advanced Computing, Trivandrum, Govt. of India, Rs.4.00 Lakhs)
47. Testing & characterization of In-House Development of MEMS Capacitive Accelerometer (TCA) (ISRO-IIT Kharagpur Cell, Rs.5.00 Lakhs)
48. The Reconfiguring D<sup>2</sup>na (Generosity) as a new Institutional Financial Mechanism for Social Enterprises (MHRD, Rs.75.00 Lakhs)
49. Virtual Lab on Embedded Systems (MHRD, Rs.55.00 Lakhs)
50. Virtual Laboratory on Analog Signals, Networks and Measurement Laboratory (MHRD, Govt. of India, Rs.67.00 Lakhs)

### ***Consultancy Projects***

1. 2x500kVA AC source with VVVF Drive (KAVD) (KELTRON, Trivandrum, Kerala - 695 564, Rs.7.50 Lakhs)
2. A New Application of AMS CAD: Smart Grid, (Synopsys CAD Lab) (On-going) (, Rs.0.00 Lakhs)
3. Behavioral Modeling and Top-Down Design of Switching Converter ICs (On-going) (National Semiconductor Corporation, USA, Rs.40.00 Lakhs)
4. Bus Paralleling Controller with CAN Interface (CANI) (Centre for Development of Advanced Computing, Trivandrum, Govt. of India, Rs.1.50 Lakhs)
5. CONSULTANCY SERVICES FOR GRID SECURITY ASSESSMENT AND GRID MODERNIZATION AND CYBER SECURITY FOR CONTROL CENTERS (CSCC) (POSOCO, Rs.25.41 Lakhs)
6. Data-Driven Methods for Fault Diagnosis and Prognosis using Operating Parameters (General Motors India Science Lab, Rs.0.00 Lakhs)
7. DEVELOPMENT OF AN INTEGRATED ALERTNESS ASSESSMENT SYSTEM FOR AIRCRAFT PILOTS FOR A GO/NO-GO ASSESSMENT (APN) (DIPAS, DRDO, Rs.10.00 Lakhs)
8. Development of communication link based high frequency converter (CLFC) (C-DAC, Trivandrum and TaTa Power, Rs.4.00 Lakhs)
9. Development of Digital Hardware for M2M Applications (Fountainhead Software Solutions, Rs.2.00 Lakhs)
10. DISTRIBUTION SYSTEM LOSS CALCULATION AND POSSIBLE IMPROVEMENT (NESCO, BALASORE, ODISHA, Rs.5.00 Lakhs)
11. Feasibility study of IGBT based 4MW, 6.6KV Medium Voltage VFD (FIMV) (BHEL, Bangalore-560 026, Rs.9.55 Lakhs)
12. Formal Design Intend Modelling and Verification of Mixed Signal Behaviors (On-going) (Semiconductor Research Council (SRC), USA, Rs.0.00 Lakhs)
13. High Voltage Power Supply (HVPS) (Veeral Control Pvt. Ltd. Gandhinagar, Rs.4.00 Lakhs)
14. Natural Harmonic Compensation of Medium Voltage Converters (NHCM) (C-DAC, Trivandrum, Rs.8.60 Lakhs)
15. Resonant Frequency Converter II (Megatherm Electronics Pvt. Ltd., Rs.2.00 Lakhs)
16. Sensorless high voltage single phase front-end converter (SHVC) (Signotron India pvt. Ltd., Kolkata, Rs.2.00 Lakhs)
17. Sensorless PMSM Controller (SRPC) (Veeral Control Pvt. Ltd. Gandhinagar, Rs.3.00 Lakhs)
18. Solar inverter for grid connected and standalone mode with MPPT (MPPT) (Signotron India pvt. Ltd., Kolkata, Rs.2.50 Lakhs)
19. Technology Development for Solar Inverter (TDSI) (KELTRON, Trivandrum, Kerala - 695 564, Rs.4.50 Lakhs)
20. Universal auxiliary converter for railways rolling stock (UACR) (Indian Railways and C-DAC, Trivandrum, Rs.5.00 Lakhs)

### ***Technology Transferred***

1. Freescale Semiconductor, Austin, USA - A verification software tool delivered : Rs. 0.00 Lakh
2. GEOPIC, Dehradun, ONGC - An information-theoretic methodology to predict lithological properties using seismic attributes and well log data : Rs. 50.00 Lakh
3. Texas Instruments - Technology transfer continuously takes place : Rs. 0.00 Lakh

### ***Patents (filed / granted)***

1. A Bi-Directional Multiple-Input Single Inductor Multiple Output Switcher with Buck-Boost Inverted Output (with Ashis Maity, Pradipta Patra, Asif Iqbal)

2. A Control System to Minimize the Dynamic Power Loss in an Unbalanced Voltage Regulator Module and Its Method of Operation (with R. B. Panguloori and D. Kastha)
3. A DC Nanogrid Power Delivering System (with S Kapat, P B Kamesh and Bipin Mandi)
4. A DC-DC Converter Architecture for Low Voltage High Current Applications (with Sutej Reddy and D Kastha)
5. A Fast Response Energy Efficient Current Control Scheme in a DC-DC Converter with a Freewheeling Switch
6. A HYBRID ENERGY POWER PLANT ADAPTED TO UTILIZE MULTIPLE ENERGY SOURCE
7. A METHOD FOR DETECTING AND CLASSIFYING POWER QUALITY ANOMALIES IN POWER SYSTEMS
8. A Method of Maintaining the Zone Temperature in a Variable Air Volume Air Conditioning System and a System Thereof
9. A Minimised Cross-Regulation Control Scheme for Single-Inductor Multiple-Output DC-DC Converter Topologies (with Pradipta Patra and Jyotirmoy Ghosh)
10. A New DC-DC Converter Architecture for Low Voltage and High Current Applications
11. A Single Input Single Inductor Multiple Output DC-DC Switcher Converter (with P. Patra and A. Eqbal)
12. A System for Improving Load Efficiency of a Switching Power Converter (with S. Kapat)
13. An Adaptively Biased, Self-Compensated, Unconditionally Stable, Area-Efficient LDO Topology (with Ashis Maity)
14. An information-theoretic methodology to predict lithological properties using seismic attributes and well log data
15. B. C. Mandi, S. Kapat, P. B. Kameshwar, and A. Patra, "A DC Nanogrid Power Delivering System," provisionally filed Indian Patent
16. Dynamically Biased Amplifier Circuit and Methods for Improving its Dynamic Range (with Ashis Maity)
17. Event-driven data mining method for improving fault code settings and isolating faults
18. Method for Improvement of Light Load Efficiency of a DC-DC Converter by Skipping Pulses through a Voltage Mode Control Loop
19. S. Kapat and K. Hariharan, "Formulating and Tuning of Current-Mode Controlled DC-DC Boost Converter for High Performance Using normalized Output Current," provisionally filed Indian Patent,
20. S. Kapat, "Apparatus Equipped for Reconfiguring DC-DC Converter Augmentation for Ultra-fast Transient Recovery," provisionally filed Indian Patent
21. SEE SAW Bioreactor
22. Switching Power Converter Adapted for Improved Output Impedance and Load Regulation through Inductor Current Filtering

### **Visits Abroad by Faculty Members**

1. Sen, Siddhartha - To present a paper in European Control Conference 2013 (Zurich, Switzerland, ) July 16-19, 2013
2. Das, Sarit Kumar - To present paper in conference (Kuala Lumpur, Malaysia, ) 13-15 Dec. 2013
3. Chakraborty, Chandan - To present paper in ISIE2013 and to attend the ADCOM meeting of IEEE Industrial Electronics Society (Taipei, Taiwan, ) 29th May 2013 to 3rd June 2013
4. Chakraborty, Chandan - To present papers in IECON2013 and to attend ADCOM Meeting of IEEE Industrial Electronics Society (Vienna, Austria, ) 9th Nov-17th Nov., 2013
5. Pradhan, Ashok Kumar - Conference (VANCOUVER Canada, ) one week July 2013
6. Barua, Alok - To attend an International Conference (University of California, Berkeley, ) 22nd to 26 October, 2013
7. Biswas, Karabi - For discussion on collaborative project (California, USA, ) 27th October to 2nd November, 2013

8. Biswas, Karabi - To attend and present paper in IEEE sensor conference (Baltimore, USA, )
9. Biswas, Karabi - To attend and present paper in ICIIS conference (Kandy, Srilanka, ) 18th-20th December, 2013
10. Mukhopadhyay, Siddhartha - Foster academic and R&D collaborations, particularly focusing on the High Speed Rail Technology (Japan External Trade Organization and University of Tokyo, Japan, ) June 1-8, 2013
11. Mukhopadhyay, Siddhartha - work on the details of the collaborative partnership between IIT, Kharagpur and WMG (University of Warwick, Coventry, UK and 6th Annual Conference of IITUK in London, ) November 19-23, 2013
12. Mukhopadhyay, Siddhartha - Participating in IIT 2013 Global Conference at Houston and handover the DAA and meet the alumni (IIT 2013 Global Conference at Hilton Americans, Houston, Texas and visit John Hopkins University, USA, ) December 6-14, 2013
13. Sinha, Avinash Kumar - Academic collaboration (KSTU, Kazakhstan, ) 17th to 28th June 2013
14. Sinha, Avinash Kumar - Academic collaboration (University of Queensland, Australia, ) July 10-12, 2013

### **Invited Lectures by Faculty Members**

1. Fractance based sensor *by* Biswas, Karabi (National Seminar on Taste Sensor, IIT Kharagpur)
2. Coal Mill Modeling *by* Deb, Alok Kanti (BUIE, Bankura)
3. Robosoccer *by* Deb, Alok Kanti (BUIE, Bankura)
4. Robosoccer *by* Deb, Alok Kanti (Mallabhum Institute of Technology, bankura)
5. Particle Swarm Optimization - Convergence and Applications *by* Deb, Alok Kanti (BUIE, Bankura)
6. MATLAB & Simulink *by* Deb, Alok Kanti (RDSO Lucknow)
7. Fuzzy Regulators for Nonlinear Systems using LMI based Design *by* Deb, Alok Kanti (Dept of Mathematics, NIT Rourkela)
8. Neural Networks and SVMs *by* Deb, Alok Kanti (IEEE Workshop on Computational Intelligence on July 14, 2013 at IIT Kanpur)
9. Flexible AC Transmission System *by* Chatterjee, Dheeman (EEE department, BIT Meshra (short term course on Power converter and applications))
10. Evolving New Generation of Intelligent Protection *by* Pradhan, Ashok Kumar (Silicon Institute of Technology, Bhubaneswar)
11. Synchrophasor Assisted Network Protection *by* Pradhan, Ashok Kumar (IIT Roorkee)
12. Review of Modern control strategies and some practical applications. *by* Ray, Goshaidas (Bhubaneswar Rajdhani Engg. College)
13. A review of linear algebra and some applications. *by* Ray, Goshaidas (Kolaghat Engg. College, Kolaghat)
14. Robust control and some practical applications. *by* Ray, Goshaidas (NIT Durgapur)
15. Power Management Solutions *by* Patra, Amit (Infineon Technologies, Bangalore, India)
16. Periodic compensation of continuous and discrete-time plants *by* Das, Sarit Kumar (NIT Durgapur)
17. Robust stabilization of uncertain dynamical systems *by* Patra, Sourav (National Institute of Technology, Durgapur)
18. Control of Fractional Order Systems *by* Sen, Siddhartha (ACODS-2014, IIT Kanpur)
19. Analog integrated circuits for MEMS sensors *by* Sen, Siddhartha (NIT Arunachal)
20. Fractional Calculus *by* Sen, Siddhartha (NIT Rourkela)
21. Some recent developments on fractional order devices and circuits *by* Sen, Siddhartha (NIT Nagpur)
22. Recent Trends in Power Management Units for digital devices *by* Kastha, Debaprasad (NIT Rourkela)
23. Embedded Systems: Future Trends *by* Mukherjee, Anirban (Heritage Institute of Technology)
24. Beyond Critical Bandwidth of Linear Control *by* Kapat, Santanu (NIT Durgapur)



25. Signals & Systems via Orthogonal Functions *by* Mohan, Bosukonda Murali (Gayatri Vidya Parishad College of Engineering)
26. National Seminar on ESIC-2013 *by* Mukhopadhyay, Siddhartha (Bengal Engineering and Science University, Shibpur, Howrah)
27. Faculty Development Programme *by* Mukhopadhyay, Siddhartha (KIIT University, Bhubaneswar, Odisha)
28. Third International Conference on Advances in Control and Optimization of Dynamical Systems *by* Mukhopadhyay, Siddhartha (IIT Kanpur)
29. Technology Day *by* Mukhopadhyay, Siddhartha (Central Mechanical Engineering Research Institute (CMERI), Durgapur)
30. *by* Mukhopadhyay, Siddhartha (National Institute of Technology, Rourkela)
31. Detection of Fatigue and Drowsiness in Human Drivers *by* Routray, Aurobinda (DRDO Head Quarters Life Science Division)
32. Overview of Power Plant Technology and Direction of Policy *by* Sinha, Avinash Kumar (IIM Kolkata)
33. ‘Overview of power sector and developments in renewable energy’ *by* Sinha, Avinash Kumar (IIM Lucknow)
34. Synchronization measures on time series matching: a case. Study on Brain and Seismic signals *by* Routray, Aurobinda ( National Seminar on Nonlinearity, Complex Dynamics & Chaos in Economics and Finance)

#### ***Books Published***

1. Alok Barua: Analog Signal Processing: Analysis and Synthesis *published by* Wiley India (2014)
2. S. Mukhopadhyay, S. Sen and A. K. Deb: Industrial Instrumentation, Control and Automation *published by* Jaico (2013)
3. Soumya Pandit, Chittaranjan Mandal, Amit Patra: Nano-scale CMOS Analog Circuits: Models and CAD Techniques for High-Level Design *published by* CRC Press (2014)

#### ***Short-Term Courses, Training Programmes and Workshops organised***

1. Distribution System Technology for CESC (Nov. 18-22, 2013)
2. Distribution System Technology for WBSEDCL (May 17-21, 2013)
3. Distribution System Technology for WBSEDCL (Sept. 23-27, 2013)
4. Distribution System Technology for WBSEDCL (Feb. 21-25, 2014)
5. Embedded & Reconfigurable Computing for Control & Signal Processing & Xilinx Embedded Design flow us (Jan 6-10, 2014)
6. Three Phase Inverters & AC Drives (16-26 November, 2013)
7. Xilinx Embedded Design Flow using ZYNQ & Vivado Design Suite (5 days)

#### ***Papers Published in Journals***

1. A Closed-loop Control Scheme for Steering Steady States of Glycolysis and Glycogenolysis Pathway *By* Surajit Panja, Sourav Patra, Anirban Mukherjee, Madhumita Basu, Sanghamitra Sengupta and Pranab K. Dutta *IEEE/ACM Trans. on Computational Biology and Bioinformatics* 10(4), pp. 858-868 (2013)
2. Effect of Sleep Deprivation on Functional Connectivity of EEG Channels *By* S. Kar, A. Routray *Systems, Man, and Cybernetics: Systems, IEEE Transactions on (Volume:43 , Issue: 3 )* 666 - 672 (2013)
3. A Closed-Loop Control Scheme for Steering Steady States of Glycolysis and Glycogenolysis Pathway *By* Surajit Panja , Sourav Patra, Anirban Mukherjee , Madhumita Basu, Sanghamitra Sengupta, Pranab K. Dutta *IEEE/ACM Trans. on Computaional Biology and Bioinformatics* 10 838 (2013)

4. A microfluidic device for continuous manipulation of biological cells using dielectrophoresis  
By Debanjan Das, Karabi Biswas and Soumen Das *Medical Engineering & Physics*  
<http://dx.doi.org/10> (2013)
5. A New Algorithm for Small-Signal Analysis of DC–DC Converters By K. Mandal , S. Banerjee and C. Chakraborty *IEEE Transactions on Industrial Informatics* 10, 628 - 636 (2014)
6. A new analysis of reciprocated beam bending in electrostatic comb drives using a semi-analytical approach. By Mukherjee B., Swamy K.B.M. and Sen S. *Communications in Nonlinear Science and Numerical Simulation* vol. 19, pp. 2115-30 (2014)
7. A New Multilevel Inverter Topology With Self-Balancing Level Doubling Network By S. K. Chattopadhyay and C. Chakraborty *IEEE Transactions on Industrial Electronics* 61, 4622-4631 (2014)
8. A sensitivity based approach to assess the impacts of integration of variable speed wind farms on the transient stability of power systems By Arghya Mitra, Dheeman Chatterjee *Renewable Energy* Vol. 60, pp 6 (2013)
9. A Vision-Based System for Monitoring the Loss of Attention in Automotive Drivers By George, A. Happy, S.L. Routray, A. *Intelligent Transportation Systems, IEEE Transactions on (Volume:14 , Issue: 4 )* Vol 1825 - 1838 (2013)
10. Adaptive distance relay setting for series compensated line, By M. Biswal, B. B. Pati, and A. K. Pradhan *Int. Journal of Electrical Power and Energy system* vol. 52, pp. 198-206 (2013)
11. An on-board vision based system for drowsiness detection in automotive drivers By Anirban Dasgupta, Anjith George, S. L. Happy, Aurobinda Routray, Tara Shanker *International Journal of Advances in Engineering Sciences and Applied Mathematics* Volume 5, 94-103 (2013)
12. “Performance of an Off-Board Test Rig for an Automotive Air Conditioning System□? By Santanu P. Datta, Prasanta K. Das and Siddhartha Mukhopadhyay *International Journal of Air-Conditioning and Refrigeration* Vol. 21, No. 3 (2013)
13. Comparative Evaluation of Symmetric SVD Algorithms for Real-Time Face and Eye Tracking By Tapan Pradhan, Aurobinda Routray, Bibek Kabi *Matrix Information Geometry* pp 323-340 (2013)
14. Control allocation for an over-actuated satellite launch vehicle By Arun Kishore W.C, Santanu Dasgupta, Gosaidas Ray and Siddhartha Sen *Aerospace Science and Technology* Vol., 28, pp.56-71 (2013)
15. Control Scheme for Reduced Cross Regulation in Single-Inductor Multiple-Output DC-DC Converters By P Patra, J Ghosh, A Patra *Industrial Electronics, IEEE Transactions on* 60 (11), 5095-5104 (2014)
16. Decentralized Operation of Residential Energy Resources in the Smart Grid By Ashish R. Hota, and Prabodh Bajpai *International Journal of Renewable Energy* Vol. 5, pp.55-76 (2014)
17. Design and performance study of phase-locked loop (PLL) using fractional-order loop filter By Tripathy M.C., Mondal D., Biswas K. and Sen S. *International Journal of Circuit Theory and Applications (to appear)* DOI:10.1002/cta.1972 (2014)
18. Directional relaying during single-pole tripping using phase change in negative-sequence current, By P. Jena and A. K. Pradhan *IEEE Transaction on Power Delivery* vol. 28,pp1548-1557 (2013)
19. Directional relaying in the presence of a thyristor-controlled series capacitor By P. Jena and A. K. Pradhan *IEEE Transaction on Power Delivery* vol28 no2pp.628-632 (2013)
20. Estimation of Within Cycle Dynamics of an SI Gasoline Engine Using Equivalent Cycle Reconstruction By Sengupta, S., Mukhopadhyay, S., Deb, A.K., Pattada, K. *IEEE Trans. on Instrumentation and Measurement (accepted)* (0)
21. Evaluation of Single cell electrical parameters from bioimpedance of cells suspension By D Das, FA Kamil, Karabi Biswas, S Das *RSC advances* DOI: 10.1039/C4RA004 (2014)
22. Free final time fractional optimal control problems By Biswas R.K. and Sen S. *Journal of Franklin Institute* vol. 351, pp. 941-51 (2014)

23. Harmonic Compensation with Zero Sequence Load Voltage Control in a Speed Sensorless DFIG Based Stand Alone VSCF Generating System By M. Pattnaik, D. Kastha *IEEE Trans. on Industrial Electronics* vol.. 60. No. 12. pp (2013)
24. Improved Delay-Dependent Stabilization of Time-Delay Systems with Actuator Saturation By Rajeeb Dey, S Ghosh, Goshaidas Ray, and A Rakshit *International Journal of Robust and Nonlinear Control* Vol.24, pp. 902- 917 (2014)
25. Issues and Solution Approaches in PHEV Integration to Smart Grid By Ashish Ranjan Hota, Mahesh Juvvanapudi and Prabodh Bajpai *Renewable & Sustainable Energy Reviews* 30, pp217-229 (2014)
26. Microgrid operation using fuel cells as distributed generation sources By S.Das, D.Das and A. Patra *International journal of applied engineering research*, Vol.8 , pp.31-34 (2013)
27. Optimal Load Scheduling Within a Microgrid Including Reliability Aspects By Zubin Japa Balan and Prabodh Bajpai *International Journal of Smart Grid and Clean Energy* 2, no.3, pp. 343-349 (2013)
28. Particle swarm optimization with Kalman correction By A. Naha and A. K. Deb *Electronic Letters* 49(7) (2013)
29. Performance Evaluation of Perforated Micro-Cantilevers for MEMS Applications By Swamy K.B.M., Mukherjee B., Ali Z., Chakraborty S., and Sen S. *Journal of Micro/Nanolithography, MEMS, and MOEMS (JM3)* 19(2), 023001 (2014)
30. Rational approximation and analog realization of fractional order transfer function with multiple fractional powered terms By M. Khanra, J. Pal, and K. Biswas *Asian Journal of Control* Vol.15,p723-735 (2013)
31. Reactive Power Allocation for Loss Minimization in a Stand alone Variable Speed Constant Frequency Double Output Induction Generator By D. P. Bagarty, D. Kastha *IET Power Electronics* Journal Vol. 6, Issue 5, pp. (2013)
32. Reconfigurable Direct Allocation for Multiple Actuator Failures By A. Naskar, S. Patra and S. Sen *IEEE Transactions on Control Systems Technology* In Press (2014)
33. Reconfiguration of distribution network based on fuzzy multiobjective approach by considering loads of different types By S. Banerjee, D.Das and C.K.Chanda *Journal of institution of engineers(India), Series-B* 94(1) (2013)
34. Reduced Order Approximation of MIMO Fractional Order Systems By Munmun Khnara, Jayanta Pal and Karrabi Biswas *IEEE Journal on Emerging and Selected Topics in Circuits and Systems* 1-8 (99)
35. Robust Stability Criteria for a class of Uncertain Discrete-Time Systems with Time-Varying Delay By . K. Ramakrishnan and Goshaidas Ray, *Applied Mathematical Modeling* Vol.37,pp.1468-479. (2013)
36. Robustness of TCA Cycle at Steady-State: An LMI-Based Analysis and Synthesis Framework By S Panja, S Patra, A Mukherjee, M basu, S Sengupta, P K Dutta *IEEE Trans. on NanoBioScience* 12 128-134 (2013)
37. Speed Sensorless Vector Controlled Induction Motor Drive Using Single Current Sensor By V. Verma, C. Chakraborty, and Y. Hori, *IEEE Transactions on Energy Conversion* 28, 938 - 950 (2013)
38. Synchrophasor Assisted Prediction of Stability/Instability of a Power System By B. K. Saha Roy, A. K. Sinha and A. K. Pradhan *International Journal of Emerging Electric Power & Energy Systems* Volume 14, Pages 1 (2013)
39. Then and now: perspectives on teaching electrical and electronic engineering By John Mitchell, Ahmed Zobaa, Amit Patra, Paulo F Ribeiro, Saba Mylvaganam, Josef Timmerberg, Eugen Nolle *INTERNATIONAL JOURNAL OF ELECTRICAL ENGINEERING EDUCATION* 50 (3) 345-350 (2013)
40. Use of squared magnitude function in approximation and hardware implementation of SISO fractional order system By Munmun Khnara, Jayanta Pal and Karrabi Biswas *Journal of the Franklin Institute* 350, 1753-1767 (2013)
41. Voltage stability of radial distribution networks for different types of loads By S.Banerjee, D.Das and C.K.Chanda *International journal of power and energy conversion* Vol.5, pp.70-77 (2014)

### *Papers Presented in Conferences*

1. Automated Alertness and Emotion Detection for Empathic Feedback during e-Learning, By Happy, S.L. Dept. of Electr. Eng., IIT Kharagpur, Kharagpur, India Dasgupta, A. Patnaik, P. Routray, A., *Technology for Education (T4E), 2013 IEEE Fifth International Conference on, Kharagpur, (2013)*
2. A Built in Self Test System for Dynamic Performance Parameter Evaluation of Pipelined Analog to Digital Converter, By Alok Barua and Nalla Dhanunjay, *International Conference on Circuits and Systems for World Congress on Engineering and Computer Science, University of California, Berkeley, (2013)*
3. A New Model Reference Adaptive Formulation to Estimate Stator Resistance in Field Oriented Induction Motor Drive, By S. Basak, A.V. Ravi Teja, C.Chakraborty, and Y.Hori, *IEEE IECON 2013, Vienna, Austria, (2013)*
4. A Novel Approach for Droplet Position Sensing in Electrowetting Devices, By Shiraz Sohail and Karabi Biswas, *IEEE Sensors conference, Baltimore, USA, (2013)*
5. A Novel Control Principle for A Transformer Based Multiport Converter for Renewable Energy Integration, By S. Hazra, S. Bhattacharya and C. Chakraborty, *IEEE IECON 2013, Vienna, Austria, (2013)*
6. A Novel Joint State and Input Estimation Method for One Dimensional Heat Conduction Problem using Orthogonal Collocation, By Sangeeta Nundy, Siddhartha Mukhopadhyay, Alok Kanti Deb, *22nd National and 11th Int ISHMT-ASME Heat and Mass Transfer Conference, IIT Kharagpur,, (2013)*
7. A reconfigurable direct control allocation method, By A.K. Naskar, S. Patra and S.Sen, *European Control Conference (ECC2013), Zurich, Switzerland, (2013)*
8. A simple low cost scheme for closed loop operation of MEMS capacitive accelerometer, By Banibrata Mukherjee, K. B. M. Swamy, Dhaneesh Krishnan T V and Siddhartha Sen, *IEEE Students Technology Symposium (Techsym-2014), Kharagpur, (2014)*
9. A simple time domain approach for harmonic, load unbalance and reactive power compensation, By A. N. R. Siddartha, T. S. Basu and C. Chakraborty, *IEEE IECON 2013, Vienna, Austria, (2013)*
10. Asymmetric multilevel inverter with quasi-linear power distribution ratio for grid connected photovoltaic converters, By S. K. Chattopadhyay, C. Chakraborty, A. K. Sinha, and B. C. Pal, *IEEE ISIE 2013, Taipei, Taiwan, (2013)*
11. "A Novel Approach for Input Temperature Estimation by Prediction Error Minimization in One Dimensional Heat Conduction Problem using the Finite Difference Method", By S. Mal, S. Mukhopadhyay and P. K. Dutta, *22nd National and 11th International ISHMT-ASME Heat and Mass Transfer Conference, IIT Kharagpur, India, (2013)*
12. "A Novel Joint State and Input Estimation Method for One Dimensional Heat Conduction Problem using Orthogonal Collocation", By Sangeeta Nundy, Siddhartha Mukhopadhyay and Alok Kanti Deb, *22nd National and 11th International ISHMT-ASME Heat and Mass Transfer Conference, IIT Kharagpur, India, (2013)*
13. "Boost Converter Control using Smith Predictor Technique to minimize the effect of Right Half Plane Zero", By Santu Bag, Tanushree Roy, Siddhartha Mukhopadhyay, Susovon Samanta, and Robert Sheehan, *IEEE International Conference on Control Applications (CCA), 2013. Part of 2013 IEEE Multi-Conference on Systems and Control, Hyderabad, India, (2013)*
14. "Frequency Compensation and Power Stage Design for Buck Converters to Meet Load Transient Specifications", By Santu Bag, Siddhartha Mukhopadhyay, Robert Sheehan, Susovon Samanta and Tanushree Roy, *Power Electronic Conference 2014, (In Press), (2014)*
15. "Integrated Guidance and Control for Precision Guided Munition for Anti-Tank Application", By Aneesh Raghavan, Pulak Halder and S Mukhopadhyay, *IEEE C2SPCA - 2013, Bangalore, India, (2013)*

16. "Integrated Guidance and Control for Precision Guided Munition", By Aneesh Raghavan, Pulak Halder and S Mukhopadhyay, *IEEE INDICON-2013*, IIT Powai, Bombay, India, (2013)
17. "Modeling of Flexible Tactical Aerospace Vehicle for Hardware-in-Loop Simulations", By Yadunath Gupta, Pulak Halder and Siddhartha Mukhopadhyay, *International Modal Analysis Conference (IMAC - XXXII)*, Orlando, USA, (2014)
18. "Performance of an Automotive Airconditioning Test Rig with Restricted Air Flow through the Condenser", By S. P. Datta, P. K. Das, S. Mukhopadhyay, *22nd National and 11th International ISHMT-ASME Heat and Mass Transfer Conference*, IIT Kharagpur, India, (2013)
19. "Prediction of Curved Interface for Stratified Gas-Liquid Flow Fusing Data from Multiple Conductivity Probe", By S Chakraborty, P K Das and S Mukhopadhyay, *8th Int. Conf. on Multiphase Flow, ICMF 2013*, Jeju, Korea, (2013)
20. Circuit proposition for realization of approximated fractional order systems, By M. Khanra, J. Pal, and K. Biswas, *2014 International Conference on Fractional Order Differentiation and its Applications*, Catania, Italy, (2014)
21. Control of a self-excited squirrel cage induction machine based wind energy conversion system operating in both stand alone and grid connected modes, By V. Roy Chowdhury, D. Kastha, *4th Int. Conf. on Advances in Energy Research, ICAER-2013*, Mumbai, India, (2013)
22. Decentralized Mixed Delay-Dependent/Delay-Independent Stabilization of Interconnected Time-Delay Systems, By Sandip Ghosh, S. K. Das and Goshaidas Ray, *IFAC symposium on Large-Scale Complex Systems Theory and Applications*, Shanghai, China, (2014)
23. Detection of Electrical Discharges in DC Accelerator Using Photomultiplier Tubes, By Srutarshi Banerjee, A K Deb, R N Rajan and N K Kishore, *IEEE CATCON*, Kolkata, (2013)
24. Differential power based symmetrical fault detection during power swing, By J. Ganeswara Rao and A. K. Pradhan, *IEEE PES General Meeting.*, Vancouver, Canada, (2013)
25. Dynamic Model of Facial Expression Recognition based on Eigen-face Approach, By Nikunj Bajaj, Aurobinda Routray, S L Happy, *Proceedings of Green Energy and Systems Conference 2013, November 25, Long Beach, CA, USA*, Long Beach, CA, USA, (2013)
26. Effect of different controllers and capacitive energy storage on two area interconnected power system model using MATLAB SIMULINK, By P.Sanki, S.Ray,R.R.Shukla and D.Das, *IEEE international conference on automation, control, energy and systems*, AOT, Hooghly, West Bengal, (2014)
27. Embedded Reconfigurable Augmented DC-DC Boost Converter for Fast Transient Recovery, By N. Mishra, N. Jha, S. Kapat, and A. Patra, *26th International Conference on VLSI Design and 2013 12th International Conference on Embedded Systems*, Pune, India, (2013)
28. Expectation Maximization in Random Projected Spaces to Find Motifs in Genome Sequences, By Aniruddha Maiti and Anirban Mukherjee, *IEEE International Conference on Electronics, Communication, and Instrumentation*, Kolkata, (2014)
29. Gesture-Based Affective and Cognitive States Recognition Using Kinect for Effective Feedback during e-Learning, By Vermun, K. Senapaty, M. Sankhla, A. Patnaik, P. Routray, A., *Technology for Education (T4E), 2013 IEEE Fifth International Conference on*, Kharagpur, (2013)
30. Improved Delay-range-dependent Stability Analysis of a T-S Fuzzy System with Time Varying Delay, By Rajeeb Dey, V. E. Balas, T.C. Lin and Goshaidas Ray, *IEEE Int. Symposium on Computational and Intelligence and Informatics*, Badapest, Hungary., (2013)
31. Improved DOT reconstruction by estimating the inclusion location using artificial neural network, By Rasha Patra, Pranab K Dutta, *Spie medical Inaging*, Florida, USA, (2013)
32. Light Load Efficiency Improvement in High Frequency DC-DC Buck Converter Using Dynamic Width Segmentation of Power MOSFET, By NJ Mary, A Maity, A Patra, *27th International Conference on VLSI Design and 13th International Conference on Embedded Systems, 2014*, Mumbai, (2014)

33. Mathematical Models and Computational Aspects of the Simplest Fuzzy Two - Term Controllers, By K.M.A. Neelimegham & B.M. Mohan, *ACODS 2014*, IIT Kanpur India, (2014)
34. Multilevel inverters with level doubling network: a new topological variation, By S.K.Chattopadhyay and C.Chakraborty, *IEEE IECON 2013*, Vienna, Austria, (2013)
35. Multiscale noise-adaptive homomorphic filtering based speckle denoising in laser speckle imaging, By Kausik basak, M. Manjunath, P. K. Dutta, *Computer Vision, 4th National Conference on Pattern Recognition, Image Processing and Graphics*, Jodhpur, India, (2013)
36. Real-Time Substation Monitoring using Wireless Sensor Module, By B. K. Karmakar, A. K. Sinha, *GRIDTECH 2013 - 4th International Exhibition & Conference*, New Delhi, (2013)
37. Robust Stability Criteria for Uncertain Discrete-time Lure Systems with Time-varying State-Delay and Sector-bounded Nonlinearity, By K. Ramakrishnan and Goshaidas Ray, *Multi Systems Conference, Hyderabad International Convention Centre, India*, Hyderabad,, (2013)
38. Stabilization of a Cart-Inverted Pendulum System using a 2-Periodic Controller: Simulation Results, By Abhishek Dey, Sayantan Chakraborty, Sarit K Das, *IEEE conference on Systems, Process & Control (ICSPC 2013) 13-15 December, 2013.*, Kuala Lumpur, Malaysia,, (2013)
39. Three Switch Cell Soft-Switching Resonant Buck Converter for Point-of-Load Application, By A. Ray,D. Kastha, *Int. Conf. Recent Trends in Power, Control and Instrumentation Engineering, PCIE-2013*, Hyderabad, India, (2013)
40. Transient Stability Improvement of SMIB System Using Transient Energy Function Based TCSC, By Teja Bandaru and Dheeman Chatterjee, *International Conference on Power and Energy Systems(ICPS) 2013*, Kathmandu, Nepal, (2013)
41. Voice Cues, Keyboard Entry and Mouse Click for Detection of Affective and Cognitive States: A Case for Use in Technology-Based Pedagogy, By Kabi, B. Samantaray, A. Patnaik, P. Routray, A., *Technology for Education (T4E), 2013 IEEE Fifth International Conference on*, Kharagpur, (2013)
42. Wireless Control of Electro-wetting Device, By Vikram Singh, Siraz Sohail, Asmita Bose, Suman Agarwal, Swetank Ambar and Karabi Biswas, *International Conference on Industrial and Information System 2013*, Kandy, Srilanka, (2013)

## Department of Electronics & Electrical Communication Engineering

### *Head*

Prof. Swapna Banerjee

### *Professors*

Bandyopadhyay, Kalyan Kumar	<i>Ph.D.(Jadavpur University)</i> , satellite communication
Banerjee, Swapna	<i>Ph.D.(IIT Kharagpur)</i> , VLSI based embedded system design for signal/image processing, Biomedical Instrumentation, Device modeling, Low power circuits, Mixed-signal design
Bhattacharyya, Tarun Kanti	<i>Ph.D.(Jadavpur Univ)</i> , MEMS and Microsystems, RF and Analog VLSI, Thinfilms, Nano- electronics, Nano-scale Biosystems Engineering
Biswas, Dhruves	<i>Ph.D. (Illinois USA)</i> , Gallium Nitride based high power RF switches for advanced multi-band front end applications., Integrated product design and development for low cost healthcare delivery system., Business architecture and product development strategies through effective technology interventions, Education enterprise model for developmental entrepreneurship for higher education institution., Social media based reduction of information asymmetry for health care service delivery., Nitride based MOS power devices with insulating heterostructures., Novel InAlN/GaN & AlGaN/GaN heterostructures for resonant tunneling applications., Metamorphic buffer for monolithic integration of compound semiconductor RF devices on Silicon., Nonvolatile memory devices based on metal/insulator/compound semiconductor heterostructures., Graded barrier AlGaN/GaN heterostructures for high power front end application.
Biswas, Prabir Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Image Processing, Computer Vision, Automated Visual Inspection, Multimedia Network, Pattern Recognition, Sensor Network
Chakraborty, Ajoy	<i>Ph.D.(IIT Kharagpur)</i> , EMI/EMC, Electromagnetics, Antennas
Chakraborty, Mrityunjy	<i>Ph.D.(IIT Delhi)</i> , Digital Signal Processing, Adaptive Signal Processing, VLSI Signal Processing, Compressive Sensing
Chattopadhyay, Santanu	<i>Ph.D.(IIT Kharagpur)</i> , Network-on-Chip Design and Test, Low Power Digital Testing, Thermal Aware Testing, Fault Diagnosis
Dhar, Anindya Sundar	<i>Ph.D.(IIT Kharagpur)</i> , VLSI Architecture Design
Dutta, Debasish	<i>Ph.D.(IIT Kharagpur)</i> , Optical Networks, Wireless Networks
Garg, Ramesh	<i>Ph.D.(IIT Kanpur)</i> , Electromagnetics
Maiti, Chinmay Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Microelectronics, Silicon Heterostructures, Online Laboratories, High-k Gate dielectrics, Memristors, Protein Electronics, Technology CAD, Graphene Electronics
Pathak, Sant Sharan	<i>Ph.D.(IIT Delhi)</i> ,
Rajakumar, Ratnam Varada	<i>Ph.D.(IIT Kharagpur)</i> ,

Ray, Ajoy Kumar *Ph.D.(IIT Kharagpur),*

Saha, Goutam *Ph.D.(IIT Kharagpur),* Biomedical Signal Processing, Speech Processing, Audio based Surveillance, Biometric Authentication

Sanyal, Subrata *Ph.D.(IIT Kharagpur),*

Sen Gupta, Somnath *Ph.D.(IIT Bombay),* Computer Vision, Video Coding, Image and Video Processing, Multimedia Communication and Coding, VLSI for Video Coding

***Associate Professors***

Bhattacharya, Amitabha *Ph.D.(IIT Kharagpur),* RF & Microwave Communication

Chakrabarti, Indrajit *Ph.D. (IIT Kharagpur),* VLSI Design for Image and Video Processing and Communication

Datta, Raja *Ph.D.(IIT Kharagpur) ,* Computer Communication and Networks, Mobile Ad Hoc Networks, Optical WDM Networks, Distributed Systems, Wireless Sensor Networks, Inter Planetary Networks

Ghosh, Bratin *Ph.D.(Univ. of Manitoba),* Applied Electromagnetics

Mahapatra, Sudipta *Ph.D.(IIT Kharagpur),* Parallel and Distributed Systems, Video Coding/Video Streaming, Optical and Wireless Networks

Mandal, Pradip *Ph.D.(IISc Bangalore),* Design Automation of CMOS Analog circuits and Systems, On-chip power management system, Analog Interface circuits for high speed data link, Analog circuits for signal acquisition system

Mukhopadhyay, Sudipta *Ph.D. (IIT Kanpur),* Medical Image and Signal Processing, Content based Medical Image Retrieval, Video Processing, Continuous Authentication

Roy, Rajarshi *Ph.D (Brooklyn Univ.),* Communication Networks, Cooperative Communication, Queuing Theory and Stochastic Processes, Optimization and network control, Performance Evaluation and optimal resource allocation problems, Learning and Self-organization and Emergent Phenomena in random environment, Social Networks, Network Coding, Cognitive Radio, Wireless communication and Geometry

***Assistant Professors***

Chakraborty, Paritosh Kumar *Ph.D (IIT Kharagpur),* 1. Solid State Science and Technology, 2. Multi- Valued Logic Algebra and Related Aspects

Dan, Surya Shankar *Ph.D.(IISc., Bangalore),* Computational nanoelectronics, Nano-scale electronic device physics, Simulation study of VLSI devices, Compact analytical modeling of nanoelectronic device operation, TCAD simulator development

De, Arijit *Ph.D.(Syracuse Univ),* Eelectromagnetics, EMI/EMC, RF/Microwave, Digital Signal Processing, Array Processing, Computatioanl Methods

Guha, Prasanta Kumar , Sensor, MEMS, Interface Electronics, Integration with CMOS



	platform, Nano Electronics
Halder, Achintya	<i>Ph.D.(Georgia Tech., Atlanta),</i>
Layek, Ritwik Kumar	<i>Ph.D., Texas A&amp;M Univ., College Station, Bacterial Motility, Whole Cell Modeling and Simulation, Wide-Field Imaging and Cellular Dynamics, Inter-Cellular Interaction, Control in Gene-Protein Regulatory System</i>
Mandal, Mrinal Kanti	<i>Ph.D.(IIT Kharagpur), Microwave circuits</i>
Mohan, Akhilesh	<i>Ph.D.(IIT Kanpur), Microwave Filters, Ultra Wideband Antenna, Metamaterials</i>
Roy, Rajat	<i>Ph.D.(Univ. of Mumbai), Numerical computation of wave functions</i>
Varshney, Shailendra Kumar	<i>Ph.D.(University of Delhi), Quantum optical communication, Speciality fibers-Photonic crystal fibers, Fiber optic sensors, Photonic devices for next generation communication, Plasmonics, Nanophotonics</i>

### ***Faculty Re-employment***

Sudipta Mukhopadhyay      Associate Professor

### ***Brief Description of on-going activities***

The following research activities are currently carried out in the department: a) Biomedical Instrumentation: Main thrust is towards the design and development of an embedded system-on-chip solution for an adaptive intelligent biomedical system. b) Analog/Mixed Signal Design: Currently the research group is engaged in designing of an ADC 0.18 $\mu$ m BiCMOS technology with enhanced performance. c) Computational Electromagnetics and Modelling of Antennas above multilayered ground plane and Microwave Circuits and study of EMI/EMC effects. d) Development of block floating point based schemes for implementing adaptive filters in digital hardware e) Architectural optimization of algorithms for signal processing and wireless communication. f) Automated Visual Inspection of Industrial Objects, VLSI Architecture for low bit rate Video Coding, Medical Image Processing, Gesture Recognition from Video Sequences, Face recognition, Content based Retrieval of Texture Images, Fuzzy Neural Network. g) Fault tolerant design of Network on Chip systems. h) Radar Signal Processing and advanced array processing for subsurface target detection.

### ***Thrust Areas***

1. MEMS & Semiconductor Technology
2. Broadband Communication Networks
3. VLSI Circuits and Systems
4. Design and Development of Embedded Systems for Computer Vision, Image, and Signal Processing
5. Computational modelling of forward and inverse electromagnetic problems and advanced antenna array processing

### ***New Acquisitions***

1. Deep Reactive ion-etching system (DRIE) has been acquired and is being installed in the Dept.

### ***International Collaborations***

Prof. Sébastien Lambot, faculty of Université catholique de Louvain (UCL) Belgium

Prof. Joydeep Bhattacharya, Professor of Psychology at the University of London

Prof. R.M. Rangayyan, Professor, Department of Electrical and Computer Engineering, University of Calgary

Prof. T. K. Sarkar, Syracuse University, NY

### ***Lectures by Visiting Experts***

1. Situation Awareness from Wide - Area Vision Networks *by* Prof. Amit K . Roy - Chowdhury (University of California Riverside, CA 92521)
2. Scratch Pad Memory Managing Local Memory in Software *by* Prof. Preeti Ranjan Panda (Professor, Dept. of Computer Science & Engineering, IIT Delhi)
3. Boolean and Non - Boolean Torque Devices: Prospects and Perspectives *by* Dr. Kaushik Roy (School of Electrical and Computer Engineering, Purdue university)
4. The Problem in Signal Processing *by* Prof. B. Yegnanarayana (IIIT Hyderabad)
5. What are the Challenges in Designing a Robust and Dependable Digital System? *by* Prof. Bhargab B. Bhattacharya (Indian Statistical Institute, Kolkata)
6. Signal Processing in Space - Borne Radar Programmes *by* Tapan Misra (SAC, ISRO, Ahmedabad)
7. Application of Space for the benefit of Society *by* Dr. B. N. Suresh (Vikram Sarabhai distinguished Professor at ISRO HQ)

### ***Doctoral and MS Degrees Awarded***

1. Rohan Mukherjee : High Performance FPGA based VLSI Architecture for H.264 Encoder(MS)
2. Sangita Dhara : Development of transport layer protocol for inter-planetary networks(MS)
3. Praful P. Pai : Non-Invasive Monitoring of Blood Glucose using Photoacoustic Spectroscopy(MS)
4. Israj Ali : Characterization, Detection and Removal of Outliers for Automatic Speaker Recognition(MS)
5. Ayan Kumar Ghosh : Electrical Characterization of High-k Dielectrics on InGaAs Substrates for MOSFET Applications(MS)
6. Debashis Mandal : Prediction and Reduction of Reference Spur in a Frequency Synthesizer(Ph.D.)
7. Jayasree Chakraborty : Computer-Aided Detection of Mammographic Lesions: Masses and Architectural Distortion(Ph.D.)
8. Abhishek Midya : Scene Content Driven Video Error Resilience and Concealment(Ph.D.)
9. Chhandak Mukherjee : Low frequency noise characterization and modeling of strain-engineered MOSFETs' (Ph.D.)
10. Pradip Kumar Sahu : Application Mapping Strategies for Network-on-Chip Topologies(Ph.D.)
11. Uttam Ghosh : SECURE PROTOCOLS FOR MOBILE AD HOC NETWORKS(Ph.D.)
12. Santosh Kumar Patnaik : Design of ADCs for LMDS and UWB Applications: Performance Enhancement through Noise Analysis(Ph.D.)
13. Sajal Sarkar : SECURE AND EFFICIENT ROUTING PROTOCOLS FOR MOBILE AD HOC NETWORKS(Ph.D.)
14. Okade Manish : Camera Motion Estimation, Characterization and Its Applications(Ph.D.)

15. Sanjaykumar C. Gowre : Design of All-Glass Photonic Crystal Geometry for Telecommunication and Sensor Applications(Ph.D.)

#### ***Member - Professional Bodies***

1. Bhattacharyya, Tarun Kanti, *Member* - IEEE
2. Saha, Goutam, *Regular* - IEEE, USA
3. Roy, Rajarshi, *Member* - IEEE
4. Mahapatra, Sudipta, *Life member* - CSI, India
5. Mahapatra, Sudipta, *Member* - IEEE, USA
6. Mandal, Pradip, *Member* - IEEE
7. Chattopadhyay, Santanu, *Member* - IEEE Communications Society
8. Chattopadhyay, Santanu, *Member* - IEEE
9. Chakrabarti, Indrajit, *Member* - IEEE
10. Mukhopadhyay, Sudipta, *Member* - SPIE
11. Mukhopadhyay, Sudipta, *Senior Member* - IEEE
12. Mukhopadhyay, Sudipta, *Member* - Signal Processing Society, IEEE
13. Mukhopadhyay, Sudipta, *Corresponding Member* - RSNA
14. Ghosh, Bratin, *Senior Member* - Institute of Electronics and Electrical Engineers ( IEEE )
15. Datta, Raja, *Senior Member* - IEEE
16. Datta, Raja, *Regular Fellow* - OSI
17. Bhattacharya, Amitabha, *Regular* - IEEE
18. Biswas, Dhruves, *Senior member* - IEEE, Electron Devices Society, Microwave Theory & Techniques Society, Communication Society
19. Varshney, Shailendra Kumar, *Member* - Optical Society of America
20. Varshney, Shailendra Kumar, *Member* - Optical Society of India
21. Varshney, Shailendra Kumar, *Member* - IEEE
22. Halder, Achintya, *Regular* - IEEE
23. De, Arijit, *Member* - IEEE
24. Mandal, Mrinal Kanti, *senior member* - IEEE
25. Mohan, Akhilesh, *Member* - IEEE
26. Chakraborty, Ajoy, *Senior* - SEMCE(I)
27. Chakraborty, Ajoy, *Fellow* - Institute of Engineers
28. Chakraborty, Ajoy, *Senior* - IEEE
29. Banerjee, Swapna, *Senior Member* - IEEE
30. Banerjee, Swapna, *Presidents nominee* - NIT Council
31. Dutta, Debasish, *Senior Member* - IEEE
32. Dutta, Debasish, *Senior Member* - IEEE
33. Maiti, Chinmay Kumar, *Senior Member* - IEEE USA
34. Sanyal, Subrata, *Member* - IEEE
35. Biswas, Prabir Kumar, *Senior Member* - Institute of Electrical and Electronics Engineers, USA
36. Chakraborty, Mrityunjoy, *Member* - IET (formerly IEE, UK)
37. Chakraborty, Mrityunjoy, *Senior Member* - IEEE
38. Garg, Ramesh, *Fellow* - IEEE
39. Garg, Ramesh, *Fellow* - IEEE
40. Bandyopadhyay, Kalyan Kumar, *Fellow* - The Institution of Electronics and Telecommunication Engineers

#### ***Member - Editorial Board***

1. Bhattacharyya, Tarun Kanti (2012) *Editorial board member* - Journal of ISSS
2. Biswas, Prabir Kumar (2009) *Editorial Board Member* - Intl. Journal of Medical Engineering and Informatics

3. Chakraborty, Mrityunjoy (2014) *Editorial board member as a representative of the IEEE Signal Processing Society* - IEEE Journal of Computing in Science and Engineering
4. Chattopadhyay, Santanu (2013) *Member, Editorial Board* - IET Circuits, Devices and Systems (IET-CDS)
5. Dutta, Debasish (0) *Editor* - IEEE Communications Surveys and Tutorials
6. Dutta, Debasish (2013) *Editor* - IEEE Communications Surveys and Tutorials
7. Garg, Ramesh (2012) *Member* - RF & Microwave Computer Aided Engineering
8. Garg, Ramesh (2012) *Member* - IETE J of Education
9. Maiti, Chinmay Kumar (2000) *Guest Editor* - Solid-State Electronics
10. Varshney, Shailendra Kumar (2012) *Editorial board member* - Journal of Photonics

#### ***Awards & Honours***

1. Mukhopadhyay, Sudipta (2012) *Collaborative Research Project for 2012-14*
2. Bhattacharyya, Tarun Kanti (2012) *IBM Faculty Award*
3. Saha, Goutam (2013) *In Top 100 of DST Lockheed Martin India Innovation Growth Program 2013*
4. Layek, Ritwik Kumar (2014) *Open Competitive Grand Challenge Seed Grants (SGIGC), IIT Kharagpur*
5. Varshney, Shailendra Kumar (2014) *OSI best paper award at ICOL, Dehradun*
6. Garg, Ramesh (2013) *Visitors Nominee for NITs*

#### ***Sponsored Research Projects***

1. 3-D Image Sensor for Capturing Minute Surface Details and Visualization by Geometric Modelling (DST, Govt. of India, Rs.30.00 Lakhs)
2. Advanced Adaptive Filtering for Sensor Networks and Sparse System Applications (Indo-Spanish Collaborative Project, Sponsor : DST and MICIIN, Govt. of Spain, Rs.21.00 Lakhs)
3. An embedded low cost portable CW Doppler Ultrasonography System (DST, New Delhi., Rs.24.79 Lakhs)
4. AVLSI Consortium (Multiple Industrial Organisation, Rs.0.00 Lakhs)
5. Bridge Health Monitoring with Wireless Sensor Network (Indian Railways, Rs.193.00 Lakhs)
6. Clinical decision support system and self-learning tool for radiologists for Lung CT using Content Based Image Retrieval (DIT, Rs.99.70 Lakhs)
7. Creation of Multimedia based Courseware for E&IT students to be implemented by IIT Kharagpur (DIT, Rs.115.00 Lakhs)
8. Design & development of non-invasive blood glucose measuring system (Department of Information Technology, Rs.27.00 Lakhs)
9. Design & Fabrication of high sensitivity micro machined Silicon tunneling accelerometer with micro-g resolution (ISRO, IIT Kharagpur Cell 721302, Rs.37.00 Lakhs)
10. Design and Development of high speed miniaturized RF MEMS switched capacitor (ISRO, Rs.19.70 Lakhs)
11. Design and development of specialised antenna for remote communication with submerged devices (ARDE, Pune, Rs.9.76 Lakhs)
12. Design and full-wave Greens Function analysis of the ultrawideband multilayer dielectric resonator antenna (Department of Science and Technology, Rs.54.80 Lakhs)
13. Design of fault-tolerant VLSI systems for applications in satellite communication (ISRO, IIT Kharagpur cell, Space Technology Cell, Rs.37.00 Lakhs)
14. Design of Planar Compact High Performance RF/Microwave Filters for Satellite Applications (ISRO- IIT Kharagpur Cell, Rs.8.94 Lakhs)
15. Design of radiation hardened data converters (ISRO, STC, I.I.T Kharagpur Cell., Rs.31.00 Lakhs)
16. Development and Realization of Silicon Tunneling Accelerometer (ISRO Inertial Systems Unit (IISU), Rs.35.00 Lakhs)

17. Development of a Lung Sound Analyzer (Institute of Pulmocare & Research, Rs.7.00 Lakhs)
18. Development of Interference Mitigation methods through Base Station Cooperation in Next Generation Wireless Broadband Mobile Communication Networks (MCIT, DIT, new Delhi, Rs.90.60 Lakhs)
19. Development of MBE cluster tool based epitaxial nano-semiconductor infrastructure and process integration facility for high performance RF/microwave c (Department of Information Technology, GOI and ATDC, IIT Kharagpur, Rs.4979.92 Lakhs)
20. Development of MEMS based Accelerometers for Aerospace Application (NPMASS) (NPMASS, ADA, Bangalore, Rs.449.00 Lakhs)
21. Development of readout system for Muon system in CBM experiment at FAIR (NSC) (VECC, Kolkata/Govt. of India, Rs.50.00 Lakhs)
22. Development of Remote Centers in Eastern India (MHRD, Rs.106.80 Lakhs)
23. Developmet of MEMS based components for RF applications (NPMASS, Rs.166.00 Lakhs)
24. Digital Electronic Circuits Virtual Laboratory (MHRD, Rs.50.00 Lakhs)
25. Dual-band reconfigurable antenna tunable over a wide range (DEAL, Dehradun, Rs.9.71 Lakhs)
26. Energy Efficient Communication (ISRO, Rs.1.00 Lakhs)
27. Energy Efficient Radio for next generation cellular (VEICET, Rs.185.00 Lakhs)
28. Energy Efficient Routing (ISRO, Rs.0.00 Lakhs)
29. Enhancement of Transport Layer Performance for Inter Planetary Network (Indian Space Research Organization and KCSTC, Rs.11.00 Lakhs)
30. Enhancement of Transport Layer Performance for Inter Planetary Network (ETP) (SAC, ISRO, Rs.5.00 Lakhs)
31. Error Resilient scheme for satellite TV system ( ERS) (ISRO-KCSTC, Rs.5.00 Lakhs)
32. Establishment of Photonics Innovation Lab (Institute (IITKGP), Rs.40.00 Lakhs)
33. Fault Diagnosis Techniques for Yield Enhancement (Synopsys, USA, Rs.25.00 Lakhs)
34. GaN/InGaN based light emitting diodes, solar cells and photoelectrochemical (PEC) devices by MOCVD epitaxial process (Department of Science & Technology, Govt. of India, Rs.657.00 Lakhs)
35. Green Cellular Network (VEICET, Rs.20.00 Lakhs)
36. Implementing a scalable video transcoder based on motion compensated temporal filtering (ISRO, IIT Kharagpur cell, Space Technology Cell, Rs.21.00 Lakhs)
37. INTELLECTUAL PROPERTY EDUCATION, RESEARCH AND PUBLIC OUTREACH (MHRD, Rs.76.70 Lakhs)
38. INTELLECTUAL PROPERTY MAINTENANCE GRANT FOR SPONSORED RESEARCH AND INDUSTRIAL CONSULTANCY (MHRD, Rs.50.00 Lakhs)
39. Iron Disilicide Heterojunction Solar Cells (DST, Rs.15.00 Lakhs)
40. Ka band propagation Experiment over Indian tropical region for improvement of Ka band satellite communication (KPE) (ISRO, Rs.5.00 Lakhs)
41. Ka Band Propagation Experiments over Indian tropical Region for Improvement of Ka Band Satellite Communication (ISRO, IIT Kharagpur Cell, Rs.26.73 Lakhs)
42. MEMS based micropropulsion devices for micro satellite program (ISRO, Rs.123.00 Lakhs)
43. Microelectronics and VLSI Engineering Online Laboratory (MHRD, Rs.100.00 Lakhs)
44. Model Based Error Concealment (ISRO, Rs.0.00 Lakhs)
45. Modulation in Bacterial Chemotaxis: A Systems Biology Approach (SRIC, IIT Kharagpur, Rs.28.00 Lakhs)
46. Multimodal and Multi-scale Imaging for early diagnosis and interventional management of oral pre-cancers and cancer (IIT Kharagpur, Rs.27.00 Lakhs)
47. Multiple Access Array Antenna system at S band using Digital Beam Forming Techniques (DBT) (SAC, ISRO, Rs.5.00 Lakhs)
48. NMEICT-EIT (MHRD, Rs.0.00 Lakhs)
49. Non-invasive blood glucose measurement system: Prototype development, Evaluation & Testing (ICMR, New Delhi, Rs.21.78 Lakhs)
50. Optimal Solutions and Applications for the Next Generation Wireless Internet (VICET-Vodafone, Rs.46.00 Lakhs)

51. Protocol Development for Interplanetary Delay Tolerant Networks (Indian Space Research Organization, Rs.27.98 Lakhs)
52. Railway Bridge Health Monitoring System with Wireless Sensor Networks (Indian Railways, Govt. of India, Rs.187.02 Lakhs)
53. REDUCTION OF FALSE ACCEPTANCE/REJECTION FOR NON-COOPERATIVE SPEAKERS IN AUTOMATIC SPEAKER RECOGNITION SYSTEM (ISRO, Rs.17.40 Lakhs)
54. Remote Triggered Laboratories (MHRD, Rs.48.00 Lakhs)
55. RF MEMS Components (ADA, Bangalore, Rs.187.00 Lakhs)
56. Scalable Video Coder using MCTF (ISRO, Rs.21.00 Lakhs)
57. SIGNALS & SYSTEMS FOR LIFE SCIENCE (MHRD, Rs.2000.00 Lakhs)
58. Smart low power thermal accelerometer for CMOS MEMS platform (DST, Rs.15.25 Lakhs)
59. Special Manpower Development Programme for VLSI Design & related Software (Ministry of Communication and Information Technology, New Delhi, Rs.145.27 Lakhs)
60. Specialized antenna for communication through metallic enclosure (ARDE, Pune, Rs.25.32 Lakhs)
61. Strategies for Thermal-Aware Network-on-Chip Design (Dept. of Science & Technology, Govt. of India, Rs.25.03 Lakhs)
62. Studies on construction & performance evaluation of MBOS modulation for improved satellite navigation radio signal and system design (CPE) (ISRO-LCSTC, Rs.5.00 Lakhs)
63. Studies on GPR Wave Propagation through Soil (LRDE, Bangalore, DRDO, Rs.9.95 Lakhs)
64. Studies on New Modulation Techniques for Satellite Navigation (ISRO, Rs.0.00 Lakhs)
65. Studies on Retro-Directive Array for Space Applications( RAA ) (ISRO, Bangalore, Rs.33.47 Lakhs)
66. Study of CDMA codes for satellite navigation (SCN) (ISRO-KCSTC, Rs.5.00 Lakhs)
67. Study on Different Aspects of Secured Quantum Communication (SAC, ISRO, Rs.1.20 Lakhs)
68. Suitability of Free Space Optical Communication link for On Board Data Handling (OBDH) in Satellite (SAC, ISRO, Rs.31.00 Lakhs)
69. Synthesis of functional groups for immobilization of functional proteins on MEMS based micro-sensor surfaces (Indo-Trento Program for Advanced Research, Rs.164.00 Lakhs)
70. Synthesis of satellite footprints patterns from planar array antennas by combination of particles swarm optimization and FFT (ISRO, Rs.16.80 Lakhs)
71. Teachers Empowerment, Student Empowerment and Integration of Tools for Improvement - Synchronous Delivery (Train 10K Teachers) (MHRD, Rs.6600.00 Lakhs)
72. Teachers Empowerment, Student Empowerment and Integration of Tools for Improvement- Synchronous Delivery (MHRD, Rs.0.00 Lakhs)
73. Technology Business Incubation (TBI) (Department of Science and Technology, GOI and SRIC, IIT Kharagpur, Rs.20.00 Lakhs)
74. Technology CAD (TCAD) Online Laboratory (MHRD, Rs.50.00 Lakhs)
75. Test Simulator for Satellite Based AIS (TSS) (SAC, ISRO, Rs.7.00 Lakhs)
76. Thermal Aware Testing of VLSI Circuits and Systems (Dept. of Information Technology, Govt. of India, Rs.49.91 Lakhs)
77. TRACKING OF ULTRASONOGRAPHY MACHINES TOWARDS PREVENTION OF ITS MISUSE (Ministry of Health and Family Welfare, Rs.50.00 Lakhs)
78. Upgrading Facilities for MEMS design activities at National resource centre (NPMASS, ADA, Bangalore, Rs.36.00 Lakhs)
79. Virtual Lab Simulation - Digital Electronic Circuits (MHRD, Rs.50.00 Lakhs)
80. Virtual Lab Simulation - Digital Signal Processing Lab. (MHRD, Rs.50.00 Lakhs)
81. Whole Cell Modeling and Simulation in Bacterium Escherichia Coli (SRIC, IIT Kharagpur, Rs.250.00 Lakhs)

### ***Consultancy Projects***

1. CHECKING BORDER VIOLATION BY CIVILIANS THROUGH TECHNOLOGICAL SOLUTIONS: Phase I (BSF, Rs.3.06 Lakhs)
2. Design of monopulse Ka-band antenna and waveguide system (VEM Technologies Ltd., Hyderabad, Rs.10.25 Lakhs)
3. Design of switch capacitor based embedded DC-DC buck converter (Maxim India Integrated Circuit Pvt. Ltd., Rs.10.32 Lakhs)
4. Developing Pedagogical Methods (Subject: Network Theory) (MHRD, Govt. of India, Rs.2.00 Lakhs)
5. Hardware/Software Integrated Approach to Next Generation Video Conferencing System (Intellisys Technologies and Research Limited, Rs.0.00 Lakhs)
6. Physics formulation of a liquid dielectric characterization setup (GE India Technology Centre Pvt. Ltd., Bangalore, Rs.10.00 Lakhs)
7. Real Time Image Processing for Conveyor Belt Health Monitoring (PHOENIX Conveyor Systems, Rs.22.00 Lakhs)
8. Studies on GPR wave Propagation through Soil (LRDE, DRDO, Rs.1.72 Lakhs)

### ***Patents (filed / granted)***

1. A CALLER AUTHENTICATION SYSTEM FOR COMPUTER BASED VOIP CALLS
2. A LOW-COST BIOMETRIC AUTHENTICATION SYSTEM FOR ONLINE CERTIFICATION COURSE
3. An Energy and QoS Aware Method for Vertical Handover among Heterogeneous Wireless Networks
4. An Improved Molecular Beam Epitaxy Multi Chamber Cluster Tool And Processes For Integration Of Multiple Growth Combination Of Group III-V Semiconductor Heterostructures
5. An integrated automated system for assessing and monitoring the cardiac status and pulse rate
6. DISTRIBUTED BINARY CELL REALIZING HYBRID CURRENT STEERING ARCHITECTURE BASED DIGITAL TO ANALOG CONVERTER
7. Fiber optic corrosion sensor
8. Heart Sound Analyzer
9. Lung Sound Analyzer
10. Method of video coding the movement of a human face from a sequence of images
11. Methods of loop bandwidth calibration and phase noise cancellation circuits in a fractional -N PLL with a special switching charge pump circuit to reduce the leakage current, o/p noise and spur
12. Stripline fed printed sandwich monopole antenna
13. System and method for frequency calibration of oscillators involving fraction phase
14. SYSTEM AND METHOD FOR NON-INVASIVE MEASUREMENT OF CONCENTRATION OF ANALYTES IN A BIOLOGICAL SAMPLE
15. System and method for non-invasive measurement of concentration of analytes in a biological sample
16. Uniaxial MEMS piezoresistive accelerometer with enhanced cross axis signal rejection

### **Visits Abroad by Faculty Members**

1. Mukhopadhyay, Sudipta - To present posters in conference (San Diego, USA, ) 15-20 th February 2014
2. Datta, Raja - To present a research paper in IEEE Wireless Communications and Networking Conference (WCNC) (Sanghai, China, ) April 7 to April 10, 2013
3. Mukhopadhyay, Sudipta - Biotechnology Industry Research Council delegation in Indo-TEKES workshop (Helsinki , Finland, ) 10-12th September 2013

4. Bhattacharyya, Tarun Kanti - Invited Speaker (City College of New York (CCNY), ) November 2013
5. Bhattacharyya, Tarun Kanti - Session Chair and Paper Presentation (Baltimore, MD, USA, ) November 2013
6. Saha, Goutam - Attending IEEE Conference ICASSP 2013 (Vancouver, Canada, ) May 28-31, 2013
7. Banerjee, Swapna - To attend the International Conference on 20th Reconfigurable Architectures Workshop (RAW 2013) (Boston, USA, ) May 20-21, 2013
8. Roy, Rajarshi - SNOW, 2013 workshop (Akashoteli, Akasolompolo, Yllas (Near Kolari), Lapland, Finland., ) 2-6 April, 2013
9. Roy, Rajarshi - To present paper in ICC, 2013 conference. (Budapest, Hungary, ) Journey cancelled. Flood like situation in Budapest. Attended by student co-author by Microsoft grant

#### **Invited Lectures by Faculty Members**

1. Mechatronics, Robotics and Automation *by* Banerjee, Swapna (NCMRA-2014, Bankura Unnayani Institute of Engineering, Bankura, West Bengal.)
2. Advances in Microelectronics, VLSI Design and Optoelectronic Devices with Mixed Signal Processing *by* Banerjee, Swapna (Narula Institute of Technology, Kolkata.)
3. Embedded Bio-medical System *by* Banerjee, Swapna (Kalyani Govt. Engineering College, Kalyani, Nadia, West Bengal)
4. Are We Listening Enough? *by* Saha, Goutam (Symposium on Science and Society Organized by INSA Local Chapter, Kharagpur)
5. Are We Listening Enough? *by* Saha, Goutam (International Conference on Electronics Engineering & Computer Science, Kolkata)
6. Listening to Heart and Lung Sound *by* Saha, Goutam (Workshop on Advances in Healthcare Engineering, Kolaghat)
7. Nano-enabled Microsensors and Actuators *by* Bhattacharyya, Tarun Kanti (Indian Statistical Institute, Kolkata)
8. Nanoengineered Microsensors (Keynote Address) *by* Bhattacharyya, Tarun Kanti (Jadavpur University)
9. Nanostructures, Sensors and Actuators *by* Bhattacharyya, Tarun Kanti (City College of New York (CCNY))
10. Signal Processing For Appreciation of Heart and Lung Sound *by* Saha, Goutam (National Conference on Applied Electronics, Kolkata)
11. QoS Aware Fuzzy Rule Based Vertical Handoff Decision Algorithm for Heterogeneous Wireless Networks *by* Mahapatra, Sudipta (IGIT Sarang)
12. New Designs, New Avenues: From Optical Fibers to On-Chip Applications *by* Varshney, Shailendra Kumar (IIT Delhi)
13. Efficient Antennas for Microwave Communication *by* Ghosh, Bratin (Shri Sant Gajanan Maharaj College of Engineering, Shegaon, Buldhana)
14. Control and Management of Optical Networks *by* Datta, Raja (Kolaghat Engineering and Management Institute, Kolaghat)
15. Real-time system design *by* Chattopadhyay, Santanu (Kalyani Govt. Engineering College)
16. Advanced Communication Technologies *by* Bhattacharya, Amitabha (Department of Electronics, Vidyasagar University, Midnapur)
17. Antennas for UWB Communication *by* Bhattacharya, Amitabha (NIT, Durgapur)
18. Mammogram CAD *by* Mukhopadhyay, Sudipta (Department of Information Technology, National Institute of Technology, Durgapur)
19. Mammogram CAD *by* Mukhopadhyay, Sudipta (Department of Information Technology, Kalyani Govt Engg College)
20. Video rain removal *by* Mukhopadhyay, Sudipta (Computer Science Department, NITTR Chandigarh)



21. Modeling and Control in Gene-Protein Regulatory System *by* Layek, Ritwik Kumar (Short term course on Computational Biology, Bioinformatics Their Application to Healthcare, IIT Kharagpur, India)
22. Pathways, Networks and Therapy: A Boolean Approach to Cancer *by* Layek, Ritwik Kumar (IEEE Indo-Brazil Workshop on Biomedical Informatics, IIT Kharagpur, India)
23. Decoding the Dynamics of Gene-Protein Regulatory Systems *by* Layek, Ritwik Kumar (College of Engineering and Management, Kolaghat, WB, India)
24. Panelist in IT for Rural Health *by* Datta, Raja (SRM University,)
25. Advances in Networking Technologies *by* Datta, Raja (NERIST, TEQIP,)
26. Communication Networks for Smart Grid *by* Datta, Raja (CESC, Kolkata)
27. Recent Trends in Networking *by* Datta, Raja (NSTL, Visakhapatnam)
28. Ad Hoc Networks *by* Datta, Raja (ECIL, Hyderabad)
29. Recent trends in wireless communication research. *by* Roy, Rajarshi (BESU, Shibpur, Howrah)

### ***Books Published***

1. Avik Dutt and S.K. Varshney: Capillary Optical Fibers: Design and Applications *published by* LAP LAMBERT Academic Publishing (2012)
2. C. K. Maiti and G. A. Armstrong: Applications of Silicon-Germanium Heterostructure Devices *published by* Institute of Physics Publishing (IOP), UK (2001)
3. C. K. Maiti and T. K. Maiti: Strain-Engineered MOSFETs *published by* CRC Press (Taylor and Francis), USA (2012)
4. C. K. Maiti, Editor: Selected Works of Professor Herbert Kroemer *published by* World Scientific, Singapore (2008)
5. C. K. Maiti, N. B. Chakrabarti and S. K. Ray: Silicon Heterostructures: Materials and Devices *published by* Institute of Electrical Engineers (IEE), UK (2001)
6. C. K. Maiti, S. Chattopadhyay, and L. K. Bera: Strained-Si Heterostructure Field-Effect Devices *published by* CRC Press (Taylor and Francis), USA (2007)
7. G. A. Armstrong and C. K. Maiti: TCAD for Si, SiGe and GaAs Integrated Circuits *published by* The Institution of Engineering and Technology (IET), UK (2008)
8. Herbert Taub, Donald L Schilling, Goutam Saha: Principles of Communication Systems, 4th Edition *published by* McGraw Hill Education (2013)
9. R. Garg, I. Bahl, and M. Bozzi: Microstrip Lines and Slotlines, Third Edition *published by* Artech House (2013)
10. S. C. Mahapatra and Sudipta Mahapatra: Principles of Electromagnetics *published by* McGraw Hill, India (2014)
11. S.K. Varshney and S.K. Verma: Book chapter Optical wavelength demultiplexer based on photonic crystal architecture in Photonic Crystals: features and Applications *published by* Nova Publishers (2013)

### ***Short-Term Courses, Training Programmes and Workshops organised***

1. Advanced DSP Design Techniques (June 27 - July 1, 2013)
2. Electromagnetic Environmental Effects Management (E3) (Feb 17 - Feb 27, 2014)
3. One week Coordinator workshop on Fluid Mechanics (March 11 to March 15, 2014)
4. One week Coordinator workshop on Signals and Systems (September 30 to October 4, 2013)
5. One week Coordinators Workshop on Analog Electronics (April 1-5, 2013)
6. Short term course on computation systems biology (31 March - 4 April, 2014)
7. Short Term Course on Telecom Networks with State-of-the-art Hands-on Experiments (8th July to 13th July 2013)
8. Two Week ISTE Main workshop on Analog Electronics (June 4-14, 2013)
9. Two Week ISTE Main workshop on Signals and Systems (January 2 to January 12, 2014)
10. VLSI Signal Processing (Dec. 3-7, 2013)

### ***Papers Published in Journals***

1. A high o/p resistance, wide swing and perfect current matching charge pump having switching circuit for PLL By Manas Kumar Hati and Tarun Kanti Bhattacharyya *Microelectronics Journal* 44, 649-657 (2013)
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54. Green cooperative communication techniques for Intelligent transportation systems, By M. Vinod Kumar, Swaminathan R., and Rajarshi Roy, *IEEE ISPPCC*, JUIT, Wakhnaghat, Shimla, HP, India., (2013)
55. Growth and characterization of band gap engineered InGaAs/InAlAs/GaAs high electron-mobility quantum well structure towards low leakage VLSI applications, By U. P. Gomes, Y. Chen, Y.K. Yadav, S. Ghosh, S. Chowdhury, P. Mukhopadhyay, P. Chow and D. Biswas, *CSMANTECH 2013*, New Orleans, Louisiana, USA, (2013)
56. Growth and Characterization of Epitaxial Buffer Optimized MBE Grown AlGaIn/GaN and InAlN/GaN Heterostructure on Si (111) Substrate for Resonant Tunneling Applications, By S. Chowdhury, B. Borisov, P. Chow and D. Biswas, *56th Electronic Materials Conference (EMC)*, Santa Barbara, California, USA, (2014)



57. Hexagonal Shaped Fractal UWB Antenna, By Shrivishal Tripathi, Akhilesh Mohan, Sandeep Yadav, Vivek Vijay, and Ambesh Dixit, *Applied Electromagnetic Conference (AEMC)2013 IEEE International Conference on*, , (2013)
58. Information Asymmetry Minimization System for Potential Clients of Healthcare Insurance in Indian Context using Semantic Web, By Sreekanth Vettikkadu and Dhruves Biswas, *IEEE TechSym 2014 Conference*, , (2014)
59. InP Quantum Dots based Nano Heterostructure Infrared Detector Si (100), By N. H. Halder, D. Biswas & P. Banerji, *56th Electronic Materials Conference (EMC)*, Santa Barbara, California, USA, (2014)
60. Low frequency noise in polycrystalline p-β-FeSi<sub>2</sub>/Geheterojunction solar cells, By Bag, A., Mukherjee, C., Mallik, S., Maiti, C.K., *IPFA*, Singapore, (2013)
61. Methods for the Detection of Blood Vessels in Retinal Fundus Images and Reduction of False-Positive Pixels Around the Optic Nerve Head, By Ashis K. Dhara, Rangaraj M. Rangayyan, Faraz Oloumi, Sudipta Mukhopadhyay, *4th IEEE International Conference on E-Health and Bioengineering - EHB 2013*, Iasi, Romania, (2013)
62. Modeling Social Media Network For Effective Healthcare In Emerging Economies Semi-Urban/Urban Context, By Amrita, Sreekanth Vettikkadu and Dhruves Biswas, *IEEE Global Humanitarian Technical Conference (GHTC 2013)*, San Jose, California USA, (2013)
63. Multi classifier framework for lung tissue classification, By Jatindra Kumar Dash, Sudipta Mukhopadhyay, Mandeep Kumar Garg, Nidhi Prabhakar, Niranjana Khandelwal, *IEEE TechSym 2014*, IIT Kharagpur, India, (2014)
64. Noise-enhanced Contrast Stretching of Dark Images in SVD-DWT domain, By Rajlaxmi Chouhan, Rajib Kumar Jha, Prabir Kumar Biswas, *IEEE India Conference (INDICON)*, Mumbai, India, (2013)
65. Novel MICS Band Implantable Antenna for WBAN Applications, By Umesh Tanwar, Shrivishal Tripathi, Kapil Lahuwa, Akhilesh Mohan, Ambesh Dixit, *India Antenna Week 2013*, , (2013)
66. Optical Parametric Amplification in Chalcogenide Step Index Fiber over Infrared Region, By S. Singh, S. Varshney, and P. Datta, *Photonics 2012*, IIT Madras, (2012)
67. Performance Evaluation of Reliability Aware Photonic Network-on-Chip Architectures, By P. K. Kaliraj, P. Sieber, A. Ganguly, I. Datta and D. Datta., *Third International Green Computing Conference, IGC*, San Jose, California, USA, (2012)
68. Physics-based compact lumped circuit model of PIFE using a retarded partial element equivalent circuit, By R bhattacharya, S Srikanth, R Garg, TK Bhattacharyya, *IEEE Asia-Pacific Conference on Antennas and propagation(APCAP)*, , (2012)
69. Preemptive Test Scheduling for Network-on-Chip Using Particle Swarm Optimization, By Kanchan Manna, Shailesh Singh, Santanu Chattopadhyay, Indranil Sengupta, *VLSI Design and Test Symposium*, Jaipur, India, (2013)
70. Reconfigurable Architecture of a RRC FIR Interpolator for Multi-Standard Digital Up Converter, By Indranil Hatai, Indrajit Chakrabarti and Swapna Banerjee, *20th Reconfigurable Architectures Workshop (RAW 2013)*, Boston, USA, (2013)
71. Reconfigurable Architecture of a RRC FIR Interpolator for Multi-Standard Digital Up-Converter, By I. Hatai, I. Chakrabarti and S. Banerjee, *20th Reconfigurable Architectures Workshop (RAW) associated with 27th Annual International Parallel and Distributed Processing Symposium (IPDPS 2013)*, Boston, USA, (2013)
72. Selective suppression of the fundamental mode in a dual-mode photonic crystal fiber, By A. Maity and S. Varshney, *Photonics 2012*, IIT Madras, (2012)
73. Shape Recognition based on Shape-Signature Identification and Condensibility: Application to Underwater Imagery, By Jeet Banerjee, Ranjit Ray, Sivarama Krishna Vadali, Ritwik Layek and Sankar Nath Shome, *NCVPRIPG*, Jodhpur, India, (2013)
74. SOI CMOS Integrated Zinc Oxide Nanowire for Toluene Detection, By S Santra, P K Guha , S K Ray, F Udrea, J W Gardner, *NEC 2013*, Singapore, (2013)
75. Sparse Adaptive Filtering by Iterative Hard Thresholding, By Rajib Lochan Das and M. Chakraborty, *APSIPA ASC 2013*, Kaohsiung, Taiwan, (2013)

76. Spectral compatibility of BOC(5,2) modulation with existing GNSS signal, By S. B. Sekar, S. Sengupta, K. Bandyopadhyay, *Position Navigation and Location Symposium (PLANS)*, Myrtle Beach, South Carolina, (2012)
77. Spurs Suppression in frequency Synthesizer using switched capacitor array, By Debashis Mandal, Pradip Mandal and T K Bhattacharyya, *IEEE International SoC Design Conference*, , (2012)
78. Symmetry breaking oscillations in electrostatic MEMS under super harmonic excitation, By Anindya Lal Roy and Tarun Kanti Bhattacharyya, *IEEE SENSORS*, Baltimore, MD, USA, (2013)
79. Synthesis of thinned uniformly-excited time-modulated linear arrays using an improved invasive weed optimization algorithm, By R Bhattacharya, S Saha,TK Bhattacharyya, *IEEE Antennas and propagation Society International Symposium (APSURSI)*, , (2012)
80. The Charge Trapping Effect in Amorphous SiliconNitride (Si<sub>3</sub>N<sub>4</sub>) Thin Film Based MIS Device, By Syed MukulikaDinara, Ankush Bag, Nripendra N. Halder, Sekhar Bhattacharya, P. Banerji and D. Biswas, *Joint Physics Symposium(ISJPS-2013)*, IIT Kharagpur, (2013)
81. Theory and design of off-axis microring resonators based compact band pass filter for on-chip applications, By R. Haldar, S. Das and S.K. Varshney, *Frontier in Optics/Laser Science (FiO/LS)*, Orlando, USA, (2013)
82. Thermal Aware Dont Care Filling to Reduce Peak Temperature and Thermal Variance during Testing, By Arpita Dutta, Subhadip Kundu, Santanu Chattopadhyay, *Asian Test Symposium*, Taiwan, (2013)
83. Threading Dislocations in GaN HEMTs on Silicon: Origin of Large Time Constant Transients?, By Saptarsi Ghosh, Ankush Bag, Partha Mukhapadhyay, Syed Mukulika Dinara, Sanjay .K. Jana, Sanjib Kabi, and Dhruves Biswas, *CSMANTECH*, , (2014)
84. Unconventional growth of silver nano-particle assisted InP nano-wires on Si (100) by vapor-solid-solid process, By Nripendra N. Halder, Sisir Chowdhury, P. Banerji, Mainak Palit, S. Chottopadhyay and D. Biswas, *17th International Conference on Metalorganic Vapor Phase Epitaxy*, Lausanne, Switzerland, (2014)
85. Unloaded quality factor of a substrate integrated waveguide resonator and its variation with the substrate parameters, By Arani Ali Khan, Mrinal Kanti Mandal, Subrata Sanyal, *IEEE Microwave and Photonics (ICMAP)*, Dhanbad, (2012)
86. Utilizing Graph Sampling and Connected Dominating Set for Backbone Construction in Wireless Multimedia Sensor Networks, By Ravindara Bhatt and Raja Datta, *Twentieth National Conference on Communications (NCC 2014)*, IIT Kanpur, India, (2014)
87. Wavelet based rotation invariant texture feature for lung tissue classification and retrie, By Jatindra Kumar Dash, Sudipta Mukhopadhyay, Mandeep Kumar Garg, Nidhi Prabhakar, Niranjana Khandelwal, *SPIE Medical Imaging*, San Diego, USA, (2014)

## Department of Geology & Geophysics

### **Head**

Prof. Debashish Sen Gupta

### **Professors**

Bhattacharya, Abhijit	<i>Ph.D.(IIT Kharagpur),</i>
Bhattacharya, Amit Kumar	<i>Ph.D.(IIT Kharagpur),</i>
Bhowmik, Santanu Kumar	<i>Ph.D.(Jadavpur Univ), Metamorphic Petrology, Geochronology</i>
Das, Subhasish	<i>Ph.D.(IIT Kharagpur), Sedimentology, Basin Tectonics</i>
Gupta, Anil Kumar	<i>Ph.D.(BHU, Varanasi),</i>
Gupta, Saibal	<i>Ph.D.(Cantab), Structural Geology, Metamorphic Petrology, Tectonics</i>
Mamtani, Manish A	<i>Ph.D.(MSU, Baroda), Structural Geology, Microtectonics</i>
Mishra, Biswajit	<i>Ph.D.(IIT Kharagpur), Ore Geology Experimental Sulfide Mineralogy Metamorphic Petrology</i>
Mohanty, William Kumar	<i>Ph.D.(Delhi Univ.), Seismology, Seismic Hazard Assessment, Gravity &amp; Magnetic Methods of Prospecting, Reservoir Characterization</i>
Nath, Sankar Kumar	<i>Ph.D.(IIT Kharagpur), Earthquake and Engineering Seismology, Seismic Hazard Vulnerability &amp; Risk Assessment and Microzonation, Seismic Prospecting, Geophysical Signal Processing, Geophysical Tomography, Computational Geophysics, Sequence Stratigraphy, Hydrocarbon Exploration</i>
Panigrahi, Mruganka Kumar	<i>Ph.D.(IIT Kharagpur), Economic Geology, Crustal Fluids, Computer Applications</i>
Sarkar, Anindya	<i>Ph.D (Gujrat Univ.), Stable Isotope Geochemistry, Sedimentology, Palaeoclimatology</i>
Sen Gupta, Debashish	<i>Ph.D.(PRL, Ahamdabad), Resource Evaluation of Unconventional Hydrocarbons and Modeling for TENORM &amp; NORM evaluation</i>
Sharma, Shashi Prakash	<i>Ph.D.(BHU, Varanasi), Electrical and EM Geophysics, Integrated Geophysical Research, Modeling and Inversion, Groundwater Geophysics</i>
Tripathy, Subhasish	<i>Ph.D.(IIT Bombay), Environmental Geochemistry, Waste Utilization</i>

### **Associate Professors**

Basu, Arindam	<i>Ph.D.(The Univ. of Hong Kong), Rock Mechanics, Engineering Geology</i>
Ray, Sanghamitra	<i>Ph.D.(Calcutta Univ), Vertebrate paleobiology, Gondwana stratigraphy and sedimentation</i>

### **Assistant Professors**

Bera, Melinda Kumar	<i>Ph.D.(IIT Kharagpur), Sedimentology, Sequence Stratigraphy, Stable Isotope Geochemistry, Paleoclimate</i>
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Kumari, Sudha	<i>Ph.D.</i> , Application of electrical and electromagnetic methods to environmental problems, Modeling and Inversion, Helicopter-borne electromagnetics (for imaging shallow earth structures), Joint inversion of electrical and electromagnetic methods
Maiti, Sabyasachi	<i>Ph.D.(IIT Kharagpur)</i> , Remote Sensing, Geographic Information System, Quantitative Geomorphology
Mukherjee, Abhijit	<i>Ph.D.(Univ. of Kentucky, USA)</i> , Surface water-sea water-groundwater interaction, Mine-site hydrology, Physical Chemical and Isotope Hydrogeology, Contaminant Fate and Transport, Environmental Geochemistry, Effect of Climate Change, Modeling (groundwater flow and transport geochemical hydrostratigraphy and geosystems)
Pruseth, Kamal Lochan	<i>Ph.D.(IIT Kharagpur)</i> , Sulfide Phase Equilibria, Experimental Petrology, Ore Geology
Sengupta, Probal	<i>Ph.D.(IIT Kharagpur)</i> , Seismology, Geoexploration, Seismic prospecting, Near surface geophysics
Singh, Arun	<i>Ph.D.(NGRI)</i> , Seismic anisotropy: Mantle deformation Patterns, Lithospheric Structure and geodynamics, Teleseismic tomography
Singh, Chandrani	<i>Ph.D.(NGRI)</i> , Reservoir Triggered Seismicity, Attenuation characteristics of seismic waves, Seismotectonics
Upadhyay, Dewashish	<i>Ph.D.(Univ. of Bonn, Germany)</i> , Geochemistry, Igneous Petrology, Cosmochemistry

#### ***Faculty Appointments***

Sudha	Assistant Professor
Dr. Melinda Bera	Assistant Professor
Dr. Sabyasach Maiti	Assistant Professor
Dr. Ravikant Vadlamani	Associate Professor

#### ***Brief Description of on-going activities***

Tectonic evolution of craton – mobile belt ensembles in parts of the Indian shield; Gold mineralization in greenstone belts of Dharwar Craton; Metamorphic remobilization of massive sulphide deposits; Studies on Indian microvertebrates, Lithospheric structure across Himalaya, Deformation at Collisional boundaries, Stable isotopes in Himalayan foreland sediments; Paleogene climate of Kutch, Rajasthan, Environment in ancient sedimentary basins in India; Seismic Hazard assessment and microzonation in the NE India and metropolitan cities, Improvement of rock index test methods and mechanical characterization of rock materials, Groundwater potential assessment and pollution by natural and anthropogenic causes; Waste utilizations, wasteland development and acid marine drainage; Natural radiation hazard estimation. Studies on Indian monsoon (both modern and ancient) and paleoclimate studies of the Indian subcontinent and paleoceanography of the Indian Ocean.

#### ***Thrust Areas***

1. Seismology

2. Paleoclimatology (Paleontology, Geochemistry)
3. Crustal Evolution and Metallogeny
4. Environmental Hazards and Mitigation

### ***New Acquisitions***

1. Two Stable Isotope Ratio Mass Spectrometers (IRMS) from the Institute Diamond Jubilee Fund. The Thermo-Finnigan MAT-253 equipped with dual inlet port and eight collectors are capable of measuring carbon isotopes. In addition the Laser Fluorination system would enhance the capability of the instrument for measuring oxygen isotopic composition in silicates. The newly supplied conFlo IV attached with the Delta V can be used for measuring C, H, N, O, S isotopic composition in solid and liquid samples.
2. State of Art MC-ICPMS Laboratory
3. Ground Penetration Radar System (GSSI SIR-3000) with multi-low frequency (16-80 MHz) and 2000 MHz Bistatic antennas for geo-exploration.
4. Low level Portable Gamma NaI(Tl) based gamma ray scintillation equipment.

### ***International Collaborations***

NASA, Caltech and University of California-Irvine: Satellite-based ground water estimation of India subcontinent

Royal Institute of Technology (KTH), Sweden: Global ground water Arsenic

British Geological Survey: Resilience to Climate Change Indus-Ganges-Brahmaputra plain.

### ***Lectures by Visiting Experts***

1. Application of multifractals in Structural Geology *by* Prof. Alison Ord (University of Western Australia)
2. Critical mineralising plumbing systems *by* Prof. Alison Ord (University of Western Australia)
3. Origin of platinum group of element mineralization in Ural-Alaskan type mafic-ultramafic complexes, southeastern Alaska *by* Dr. Joyashish Thakurta (Department of Geosciences, Western Michigan University, USA)
4. Gravimetry-advances and perspectives for geodetic reference frames and earth system monitoring *by* Prof. Jakob Flury (Leibniz Universitat Hannover, Germany)
5. Volatiles in magma-from laboratory studies towards understanding of volcanic eruptions *by* Prof. Harald Behrens (Leibniz Universitat Hannover, Germany)
6. Environmental Service: Need for more Near Surface Geoscience *by* Prof. R.N. Singh (Emeritus Professor, National Geophysical Research Institute, Hyderabad)
7. Mars for earthlings: Using earth analogs to decode the sedimentary history of Mars *by* Prof. Marjorie Chan (Department of Geology & Geophysics, University of Utah, USA)

### ***Doctoral and MS Degrees Awarded***

1. Suraji Misra : Structural analysis of the Rengali Province and implications for tectonic evolution of the eastern Indian shield(Ph.D.)
2. Prabhakar Narega : Archean and Neoproterozoic structure, metamorphic phase equilibria and monazite geochronology in and across the Sighbhum Craton, Eastern India(Ph.D.)
3. S. Rekha : Tectonics of paleoproterozoic to mesoarchean crystalline rocks along the western (Konkan) coast, India: relevance to Gondwana Land and Columbia supercontinent(Ph.D.)
4. Deshraj Trivedi : Estimation of effective elastic thickness in Indian Shield and southwest Indian Ocean Ridge(Ph.D.)

5. Animesh Mandal : Integrated geophysical studies for delineation of subsurface structures and mineral deposits in the eastern Indian shield(Ph.D.)
6. Saurabh Mittal : Very low frequency electromagnetic and radiometric studies around south Purulia shear zone for the investigation of possible uranium minerals(Ph.D.)
7. Samita Biswal : Radiogenic heat production, geochemistry and fluid inclusion studies on granulites around Angul, Eastern Ghat Belt, India(Ph.D.)
8. Arindam Dutta : Tectonic evolution of the Bastar Craton-Eastern ghats mobile belt-Rengali province tr-junction, India(Ph.D.)
9. Arkoprovo Biswas : Identification and resolution of ambiguities in interpretation of self-potential data: analysis and integrated studies around south Purulia shear zone, India()
10. DeepaK Amban Mishra : Evaluation of the uniaxial compressive and indirect tensile strengths of granite, schist and sandstone by index tests and microstructural analysis(Ph.D.)

### ***Member - Professional Bodies***

1. Sarkar, Anindya, *Member* - Indo-US organizing committee on frontiers of science, 2009
2. Sarkar, Anindya, *Member* - Research Advisory Council, Birbal Sahni Institute, Lucknow, 2008-09
3. Sarkar, Anindya, *Member* - Search and selection committee, Presidency University, 2011-12
4. Sarkar, Anindya, - *Member*, PAMC, Ocean Science and Resources, MOES, 2012
5. Sarkar, Anindya, *Member* - International Geological Correlation Program (IGCP) Project
6. Sarkar, Anindya, - *Member*, PAMC, Earth Science, DST, 2012
7. Sarkar, Anindya, *Member* - Indian Society of Mass Spectrometry
8. Mohanty, William Kumar, *Life Member* - Society of Petroleum Geophysicists
9. Ray, Sanghamitra, *Member* - Society of Vertebrate Paleontology, USA
10. Ray, Sanghamitra, *Member* - The Palaeontological Association, UK
11. Basu, Arindam, *Member* - International Society for Rock Mechanics (through the National Group of India)
12. Basu, Arindam, *Life Member* - Indian Society of Engineering Geology (Indian National Group of International Association for Engineering Geology and Environment)
13. Upadhyay, Dewashish, *Life member* - Geological Society of India
14. Upadhyay, Dewashish, *Member* - European Association of Geochemistry
15. Pruseth, Kamal Lochan, *Member* - European Association of Geochemistry
16. Mukherjee, Abhijit, - Geological Society of America
17. Mukherjee, Abhijit, - International Association of Hydrogeologists
18. Mukherjee, Abhijit, *Life Member* - Indian Science Congress Association
19. Maiti, Sabyasachi, *Member* - Indian Society of Geomatics
20. Mishra, Biswajit, *Life Fellow* - Geological Society of India
21. Mishra, Biswajit, *National representative* - IMA-COM (International Mineralogical Association-Commission on Ore Mineralogy)
22. Nath, Sankar Kumar, *Senior Life Fellow* - Life Fellow (No.236): The Geological, Mining and Metallurgical Society of India (GMMSI)
23. Nath, Sankar Kumar, *Senior Fellow* - Life Fellow: The Society of Geoscientists and Allied Technologists (SGAT).
24. Nath, Sankar Kumar, *Regular Member* - Member Registration No. 8810 : The Mining Geological & Metallurgical Institute of India (MGMI)
25. Nath, Sankar Kumar, *Life Member* - Life Member (No. 10283967): American Geophysics Union (AGU).
26. Nath, Sankar Kumar, *Senior Member* - Member (No. 16472): The Seismological Society of America (SSA).
27. Nath, Sankar Kumar, *Senior Life Member* - Life Member (L/141): The Indian Society of Theoretical and Applied Mechanics
28. Das, Subhasish, *Life Member* - Indian Association of Sedimentologists, Aligarh
29. Das, Subhasish, *Member* - Wadia Institute of Himalayan Geology, Dehradun

30. Das, Subhasish, *Member* - Research Board of Advisors, American Biographical Institute, USA
31. Panigrahi, Mruganka Kumar, *Member* - Society for Geology Applied to Mineral Deposits
32. Panigrahi, Mruganka Kumar, *Member* - Society of Resource Geology
33. Panigrahi, Mruganka Kumar, *Member* - Association of Applied Geochemists
34. Sharma, Shashi Prakash, *Regular* - National Academy of Sciences, Allahabad, U.P.
35. Sharma, Shashi Prakash, *Regular* - Association of Exploration Geophysicist, Hyderabad, India

### ***Member - Editorial Board***

1. Basu, Arindam (2012) *Member: Fast Track Articles* - Journal of the Geological Society of India (Reference: Editorial Board formed in 2012)
2. Basu, Arindam (2011) *Member* - Journal of Engineering Geology (Reference: Editorial Board formed in 2011)
3. Bhowmik, Santanu Kumar (2011) *Editorial Advisory Board* - Indian Journal of Geosciences
4. Bhowmik, Santanu Kumar (2012) *Member, Editorial Board* - Journal of the Virtual Explorer
5. Gupta, Saibal (0) *Member, Editorial Board* - Indian Journal of Geology
6. Gupta, Saibal (0) *Member, Editorial Board* - Himalayan Geology
7. Mamtani, Manish A (2010) *Editorial Board Member (2008-2010)* - Journal of the Geological Society of India
8. Mamtani, Manish A (2012) *Member - Fast Track Articles (2012-present)* - Journal of the Geological Society of India
9. Mohanty, William Kumar (2010) *Member Editorial Board* - Prakruti Vikash
10. Mohanty, William Kumar (2012) *Member Editorial Board* - Journal of the Geological Society of India
11. Mukherjee, Abhijit (2011) *Guest Editor* - Applied Geochemistry
12. Mukherjee, Abhijit (2011) *Associate Editor* - Applied Geochemistry
13. Mukherjee, Abhijit (2013) *Associate Editor* - Frontiers in Environmental Sciences: Groundwater Resources and Management
14. Mukherjee, Abhijit (2013) *Associate Editor* - Journal of Hydrology
15. Mukherjee, Abhijit (2008) *Guest Editor* - Journal of Contaminant Hydrology
16. Nath, Sankar Kumar (2013) *Member* - International Journal of Earthquake Engineering and Hazard Mitigation (IREHM)
17. Nath, Sankar Kumar (2013) *Member* - ISET Journal of Earthquake Technology
18. Panigrahi, Mruganka Kumar (2010) *Member, Advisory Editorial Board* - Resource Geology
19. Sarkar, Anindya (2012) *Associate Editor* - Journal of Earth System Science, Springer
20. Singh, Arun (2012) *Editorial Board: GEOPHYSICS* - The Scientific World

### ***Awards & Honours***

1. Bera, Melinda Kumar (2013) *Associate of the Indian Academy of Sciences Bangalore (2013-2016)*
2. Basu, Arindam (2013) “*GSI Sesquicentennial Commemorative Award*□? *for the year 2013 in the field of Engineering Geology*

### ***Sponsored Research Projects***

1. Anatomy of the Himalayan orogeny using direct S waves (ISIRD, Rs.4.50 Lakhs)
2. Application of artificial intelligence in groundwater storage of Indian Subcontinent (MHRD, Rs.33.00 Lakhs)
3. Architectural-Archeological-Iconographic & Epigraphic exploration of Lalitagiri-Vajragiri-Pushpagiri, Odisha (MHRD, Rs.70.00 Lakhs)

4. Architectural-archeological-iconographic and epigraphic exploration of Chandraketugarh (MHRD, Rs.70.00 Lakhs)
5. Characterization of Seismicity in the Kumaun Himalaya for Hazard Assessment (MOES(Ministry of Earth Sciences Govt. of India), Rs.0.00 Lakhs)
6. Characterization of Seismicity in the Kumaun Himalaya for Hazard Assessment (MOES(Ministry of Earth Sciences Govt. of India), Rs.7.00 Lakhs)
7. Crust formation and terrane amalgamation in eastern India—constraints from enclaves in the Chhotanagpur Gneissic Complex (Indian Institute of Technology, Kharagpur, Rs.5.00 Lakhs)
8. Crustal seismic attenuation characteristics in Nepal Himalaya and southern Tibet from Lg Q inversion (ISIRD, Rs.4.00 Lakhs)
9. Deciphering the history of hydrothermal activity and controls on uranium mineralization at Koppunuru: constraints from mineral chemistry, stable isoto (BRNS, Rs.29.83 Lakhs)
10. Delineating physico-chemical dynamics of discharging groundwater to sea in coastal areas of the Bay of Bengal (Ministry of Earth Sciences, Rs.76.00 Lakhs)
11. Establishment of Electron Probe Micro Analyzer (EPMA) National Facility IIT, Kharagpur (DST, Rs.573.18 Lakhs)
12. Evaluating the potential of Malani Igneous Suite rocks, Rajasthan for Uranium mineralization using petrological and geochemical proxies (BRNS, Rs.35.00 Lakhs)
13. Geo-quest of Chandraketugarh (MHRD, Rs.105.00 Lakhs)
14. Geo-quest of Chandraketugarh (MHRD, Rs.105.00 Lakhs)
15. Geo-quest of Lalitagiri-Pushpagiri (Vajragiri) (MHRD, Rs.105.00 Lakhs)
16. Geo-quest of Lalitagiri-Pushpagiri (Vajragiri), Odisha (MHRD, Rs.105.00 Lakhs)
17. Geo-quest of Varanasi (MHRD, Rs.250.00 Lakhs)
18. Geo-quest of Varanasi (MHRD, Rs.250.00 Lakhs)
19. Geomicrobiology of the deep subsurface in Koyna-Warna region: Diversity, distribution and function of microbial communities within granitic-basaltic (Ministry of Earth Sciences, Rs.25.00 Lakhs)
20. Geophysical Syurvey using Gravity and Magnetic methods in South Purulia Shear Zone (BRNS, Department of Atomic Energy, Rs.19.63 Lakhs)
21. Groundwater-Sea water interaction at a coastal aquifer adjoining the Bay of Bengal: implications on flux and solute exchange (ISRD, SRIC IIT Kharagpur, Rs.5.00 Lakhs)
22. Historical Evidence, Myth and Geophysical Modeling to Assess the Tectonic Movement and Risks Associated with the Odisha Coastal 'Heritage' Belt (Ministry of Human Resource Development, Government of India, Rs.0.00 Lakhs)
23. Indian Geoid low: A feasibility study (MOES(Ministry of Earth Sciences Govt. of India), Rs.22.80 Lakhs)
24. Indo-US joint pilot project on Himalayan glaciers, aerosols and climate change sponsor Indo-US forum, US\$ 25000/- (2009-2011; on-going). (Indo-US forum, Rs.12.50 Lakhs)
25. Investigation of the basement structure of the Bengal Basin using Gravity and Seismic data (ISIRD IIT Kharagpur, Rs.3.00 Lakhs)
26. Isostatic coherence anisotropy using wavelet method (ISIRD, Rs.3.00 Lakhs)
27. Isotopes of water in India (2008-2013; on-going) (DST, Rs.12.00 Lakhs)
28. Microzonation and Evaluation of Vulnerability and Socio-Economic Impacts for the City of Kolkata including Greater Kolkata (MOES, Rs.432.71 Lakhs)
29. Mineral prospecting along SPSZ using field and satellite hyperspectral imaging (ISIRD (submitted), Rs.27.00 Lakhs)
30. National stable Isotope facility project at IIT, Kharagpur, sponsored by DST (outlay ~Rs. 200 lacs, 2004-2010; on-going). (DST, Rs.230.00 Lakhs)
31. Near Surface Geophysical and Geotechnical Investigation for Site-specific Seismic Hazard and Slope Stability studies in Gangtok (New Project revised) (Ministry of Earth Sciences, Govt. of India, Rs.66.00 Lakhs)
32. Predicting crack initiation stress by porosity and evaluating microstructural control on crack initiation: a study on granite (DST, New Delhi (Research Completed), Rs.0.00 Lakhs)
33. Quantitative assessment of weathering grades of rock materials (ISIRD, IIT Kharagpur (Completed), Rs.0.00 Lakhs)



34. Reservoir Characterization using Artificial Intelligent Techniques (Soft Computing) (Oil & Natural Gas Corporation Ltd. (ONGC), Dehradun, Rs.45.72 Lakhs)
35. Rock strength investigations of the metabasalts of Gadag region – implications for vein emplacement and mineralization (DST, New Delhi, Rs.21.00 Lakhs)
36. SANDHI, Science -Technology & Culture - Heritage Interface (MHRD, DEPARTMENT OF HIGHER EDUCATION, NEW DELHI, Rs.2150.00 Lakhs)
37. Seismic Hazard and Risk Assessment of Darjeeling-Sikkim Himalaya (Just completed)) (Ministry of Earth Sciences, Govt. of India, Rs.40.00 Lakhs)
38. Seismic Hazard Assessment, Microzonation, and Evaluation of Vulnerability & Risk of the Urban Kolkata (Ongoing) (Ministry of Earth Sciences, Govt. of India, Rs.432.71 Lakhs)
39. Seismic Vulnerability Assessment of Building types in India. (Ongoing) (NDMA, Ministry of Home Affairs, Govt. of India, Rs.25.20 Lakhs)
40. Seismicity monitoring, Maintenance of the Existing 16 Station Sikkim Strong Motion Array and Probabilistic Seismic Hazard Assessment of Darjeeling-Si (MOES, Rs.62.50 Lakhs)
41. Strong Motion Seismometry, Probabilistic Seismic Hazard, Vulnerability and Risk Microzonation of Darjeeling-Sikkim Himalaya (New Project to commence) (MoES, Rs.75.00 Lakhs)
42. Structural, mineralogical and geochemical appraisals of the Pur-Banera basin, Rajasthan for assessing its uranium potential (BRNS, Rs.34.10 Lakhs)
43. Testing models for mountain building in the northeastern Himalaya (Royal Society, Rs.0.00 Lakhs)
44. The exhumation factor in the genesis of inverted metamorphic sequences – an evaluation from structure, metamorphism, fluid inclusions and earthqu (DST, Rs.14.22 Lakhs)
45. The Indian Continental Shelf as a potential source of Phosphate (Ministry of Earth Sciences, Rs.93.00 Lakhs)
46. The relationship between anisotropy of magnetic susceptibility, strength anisotropy and microstructure in rocks devoid of mesoscopic foliations (DST, New Delhi (Completed), Rs.21.02 Lakhs)
47. The Thermal Evolution of Peninsula India: Past behaviors and Future Potential. (Australia – India Strategic Research Fund (AISRF) and Department of Science and Technology (DST), Rs.13.59 Lakhs)
48. Thermal History of the Inverted Metamorphic Sequence from the Northwestern Arunachal Pradesh: Constraints from Microstructure, Thermobarometry and P-T (CSIR, Rs.18.72 Lakhs)
49. Understanding the extent and natural/anthropogenic controls on groundwater recharge in water scarce areas of western districts of West Bengal (Govt. of West Bengal, PHED, Rs.28.32 Lakhs)
50. Urban-design, planning and urban engineering exploration of Varanasi (MHRD, Rs.150.00 Lakhs)
51. Vertebrate microfossils from the Tiki Formation of the Rewa Gondwana basin: an integrated study on Upper Triassic biodiversity (SERB, DST India, Rs.20.00 Lakhs)

### ***Consultancy Projects***

1. GEOPHYSICAL AND HYDROGEOLOGICAL STUDY AT PROPOSED PROJECT SITE AT DURMUT, BLOCK : RAGHUNATHPUR-I, PURULIA. (Reliance Industries, Rs.18.25 Lakhs)
2. Geophysical and Hydrogeological study at Proposed Site at Durmut Block: Raghunathpur-I, Purulia (Reliance Cement Ltd, Rs.18.25 Lakhs)
3. Ground Vibration study on Inganijharan Iron and Manganese Mines in District Keonjhar, Orissa (Bhanja Minerals Pvt. Ltd., Rs.2.48 Lakhs)
4. Groundwater investigation around Hijli railway station (Private firm, Rs.1.50 Lakhs)
5. Hydrogeological Studies at Bangur Chromite Mines of OMC Ltd. (PI), Orissa Mining Corporation Ltd. (Orissa Mining Corporation Ltd., Rs.11.53 Lakhs)

6. HYDROLOGICAL STUDIES AT BANGUR CHROMITE MINES (Govt of Orissa, Rs.11.30 Lakhs)
7. Integrated Beach Front Development, Digha-Shankarpur (IWIN Advisory Services Ltd, Rs.3.60 Lakhs)
8. Integrated geological and geophysical study around Tangarapada area, Orissa (The Industrial Development Corporation of Orissa Ltd. (IDCOL) Government of Orissa, Rs.10.68 Lakhs)
9. LA-ICPMS Analytical facility (Various users, Rs.3.00 Lakhs)
10. LA-ICPMS Analytical Facility (Various users, Rs.3.00 Lakhs)
11. Probabilistic Assessment of Tsunamigenic Earthquake Originating from Burmese-Andaman Arc System (BAAS) and West Sunda Arc (WSA) (Nuclear Power Corporation of India, Limited, Government of India, Rs.0.00 Lakhs)
12. Probabilistic seismic hazard analysis for Kakrapar Atomic Power Plant (KAPS-1,2) (Nuclear Power Corporation of India Limited, Government of India, Rs.10.75 Lakhs)
13. Seismic Hazard Analysis (SHA) and preparation of seismic hazard curves (SHC) for smelter and CPP area of Aditya Aluminium at Lapanga, Sambalpur, Oriss (Aditya Aluminium, Rs.4.30 Lakhs)
14. Site Specific seismic hazard study of west Sikkim region for the Rangit II Hydro- Electric project (M/S Gammon India Limited, Mumbai, India, Rs.4.16 Lakhs)

#### **Visits Abroad by Faculty Members**

1. Nath, Sankar Kumar - International Workshop for Regional Cooperation in Seismology and Earthquake Engineering in Asia (Kathmandu, Nepal, ) 15-20, Sept., 2013
2. Mamtani, Manish A - Oral Presentation:19th International Conference on Deformation Mechanisms, Rheology & Tectonics(DRT) (Leuven (Belgium), ) 16-18 September 2013
3. Bhowmik, Santanu Kumar - To attend Goldschmidt Conference, 2013 (Florence, Italy, ) 22-30 August, 2013
4. Mohanty, William Kumar - Collaborative Research (Lettis Consultants International Inc. California, USA, ) July 7 to July 14, 2013
5. Upadhyay, Dewashish - Collaborative research (University of Muenster, ) May-June 2013

#### **Invited Lectures by Faculty Members**

1. Evolution of the Indian Lithosphere and the Appearance and Diversification of Life *by* Bhowmik, Santanu Kumar (Department of Geology, Jadavpur University, Kolkata)
2. Metamorphic Phase Relations in a Partially Hydrated Metanorite as Monitors for Multiple Thermal Puls *by* Bhowmik, Santanu Kumar (University of Florence, Italy)
3. Multi-criteria Decision making for mineral prospecting: with special reference to SPSZ *by* Maiti, Sabyasachi (Brainstorming session for 36th IGC, Kolkata)
4. *by* Sen Gupta, Debashish (National Institute of Technology, Durgapur, West Bengal)
5. Developments in VLF electromagnetic *by* Sharma, Shashi Prakash (NGRI Hyderabad)
6. Early basin tectonic style, mechanism and conversion histories during the Archean and Proterozoic... *by* Das, Subhasish (Fergusson College, Pune)
7. Crustal deformation in stable Continental Regions *by* Nath, Sankar Kumar (2nd Indo-Norwegian Workshop on Geohazards organized by the Ministry of Earth Sciences, Govt. of India at Prithvi Bhawan, Lodhi Road, New Delhi)
8. Time Dependent and Time Independent Probabilistic Seismic Hazard of Northeast India with emphasis on *by* Nath, Sankar Kumar (2nd Indo-Norwegian Workshop on Geohazards organized by the Ministry of Earth Sciences, Govt. of India at Prithvi Bhawan, Lodhi Road, New Delhi.)
9. Seismic Microzonation: Principles, Potocol on Indian Scenario *by* Nath, Sankar Kumar (Institute of Seismological Research after the 3rd Annual Convention on “Advances in Earthquake Science” followed by the Workshop on “Seismic Microzonation” held at the Institute of Seismological Research in collaboration with GSDMA, GIDM and DST)

10. Recent Earthquakes in South & Central Asia with special emphasis to Seismic Scenario in India by Nath, Sankar Kumar (Recent Earthquake Session of the “International Workshop for Regional Cooperation in Seismology and Earthquake Engineering in South and Central Asia” held at Club Himalaya, Nagarkot, Kathmandu, Nepal, on invitation from UNESCO, USGS, NSET)
11. Seismic Microzonation towards Earthquake Disaster Mitigation by Nath, Sankar Kumar (National Platform for Disaster Risk Reduction (NPDRR) organized by the Ministry of Home Affairs, Govt. of India, at Vigyan Bhawan, New Delhi.)

### ***Papers Published in Journals***

1. 3-D Mohr circle construction using vein orientation data from Gadag (southern India) – implications to recognize fluid pressure fluctuation By Mondal, T.K., and Mamtani, M.A. *Journal of Structural Geology* 56, 45-56 (2013)
2. 3D compact inverse modeling of gravity data for chromite exploration A case study from Tangarparha, Odisha, India By Animesh Mandal, William K. Mohanty, S. P. Sharma *SEG Technical Program Expanded Abstracts* 32, 1171-1174 (2013)
3. A method for estimating crack-initiation stress of rock materials by porosity By Basu, A., Mishra, D. A. *Journal of the Geological Society of India* (Accepted) (2013)
4. A practical solution in delineating thin conducting structures and suppression problem in direct current resistivity sounding By S.P. Sharma and Arkoprovo Biswas *Jour. of Earth System Science* 112(4), 1065-1080 (2013)
5. Ancient terrane boundaries as probable seismic hazards: A case study from the northern boundary of the Eastern Ghats Belt, India, By Gupta, S., William K. Mohanty, A. Mandal, S. Misra. *Geoscience Frontiers* 5, 17-24 (2014)
6. Appraisal of a new 1D weighted joint inversion of ground based and helicopter-borne electromagnetic data By Sudha, B. Tezkan, B. Siemon *Geophysical Prospecting* (2014)
7. Brazilian and ring tests in assessing indirect tensile strength of sandstone By Basu, A., Behera, U., Mishra, D. A. *Journal of Engineering Geology* XXXVIII, 174-180 (2013)
8. Continental scale body wave tomography of India: Evidence for attrition and preservation of lithospheric roots By Singh A., Mercier, J. P., Kumar, M. R., Srinagesh, D., and Chadha, R. K. *accepted, Geochemistry, Geophysics, Geosystems* (2014)
9. Correlation of VLF-EM Data with Radiometric Measurements: Implications for Uranium Exploration around Beldih, South Purulia Shear Zone, India By SaurabhMittal, S. P. Sharma, Arkoprovo Biswas, and D. Sengupt *International Journal of Geophysics* 2014, ID 969462 (2014)
10. Correlation of VLF-EM data with radiometric measurements: Implications for uranium exploration around Beldih, South Purulia shear zone, By S. Mittal, S.P. Sharma, A. Biswas and D. Sengupta *International Journal of Geophysics* 2014, doi/10.1155/14 (2014)
11. Delineation of Extension of Uranium Mineralization Zone using Resistivity and Very Low Frequency Electromagnetic surveys around South Purulia Shear Zone, India By S.P. SHARMA, ARKOPROVO BISWAS and SAURABH MITTAL *Jour. of Geological Society of India* (In Press) (2014)
12. Delineation of subsurface structures using self-potential, gravity, and resistivity surveys from South Purulia Shear Zone, India: Implication to uranium mineralization By Arkoprovo Biswas, Animesh Mandal, S. P. Sharma, and W. K. Mohanty *Interpretation* (In Press) (2014)
13. Domainal petrofabric analysis of micaceous quartzite using EBSD data: role of muscovite in LPO evolution of quartz By Renjith, A.R., and Mamtani, M.A. *Journal of the Geological Society of India* in-press (2014)
14. Earthquake forecasting and its verification in northeast India By William K. Mohanty, Alok K. Mohapatra, Akhilesh K. Verma, Kristy F. Tiampo and Kaushik Kislay *Geomatics, Natural Hazards and Risk* <http://dx.doi.org/10> (2014)

15. Earthquake Scenario in West Bengal with emphasis on Seismic Hazard, Vulnerability & Risk Microzonation of Kolkata City, West Bengal, India By Nath, S. K., Adhikari, M. D., Maiti, S. K., Devaraj, N., Srivastava, N. and Mohapatra, L. D. *Natural Hazards and Earth System Sciences* Revised (2014)
16. Estimation of <sup>238</sup>U, <sup>232</sup>Th and <sup>40</sup>K concentrations in rock and soil samples around South Purulia Shear Zone, India By S. Mittal, R Guin, S.P. Sharma, D. Sengupta *Int. Jour. of Low radiation* 9(2), 110-118 (2013)
17. Estimation of U-238, Th-232 and K-40 concentration in rock and soil samples around South Purulia Shear Zone, India By S. Mittal, R. Guin, S.P. Sharma and D. Sengupta *International Journal of Low Level Radiation* 9, No. 2, 110-118 (2013)
18. Fabric analysis in massive rocks of the Gadag region (southern India) – implications to decipher time relationship between regional deformation and gold mineralization. By Mondal, T.K., and Mamtani, M.A. *Tectonophysics* in-press (2014)
19. Functional Relation for Earthquake Interarrival Times and Magnitude for Source Zones from Northeast India and Surrounding Region By Yadav, A. and Nath, S. K. *Seismological Research Letters* Revised (2014)
20. Geophysical anomalies associated with uranium mineralization from Beldih Mine, South Purulia Shear Zone, India By A. Mandal, A. Biswas, S. Mittal, W.K. Mohanty, S.P. Sharma and D. Sengupta *Journal of Geological Society of India* 82, 601-606 (2013)
21. Geophysical Anomalies Associated with Uranium Mineralization from Beldih Mine, South Purulia Shear Zone, India By ANIMESH MANDAL, ARKOPROVO BISWAS, SAURABH MITTAL, WILLIAM K. MOHANTY, SHASHI PRAKASH SHARMA, DEBASHISH SENGUPTA, JOYDIP SEN and A. K. BHATT *Jour. of Geological Society of India* 82, 601-606 (2013)
22. Geophysical anomalies associated with uranium mineralization from Beldih mine, South Purulia Shear Zone, India By 1. Mandal Animesh, Arkoprovo Biswas, Saurabh Mittal, William K. Mohanty, Shashi Prakash Sharma, Debashish Sengupta, Joydip Sen, and A. K. Bhatt *Journal of Geological Society of India* 82, 601-606 (2013)
23. Gravity-magnetic studies for uranium exploration over Manbazar-Kutni area of South Purulia Shear Zone (SPSZ), West Bengal, India using hydro-uranium anomalies as guidance By Animesh Monandal., William K. Mohanty, S.P. Sharma *GSTF Journal of Geological Sciences* 1 (1), 83-87. (2013)
24. Gravity-magnetic studies over Manbazar-Kutni area of South Purulia Shear Zone By Animesh Mandal, W.K. Mohanty, S.P. sharma *GSTF International Journal of Geosciences* 1(1), 83-87 (2013)
25. Integrating apparent conductance in resistivity sounding to constrain 2-D gravity modeling for subsurface structure associated with uranium mineralization across South Purulia Shear Zone, West Bengal, India By 3. Biswas, A., A. Mandal, S. P. Sharma, and W. K. Mohanty *International Journal of Geophysics* (2014)
26. Integrating Apparent Conductance in Resistivity Sounding to Constrain 2D Gravity Modeling for Subsurface Structure Associated with Uranium Mineralization across South Purulia Shear Zone, West Bengal, India By Arkoprovo Biswas, Animesh Mandal, Shashi Prakash Sharma, and William Kumar Mohanty *International Journal of Geophysics* 2014, ID 691521 (2014)
27. Interpretation of self-potential anomaly over a 2D inclined structure using very fast simulated-annealing global optimization — An insight about ambiguity By S.P. Sharma and Arkoprovo Biswas *Geophysics* 78(3), WN3-WB15 (2013)
28. Low shear velocities in the sub-lithospheric mantle beneath the Indian shield? By Kumar, M. R., Saikia, D., Singh, A., Srinagesh, D., Baidya, P. R., and Dattatrayam, R. S. *J. Geoph. Res.* 118, 1142-1155 (2013)
29. Magnetic fabric as a vorticity gauge in syntectonically deformed granitic rocks. By Mamtani, M.A. *Tectonophysics* in-press (2014)
30. Near surface shear velocities in diverse geological segments of India By Singh, A., Kumar, M. R., Srinagesh, D *Bull. Seism. Soc. Am.* 03, 317-327 (2013)

31. Next Generation Attenuation Models and Time Independent Probabilistic Seismic Hazard of Darjeeling–Sikkim Himalaya By Nath, S. K., and Adhikari, M. D. *International Journal of Earthquake Engineering and Hazard Mitigation (IREHM)* 1(1), 29-54 (2013)
32. Probabilistic Seismic Hazard Analysis for Kakrapar Atomic Power Station, Gujrat, India By William K. Mohanty and Akhilesh Kumar Verma *Natural Hazards* 69 (1), 919-292 (2013)
33. Probabilistic Seismic Hazard Model of West Bengal, By Maiti, S. K., Nath, S. K., Adhikari, M. D., and Sengupta, P. *Journal of Earthquake Engineering* Under review (2014)
34. Reply to the discussion of Deb (2013) on the paper of Saha et al. (2013) entitled ‘Tectono-magmatic evolution of the Mesoproterozoic Singhora basin, central India: Evidence for compressional tectonics from structural data, AMS study and geochemistry By Chakraborty, P.P., Das, K., Saha, S., Das, P., Karmakar, S., and Mamtani, M.A. *Precambrian Research* 236, 297-302 (2013)
35. Resolution of multiple sheet-type structures in self-potential measurement By Arkoprovo Biswas and Shashi Prakash Sharma *Jour. of Earth System Science* (In Press) (2014)
36. Rock failure modes under uniaxial compression, Brazilian and point load tests By Basu, A., Mishra, D. A., Roychowdhury, K. *Bulletin of Engineering Geology and the Environment* 72, 457-475 (2013)
37. Seismic Vulnerability & Risk Assessment of Kolkata City, India By Nath, S. K., Adhikari, M. D., Devaraj, N. and Maiti, S. K. *Natural Hazards and Earth System Sciences* Accepted (in press) (2014)
38. Shoreline changes in response to sea level rise along Digha Coast, Eastern India: an analytical approach of remote sensing, GIS and statistical techniques By Adarsa Jana, Arkoprovo Biswas, Sabyasachi Maiti, Amit K. Bhattacharya *Journal of Coastal Conservation doi: 10.1007/s11852-013-0297-5* Article in Press (2013)
39. Topographic gradient based site characterization in India complemented by strong ground motion spectral attributes By Nath, S. K., Thingbaijam, K.K.S., Adhikari, M. D., Devraj, N., Nayak, A., Ghosh, S. K., and Mahajan, A. K. *Soil Dynamics and Earthquake Engineering* 55, 233-246 (2013)
40. Two distinct shear wave splitting directions in the northwestern Deccan Volcanic Province By Rao, K. M., Kumar, M. R., Singh, A., Rastogi, B. K. *J. Geoph. Res.*, 118,10, 5487–5499 (2013)
41. Zoned Monazite and Zircon as Monitors for the Thermal History of Granulite Terranes: An Example from the Central Indian Tectonic Zone By Bhowmik, S.K., Wilde, S.A., Bhandari, A. & Basu Sarbadhikari, A. *Journal of Petrology* 55, 585-621 (2014)

### ***Papers Presented in Conferences***

1. 3D bathymetric mapping using Indian remote sensing data: a case study from Sundarban delta, West Bengal, By Manas K Das, S.Das and D.J.Sen, *International Seminar on Geosciences for Mineral Development and Environment*, Utkal University, Bhubaneswar, Orissa, (2014)
2. 3D compact inverse modeling of gravity data for chromite exploration A case study from Tangarparha, Odisha, India, By Mandal, A., W. K. Mohanty, and S. P. Sharma, *SEG International Exposition and EightyThird Annual Meeting, Houston, Texas,* Houston, Texas, USA, (2013)
3. AMS, vein orientation, and 3-D Mohr circle analyses from Gadag (southern India) – recognizing fluid pressure fluctuation and its significance in Gold mineralization., By Mamtani, M.A. and Mondal, T.K., *19th Deformation Mechanisms, Rheology and Tectonics (DRT)*, Leuven, Belgium, (2013)
4. Analysis of brittle and ductile structures in the rocks of Gadag region (Southern India),. By Mondal, T.K., and Mamtani, M.A., *National Workshop on Modern Geological and Geophysical Methods and their Applications*, Jadavpur University, Kolkata, (2013)
5. Application of AMS in Structural Geology – developments in the past decade., By Mamtani, M.A., *Annual General Meeting of the Geological Society of India and International*

- Conference on Future Challenges in Earth Sciences for Energy & Mineral Resources*, ISM Dhanbad, (2013)
6. Coalesced time-transgressive Kolhans from the Chaibasa-Noamundi basin : implications on accommodation space-process response sedimentation and graben tectonics, By S.Das and Smruti Rekha Sahoo, *International Seminar on Geosciences for Mineral Development and Environment. In collaboration with Association of Geoscientists for International Development*, Utkal University, Bhubaneswar, Orissa, (2014)
  7. Compact inverse modeling of gravity data- a potential approach for delineation of concealed chromite deposits- a case study from Tangarparha, Odisha, By Animesh Mandal, Kumarvardhanam Daga, W.K. Mohanty and S.P. Sharma, *Indian Geophysical Union*, Hyderabad, (2014)
  8. Constraining the Thermal History of an Ultra-Hot Orogen from Metamorphic Reaction History and Garnet-Orthopyroxene Diffusion Modelling Studies, By Bhowmik, S.K. & Chakraborti, S., *Goldschmidt Conference*, Florence, Italy, (2013)
  9. Cross-section of the reaction  $^{34}\text{Se}^{74}(\text{n},2\text{n})^{34}\text{Se}^{73\text{m}}$  through activation analysis by 14 Mev neutrons, By R. Mamdal, V.N. Bhoraskar and D. Sengupta, *National Workshop on Radiation*, Ranchi, Jharkhand, (2013)
  10. Determination of fluid pressure conditions from vein orientation data in metabasalt and metasedimentary rocks of Gadag region (southern India) – a study based on 3-D Mohr circle construction., By Mondal, T.K., and Mamtani, M.A., *National Seminar on Recent Advances in Earth Sciences*, Sambalpur University, (2014)
  11. Determination of kinematic vorticity number using Anisotropy of Magnetic Susceptibility (AMS) Data, By Mamtani, M.A., *2nd Rock Deformation & Structures (RDS-II) conference*, Lucknow University (Lucknow), (2012)
  12. Does AMS data from micaceous quartzite give information about the c-axis of quartz? First results from SEM-EBSD analysis., By Renjith, A.R., and Mamtani, M.A., *National Workshop on Modern Geological and Geophysical Methods and their Applications*, Jadavpur University, Kolkata, (2013)
  13. Estimation of Permeability from Well Log Data using Neuro-Fuzzy Techniques for Reservoir Characterization., By Verma, A.K., Chaki S., Routray, A. and Mohanty, W.K., *49th Annual Convention of IGU on Towards the energy security - Exploration, Exploitation and new strategies*, Gandhinagar, India, (2012)
  14. Fabric analysis in the Gadag schist belt using AMS: implications for vein emplacement., By Mondal, T.K., and Mamtani, M.A., *18th Convention of Indian Geological Congress & International Symposium on Minerals and Mining in India – the way forward, inclusive of cooperative mineral-based industries in SAARC countries*, Bhopal, (2013)
  15. Fabric analysis of the massive metabasalts in the Gadag region – preliminary results from anisotropy of magnetic susceptibility (AMS) studies, By Mondal, T.K. and Mamtani, M.A., *2nd Rock Deformation & Structures (RDS-II) conference*, Lucknow University (Lucknow), (2012)
  16. Finite difference modelling of Magnetotelluric TE mode responses over 2D structure, By Anand Singh and S.P. sharma, *Modern geological and geophysical methods and their applications*, Kolkata, (2013)
  17. Geological and geophysical variations across the Talchir Gondwana basin - evidence for episodic reactivation of the North Orissa Boundary Fault, India, By Animesh Mandal, Surajit Misra, William K Mohanty, Saibal Gupta., *American Geophysical Union (AGU) Fall Meeting 2012*, San Francisco, (2012)
  18. Identifying the principal testing directions using AMS data for rock mechanics investigations., By Vishnu, C.S., Mamtani, M.A. and Basu, A., *Annual General Meeting of the Geological Society of India and International Conference on Future Challenges in Earth Sciences for Energy & Mineral Resources*, ISM Dhanbad, (2013)
  19. Imaging subsurface conductors using VLF EM data- A frequency dependent approach, By S.P. Sharma and Anand Singh, *Indian Geophysical Union*, Hyderabad, (2014)

20. Importance of fabric and rock strength anisotropy studies in understanding mineralization, By Vishnu, C.S. and Mamtani, M.A., *National Seminar on Recent Advances in Earth Sciences*, Sambalpur University, (2014)
21. Integrated geophysical survey for the delineation of subsurface structure associated with uranium mineralization, South Purulia Shear Zone, India, By Arkoprovo Biswas, Animesh Mandal, and S.P. Sharma, *Indian Geophysical Union*, Hyderabad, (2014)
22. Integrated gravity-magnetic study for subsurface investigation and correlation with hydro-uranium anomalous zones of Manbazar-Kutni area of South Purulia Shear Zone, West Bengal, India, By Animesh Mandal, William K. Mohanty, and S.P. Sharma, *Annual International conference of Geological and Earth Sciences (GEOS 2012)*, Singapore, (2012)
23. Integrating EBSD and magnetic fabric data from quartzites – testing efficiency of AMS in petrofabric studies., By Renjith, A.R., and Mamtani, M.A., *Annual General Meeting of the Geological Society of India and International Conference on Future Challenges in Earth Sciences for Energy & Mineral Resources*, ISM Dhanbad, (2013)
24. Joint inversion of gravity and very low frequency electromagnetic anomaly, By Animesh Mandal, S.P. Sharma and W.K. Mohanty, *Indian Geophysical Union*, Hyderabad, (2014)
25. Next Generation Attenuation Models and Time Independent Probabilistic Seismic Hazard, Vulnerability & Risk Microzonation of Darjeeling-Sikkim Himalaya, By Nath, S. K., *International Workshop on Regional Cooperation in Seismology and Earthquake Engineering in South and Central Asia*, Kathmandu, Nepal., (2013)
26. Paleoproterozoic Kolhan sedimentation in Chaibasa-Noamundi basin: a late time-transgressive depositional cycle in a fan delta-lacustrine environment., By Smruti Rekha Sahoo and S.Das, *International Seminar on Sedimentary Processes and Metallogeny through time*, Dharwar,Karnataka, (2014)
27. Probabilistic Seismic Hazard Analysis for Nuclear Power Plant: A Case Study from Western India, By Mohanty, W.K. and Verma, A.K, *Annual International Conference on Geological and Earth Sciences(GEOS 2012)*, Singapore, (2012)
28. Proterozoic Kolhan Basin: a review, By S.Das and Banasree Koushik Thakur, *International Conference on Recent Developments in Stratigraphy*, Fergusson College,Pune, (2013)
29. Recognition of fluid pressure fluctuation from quartz vein orientations – a study based on 3-D Mohr circle construction, By Mondal, T.K. and Mamtani, M.A., *Tectonic Studies Group Annual Meeting 2013*, University of Leeds (UK), (2013)
30. Rock strength anisotropy, vein emplacement and gold mineralization in gadag (south India)., By Vishnu, C.S. and Mamtani, M.A., *National Workshop on Modern Geological and Geophysical Methods and their Applications*, Jadavpur University, Kolkata, (2013)
31. Sandstone Petrofacies, Paleotectonics and Paleogeography of Kolhans in the Chaibasa-Noamundi Basin, West Singbhum, Jharkhand, By S.Das and Smruti Rekha Sahoo, *International Conference on Recent Developments in Stratigraphy*, Fergusson College,Pune, (2013)
32. Sediment-fluid flow path and interaction:a 2d model from Nizampatnam bay, K-G basin, By S.Das, S.Majumdar, R.Singh and A.Kumar, *International Seminar on Geosciences for Mineral Development and Environment*, Utkal University,Bhubaneswar,Orissa, (2014)
33. Seismic Hazard Microzonation: An Indian Perspective., By Nath, S. K. and Adhikari, M. D., *3rd Annual Convention on “Advances in Earthquake Science” followed by Workshop on “Seismic Microzonation”*, Institute of Seismological Research, (2014)
34. Seismic Hazard, Vulnerability & Risk Assessment of Darjeeling-Sikkim Himalaya, By Nath, S. K., *Indo-Taiwan Workshop*, New Delhi, (2013)
35. Structural control on gold mineralization in Gadag (southern India) – a study based on AMS, vein orientation and 3-D Mohr circle analyses., By Mondal, T.K., and Mamtani, M.A., *Annual General Meeting of the Geological Society of India and International Conference on Future Challenges in Earth Sciences for Energy & Mineral Resources*, ISM Dhanbad, (2013)

36. The movement direction in the Kerajang Shear Zone – textural and AMS studies., By Misra, S., Gupta, S. and Mamtani, M.A., *2nd Rock Deformation & Structures (RDS-II) conference*, Lucknow University (Lucknow), (2012)
37. The Paleoproterozoic Supracrustal Kolhan Basin: Provenance, Tectonic and Palaeoweathering Histories, By Smruti Rekha Sahoo and S.Das, *National Conference on Sedimentation and Tectonics. Indian Association of Sedimentologists*, Manipur, (2013)
38. The role of muscovite in controlling LPO of quartz in a micaceous quartzite., By Renjith, A.R., and Mamtani, M.A., *National Seminar on Recent Advances in Earth Sciences*, Sambalpur University, (2014)
39. Time transgressive Kolhans in Fan delta-lacustrine Environment: Paleogeographic and Tectonic implications: a case study from Chaibasa Noamundi, Western Singhbhum, Jharkhand, By S.Das and Smruti Rekha Sahoo, *International Conference on Precambrian Continental Growth and Tectonism*, Jhansi, (2013)
40. Trace metal distribution around a thermal power plant in eastern India and its implications, By Kajori Parial and D. Sengupta, *Environmental Management on Coal based thermal power plants in Indian perspective*, College of Engg & Management, Kolaghat, (2013)
41. Triassic vertebrate biochronology: an Indian perspective, By S. Ray, *XXIV colloquium on Micropaleontology and Stratigraphy*, Dehradun, (2013)
42. Two Dimensional Subsurface Modeling Of Layered Sediments And Sediment Transport In The Krishna-Godavari Basin, By Subhasish Das, Sumana Mazumdar, Raj Singh, Ashutosh Kumar, *International Conference on Recent Developments in Stratigraphy (ICRDS-2013) in Association with Geological Society of India, Palaeontological Society of India, Gondwana Geological Society*, Fergusson College, Pune, (2013)
43. Variable grid Finite Element Computation of Acoustic Wave field using Implicit Finite Difference Time Integration, By Mishra, P. K. and Nath, S. K., *IGU Golden Jubilee Year Celebration, National Workshop on Modern Geological and Geophysical Methods and their Applications*, Jadavpur University, (2013)



## Department of Humanities & Social Sciences

### **Head**

Prof. Vijai Nath Giri

### **Professors**

Basu, Partha	<i>Ph.D.(Calcutta Univ)</i> , Quantitative Economics with special ref. to Efficiency and Growth
Chakraborti, Chhanda	<i>Ph.D.(Univ of Utah)</i> , Bioethics, Business ethics, Philosophy of Mind, Logic and Philosophy of logic
Chatterjee, Suhita Chopra	<i>Ph.D.(Bombay)</i> , Sociology of Health /Medical Sociology
Chatterjee, Bani	<i>Ph.D.(BHU, Varanasi)</i> , Development Planning, Manpower Management, International Finance
Giri, Vijai Nath	<i>Ph.D.(IIT Kharagpur)</i> , Conflict Resolution and Negotiation, Organizational Communication, Intercultural Communication, Interpersonal Communication
Nayak, Narayan Chandra	<i>Ph.D.(Utkal Univ)</i> , Development and Macro Economics
Patnaik, Priyadarshi	<i>Ph.D.(Utkal Univ)</i> , Indian aesthetics, Visual Culture and Communication, Cultural Translation theory and practice, Media and Multimedia Studies, Emotions and nonverbal communication
Roy, Anjali	<i>Ph.D.(Bombay)</i> , Postmodern and Post-colonial literature and Theory, Cultural Studies, Diaspora Studies, Partition and Punjab Studies
Srivastava, Kailash Bihari Lal	<i>Ph.D.(IIT Kanpur)</i> , Human Resource Management and Development, Organizational Behaviour, Knowledge management and innovation, Performance management, Sustainability Issues
Suar, Damodar	<i>Ph.D.(IIT Kharagpur)</i> , Social and organizational psychology, Neuropsychology
Tewari, Hare Ram	<i>Ph.D.(IIT Kharagpur)</i> ,

### **Associate Professors**

Behera, Bhagirath	<i>Ph.D.(Univ. of Bonn, Germany)</i> , Human Transformation and Well-Being, Environmental and Natural Resource Economics, Development Economics, New Institutional Economics, Economics of Religion, Green Economics
Chakraborty, Jayshree	<i>Ph.D.(IIT Kanpur)</i> , Semantics and Pragmatics, Discourse Analysis, Sociolinguistics, Indian English, Communication
Das, Saswat Samay	<i>Ph.D.(Utkal Univ.)</i> , Postmodern/postcolonial studies Critical theory Continental Philosophy, Culture Studies
Goswami, Kishor	<i>Ph.D.(IIT Kharagpur)</i> , Development Economics (Globalization - Gender and Trade - Poverty - Food Security), Agricultural Economics, Economics of Biofuels
Husain, Zakir	<i>Ph.D.(Univ. of Calcutta)</i> , Health Economics, Education, Ageing, Gender studies

Komalesha, H. S.	<i>Ph.D.(IIT Kharagpur)</i> , Translation Studies, Indian Literatures in English, Poetry, Postcolonial Literatures, Cultural Studies
Mahakud, Jitendra	<i>Ph.D.(IIT, Bombay)</i> , Financial Markets, Financial Economics, Corporate Finance, Fixed Income Securities, Equity Research, Financial Econometrics
Mishra, Pulak	<i>Ph.D (Vidyasagar University)</i> , Industrial Economics, Public Economics and Policy, Economics of Rural Development
Pradhan, Rabindra Kumar	<i>Ph.D.(Utkal Univ.)</i> , Positive Organisational Behaviour, Positive Psychology, Social Psychology, Industrial & Organisational Psychology, Human Resource Development and Management, Business Values & Ethics and Morals, Organizational Behaviour
Singh, Seema	<i>Ph.D.(BHU)</i> , English Language Teaching, Managerial Communication Styles, Communication Skills, Feminist Narratology, Indian Women Writing in English, Subaltern Writing

***Assistant Professors***

Aditya, Anwsha	<i>Ph.D.(Jadavpur Univ., Kolkata)</i> , Development Economics, International Trade
Chattopadhyay, Siddhartha	<i>Ph.D.(Univ. at Albany, SUNY)</i> , Econometrics, Macroeconomics, Dynamic Programming
Hiremath, Gourishankar S.	<i>Ph.D.(Univ. of Hyderabad)</i> , Financial Economics - Efficiency of Financial Markets, Macro and Monetary Economics, International Economics, Credit Cooperatives, Financial and Commodity Derivatives
Sahoo, Bimal Kishore	<i>Ph.D.(IIT Roorkee)</i> , Human Development, Labour Economics, Industrial Economics, Productivity and Efficiency Analysis, Food Security and Poverty, International Trade

***Faculty Appointments***

Dr. Anwsha Aditya	Assistant Professor
Dr. Siddhartha Chattopadhyay	Assistant Professor
Dr. Gourishankar S. Hiremath	Assistant Professor
Dr. Zakir Husain	Associate Professor
Dr. Bimal Kishore Sahoo	Assistant Professor
Mr. B. N. Sarangi	Adjunct Professor

***Faculty Re-employment***

Hare Ram Tewari	Professor
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### ***Brief Description of on-going activities***

Research and Development on:

1. Quantitative economics, 2. Financial economics, 3. Economics of growth, 4. Industrial economics, 5. Development economics, 6. Environmental and resource economics, 7. Developing world bioethics, 8. Gender and trade, 9. Financial institutions and markets, 10. Sociology of health and medicine, 11. Human resource development, 12. Brain and behavior, 13. Interpersonal, intercultural and organizational communication, 14. Visual aesthetics, 15. Business ethics, corporate social responsibility, 16. Economics of biofuels, 17. Bioethics and Public Health Ethics.

Training and development programmes on: 1. Aesthetics 2. Interpersonal communication 3. Recent trends in human resource development 4. Strategic management 5. Emotional intelligence 6. Logic and applications of logic 7. Research methodology and data analysis 8. Financial modelling and risk management 9. Leadership and teambuilding 10. Language, cognition and communication 11. Understanding culture and practising cross-cultural communication 12. Creative writing, 13. Critical thinking, reading and writing skills

Course development on 1. Economics 2. Human Resource Management 3. Philosophy 4. Psychology

### ***Thrust Areas***

1. Development studies
2. Human resource management and ethics
3. Cultural and communication studies

### ***Lectures by Visiting Experts***

1. Performance Appraisal and Compensation Management *by* Dr. Dewakar Goel (Director (HR), Airport Authority of India (AAI))
2. Indian Capitalists and Planned Economic Development *by* Prof. Raghavendra Chattopadhyay (Indian Institute of Management, Kolkata)
3. Guest lecture on HR *by* Mr. Sujitesh Das (Head HR, Microland Ltd., Bangalore)
4. Guest lecture on HR *by* Ms. Neha Gupta (Manager (HR), Nomura Services India Pvt. Ltd. Mumbai)
5. Guest lecture on HR *by* Mr. Arijit Pal Choudhury (Executive Director (HR), Namura Services India Pvt. Ltd., Mumbai)
6. Guest lecture on English *by* Prof. Subhendu Mund (IIT Bhubaneswar)
7. Guest lecture on HR *by* Mr. Manish Gour (Director (HR), Alstom Projects India Limited, Noida)
8. Guest lecture on Economics *by* Prof. Rajat Acharaya (Jadavpur University)
9. Guest lecture on Psychology *by* Prof. G. Misra (University of Delhi)

### ***Doctoral and MS Degrees Awarded***

1. Deepti Sahoo : Structure, Conduct and Performance Relationships in Indian Banking Sector(Ph. D.)
2. Babita Mahapatra : Impact of Displacement on Women(Ph. D.)
3. Sharmita Dhar : Trends and Determinants of Transition Rate of Education in India(Ph. D.)
4. Papri Nath : Dynamics of Positive Affect: Examining the Immediate and Long Term Functions(Ph. D.)
5. Papiya Chakraborty : Institutionalizing Participation for Sustainable Watershed Management(Ph. D.)

6. Gokul Acharjee : Management of Small Scale Biomass Gasification Plant at Village Level(Ph. D.)
7. Sharmistha De : Interrogating Borders and Re-placing the Displaced: Narratives of East Bengal Partition Refugees in Talbagicha(Ph. D.)
8. Soumya Ranjan Dash : Asset Pricing Models, Financial Market Anomalies and Investor Sentiment: Evidences from Indian Stock Market(Ph. D.)
9. Madhu Malti Srivastava : Socio-Economic Life and Health Practices of the Lodha People(Ph. D.)
10. Debabrata Samanta : People's Participation and Public Service Delivery in East Midnapore District of West Bengal(Ph. D.)
11. Vishnu Kant Rajesh : Impact of Human Resource Development Climate on Workers' Attitudes and Behaviours in Indian Automotive Industries(Ph. D.)
12. Amar Kumar Mohanty : Impact of Infrastructure of Human Development in Odisha: A District Level Study(Ph. D.)
13. Jadab Kumar Pal : Education, Morbidity and Child Labour in Handloom Industry of Murshidabad District, West Bengal(Ph. D.)

### ***Member - Professional Bodies***

1. Nayak, Narayan Chandra, *Life Member* - Regional Science Association, India
2. Nayak, Narayan Chandra, *Life Member* - Indian Economic Association
3. Nayak, Narayan Chandra, *Life Member* - The Indian Econometric Society
4. Nayak, Narayan Chandra, *Member* - Poverty and Economic Policy Research Network (PEP-Network)
5. Nayak, Narayan Chandra, *Life Member* - Indian Society of Labour Economics
6. Singh, Seema, *Member* - Association for Business Communication (ABC), NY, USA
7. Singh, Seema, *Member* - Multi - Ethnic Literatures of the World, MELOW – India
8. Singh, Seema, *Life Member* - Indian Association for English Studies (IAES)
9. Singh, Seema, *Member* - International Association for the Teachers of English as a Foreign Language (IATEFL), University of Kent, UK
10. Singh, Seema, *Life Member* - All India English Teachers' Conference ( AIETC)
11. Singh, Seema, *Member* - English Language Teachers Association of India (ELTAI), Chennai
12. Singh, Seema, *Life Member* - Vidyasagar University English Teachers' Consortium (VUETC), Midnapore
13. Singh, Seema, *Member* - Indian Society for Technical Education (ISTE), New Delhi
14. Singh, Seema, *Member* - University Grants Commission (UGC), New Delhi
15. Singh, Seema, *Member* - International Association of Business Communicators (IABC), San Fransisco, California, USA
16. Singh, Seema, *Member* - Indian Association for Commonwealth Literature and Language Studies (IACLALS), New Delhi
17. Singh, Seema, *Life Member* - Indo - American Center for International Studies (IACIS), Hyderabad, formerly the American Studies Research Center (ASRC)
18. Singh, Seema, *Member* - Multi - Ethnic Literatures of the US, MELUS – India
19. Singh, Seema, *Regular* - Association for Learning Technologies (ALT), Oxford, UK
20. Singh, Seema, *Life Member* - National Library, Kolkata
21. Goswami, Kishor, *Regular* - International Society on Multiple Criteria Decision Making (MCDM), USA
22. Goswami, Kishor, *Life Member* - Agricultural Economics Research Association, New Delhi, India
23. Goswami, Kishor, *Life Member* - Indian Red Cross Society, India
24. Goswami, Kishor, *Life Member* - Circle for Child and Youth Research Cooperation in India – CCYRCI, Lucknow, India
25. Komalesha, H. S., *Member* - American Literary Translators Association
26. Komalesha, H. S., *Member* - ASLE-India

27. Komalesha, H. S., *Life Member* - Centre for Contemporary Theory
28. Komalesha, H. S., *Life Member* - Indian Association of Commonwealth Literature and Language Studies
29. Mishra, Pulak, *Life Member* - Indian Political Economy Association
30. Chakraborty, Jayshree, *Life Member* - Dravidian Linguistics Association
31. Chakraborty, Jayshree, *Life Member* - Linguistic Society of India
32. Pradhan, Rabindra Kumar, *Life Membership* - Indian Academy of Applied Psychology
33. Pradhan, Rabindra Kumar, *Annual* - International Association of Cross-Cultural Psychology
34. Pradhan, Rabindra Kumar, *Annual* - International Association of Applied Psychology
35. Pradhan, Rabindra Kumar, *Life Membership* - INDIAN Society for Training and Development
36. Pradhan, Rabindra Kumar, *Life Memeber* - National HRD Network
37. Pradhan, Rabindra Kumar, *Annual* - National Academy of Psychology, India
38. Pradhan, Rabindra Kumar, *Life Member* - International Association of Holistic Psychology
39. Pradhan, Rabindra Kumar, *Life Membership* - Indian Science Congress Association
40. Pradhan, Rabindra Kumar, *National Council Memeber* - Indian Society for Trainging and Development
41. Hiremath, Gourishankar S., - Indian Political Economy Association
42. Hiremath, Gourishankar S., - The Indian Economic Association
43. Hiremath, Gourishankar S., - The Indian Econometric Society
44. Husain, Zakir, *Member* - Asian Population Association
45. Husain, Zakir, *Life* - Indian Ecological Society
46. Husain, Zakir, *Member* - European Population Association
47. Husain, Zakir, *Member* - International Union for the Scientific Study of Population
48. Husain, Zakir, *Life Member* - The Indian Econometric Society
49. Giri, Vijai Nath, *Member* - National Academy of Pyschology (NAOP) India
50. Giri, Vijai Nath, *Member* - International Communication Association, USA
51. Roy, Anjali, *Senior Member* - Indian Association for Commonwealth Literature and Language
52. Roy, Anjali, *President* - Association for the Study of Australasia in Asia
53. Suar, Damodar, *Member* - Association for Psychological Sciences
54. Suar, Damodar, *Life Member* - National Academy of Psychology
55. Suar, Damodar, *Life Member* - Indian Society of Training and Development
56. Suar, Damodar, *Life Member* - The Indian Science Congress Association
57. Suar, Damodar, *Member* - Asian Association of Social Psychology
58. Srivastava, Kailash Bihari Lal, *Regular* - National Academy of Psychology
59. Srivastava, Kailash Bihari Lal, *Member of the Executive Committee* - Academy of International Business, India Chapter
60. Srivastava, Kailash Bihari Lal, *Member* - Indian Academy of Management
61. Patnaik, Priyadarshi, *Regular* - Word and Music Association
62. Chakraborti, Chhanda, *Regular member 2009-till date* - International Network of Women Philosophers, UNESCO
63. Chakraborti, Chhanda, *Nominated Program Advisor 2010-2011* - International Program Committee, 14th Congress of Logic, Methodology and Philosophy of Science (LMPS)
64. Chakraborti, Chhanda, *Member* - Forum of Medical Ethics Society
65. Chakraborti, Chhanda, *Member* - American Philosophical Association (APA)
66. Chakraborti, Chhanda, *Member 2010-till date* - International Association of Bioethics
67. Chakraborti, Chhanda, *Senior member 2000-till date* - Indian Philosophical Congress
68. Basu, Partha, *Life Member* - Indian Academy of Social Sciences
69. Chatterjee, Bani, *Life Member* - International Society of Adault Education
70. Chatterjee, Bani, *Life Member* - Indian Academy of Social Sciences
71. Chatterjee, Bani, *Life Member* - Regional Science Association

### ***Member - Editorial Board***

1. Chakraborti, Chhanda (2009) *Member 2009-till date* - Indian Journal of Medical Ethics
2. Goswami, Kishor (2013) *Advisory Board Member* - The International Journal of Economics and Business Modeling
3. Goswami, Kishor (2009) *Reviewer* - Journal of Rural and Community Development, Canada
4. Goswami, Kishor (2011) *Associate Editor* - Journal of Business Excellence
5. Goswami, Kishor (2009) *Reviewer* - International Journal of Ecology and Development
6. Goswami, Kishor (2011) *Editorial Board Member* - Aisa-Pacific Economic Association Newsletter
7. Goswami, Kishor (2011) *Associate Editor* - SAGE Open (Social Science Journals)
8. Komalesha, H. S. (2012) *Guest Editor* - Muse India
9. Pradhan, Rabindra Kumar (2013) *Reviewer* - Journal of Business Management and Administration, Malaysia
10. Pradhan, Rabindra Kumar (2013) *Reviewer* - Journal of Rural and Industrial Development
11. Pradhan, Rabindra Kumar (0) *Reviewer* - Indore Management Journal
12. Pradhan, Rabindra Kumar (2012) *Co-Chair, Technical Committee* - 42 National Convention of ISTD
13. Pradhan, Rabindra Kumar (2014) *Reviewer* - 28th International Congress of Applied Psychology, Paris, France
14. Pradhan, Rabindra Kumar (0) *Reviewer* - International Journal of Entrepreneurial Behaviour & Research (IJEER)
15. Pradhan, Rabindra Kumar (2013) *Reviewer* - 3rd Indian Academy of Management Conference, 12-14 December 2013
16. Roy, Anjali (2013) *Editorial Committee Member* - Media Watch
17. Roy, Anjali (2013) *Editorial Committee Member* - E-Journal of Global Diaspora Studies (JGDS)
18. Singh, Seema (2014) *Board of Editors* - Titiksha
19. Singh, Seema (2014) *Member, Board of Reviewers, Management Communication Quarterly, SAGE pub.* - Management Communication Quarterly
20. Srivastava, Kailash Bihari Lal (0) *Reviewer* - ICFAI Journal of Mergers and Acquisitions
21. Srivastava, Kailash Bihari Lal (2014) *Member Editorial advisory committee* - DRIEMS Business review
22. Srivastava, Kailash Bihari Lal (0) *Member Editorial board* - Journal of Technology & Management
23. Srivastava, Kailash Bihari Lal (2010) *Member, Editorial Advisory Board* - Journal of Contemporary research in Management
24. Srivastava, Kailash Bihari Lal (2014) *Member Editorial Advosiry Board* - Indian Journal of Development Stuides
25. Srivastava, Kailash Bihari Lal (0) *Reviewer* - ICFAI Journal of Knowledge Management
26. Srivastava, Kailash Bihari Lal (0) *Reviewer* - Psychological Sudies
27. Suar, Damodar (2002) *Associate Editor* - Psychological Studies

### ***Awards & Honours***

1. Aditya, Anwasha (2014) *International Economic Development Research Award by the Export-Import (EXIM) Bank of India for the best PhD dissertation in International Economics*
2. Pradhan, Rabindra Kumar (2013) *ISTD Best Teacher Award -2013 for Outstanding contribution in HR Training and Development*
3. Hiremath, Gourishankar S. (2013) *Prof. M J Manohar Rao Young Economist Award - The Indian Econometric Society*

### *Sponsored Research Projects*

1. A Creative Economic & Urban Design based Pilot Project of Kumartuli Area, Kolkata ( in Association with Kolkata Museum of Modern Arts) under SANDHI (MHRD, New Delhi, Rs.110.00 Lakhs)
2. A Creative Economic and Urban Design Based Pilot Project of Gariahat Area, Kolkata (Department of Higher Education, Ministry of Human Resource Development, Government of India, Rs.100.00 Lakhs)
3. A Creative Economic Regeneration and Urban Design Revival Project: Boipara-College Street, Kolkata (in association with KMoMA, Kolkata) (RAK) (MHRD, Department of Higher Education, New Delhi, Rs.10500000.00 Lakhs)
4. Architectural - Archaeological - Iconographic & Epigraphic exploration of : Lalitagiri - Vajragiri - Puspagiri, Odhisha (AEE) (MHRD, Rs.70.00 Lakhs)
5. Assessing the Current and Future Creative Economic Regeneration Scope of Traditional River -Based Heritage and Eco-Tourism Networks in KMA (Department of Higher Education, Ministry of Human Resource Development, Government of India, Rs.50.00 Lakhs)
6. COMMUNITY DEVELOPMENT THROUGH CORPORATE SOCIAL RESPONSIBILITY (CSR): A BENCHMARK STUDY FOR INDUSTRIAL UNITS IN PASCHIM MEDINIPUR (ACC Limited, Rs.4.56 Lakhs)
7. Coping with Changing Climate: The Role of Sustainable Use and Management of Traditional Water Harvesting Systems in Odisha and West Bengal (Indian Council of Social Science Reserach (ICSSR), New Delhi, Rs.1000000.00 Lakhs)
8. Decoding and Exploring Ancient Classification of Indian Classical Music through Machine Learning Methods and Audience Response (MHRD, Rs.150.00 Lakhs)
9. Economic Impact Assessment of National Food Security Act under the project Sustainable Food Security through Technological Intervention for Production (MHRD, New Delhi, Rs.30.00 Lakhs)
10. Economic Value Addition of Jatropha Based Products in Northeast India (National Oilseeds and Vegetable Oils Development (NOVOD) Board, Ministry of Agriculture, Govt. of In, Rs.17.54 Lakhs)
11. Ethnographic Profiling of Anglo-Indians in Small Town of India (New Zealand India Research Institute and Education New Zealand, Rs.18.00 Lakhs)
12. Evaluation of Long Term Impact of Completed Watershed Projects supported by NABARD in West Bengal (National Bank for Agriculture and Rural Development, Rs.4.00 Lakhs)
13. Expansion of Trade and Development of Women Entrepreneurs in Handloom Industry in Assam (Indian Council of Social Science Research, Rs.5.52 Lakhs)
14. Functional Explanations in Language : an Inquiry in the Context of Indian Languages (IIT, Kharagpur (ISIRD), Rs.1.60 Lakhs)
15. Ganga River Basin Management Plan: Socio-Economic and Cultural Aspects (Ministry of Forests and Environment, Government of India, New Delhi, Rs.19.45 Lakhs)
16. Historical Evidence, Myth and Geophysical Modeling to Assess the Tectonic Movement and Risks Associated with Odisha Coastal "Heritage" Belt under SAND (MHRD, New Delhi, Rs.0.00 Lakhs)
17. Impact of Workplace Spirituality on Job Outcomes (ICSSR, Ministry of HRD, Govt of India, New Delhi, Rs.5.00 Lakhs)
18. Impact Assessment of Mahatma Gandhi NREGS in Orissa: A Study of Mayurbhanj and Ganjam District (Indian Council of Social Science Research, New Delhi, Rs.5.65 Lakhs)
19. Impact of Emotional Labour on Psychological Health and Job Outcomes: A Study on Indian Service Industry (ICSSR, Ministry of HRD, Govt of India, New Delhi, Rs.5.00 Lakhs)
20. Improving End of Life Care for the Elderly by Integrating Indic perspectives on Ageing and Dying ( MHRD, Rs.75.00 Lakhs)
21. Making of Web-Portals and allied outreach activity for Varanasi project and allied projects under SANDHI (PVS) (MHRD, Rs.0.00 Lakhs)

22. Measuring Attitude towards Financial Risk among Handloom Micro-entrepreneurs in North East India (Indian Council of Social Science Research, India, Rs.15.00 Lakhs)
23. Reconfiguring DANA (generosity) as a New Institutional Financial Mechanism for Social Enterprises (DGE) (MHRD, Department of Higher Education, New Delhi, Rs.75.00 Lakhs)
24. Remembering the Komagata Maru: Historicizing Indian Migration to Canada (Shastri Indo-Canadian Institute Calgary, Rs.3.00 Lakhs)
25. Renovation, Extension and Modernization of Nehru Museum of Science and Technology (Ministry of Culture, Rs.27443768.00 Lakhs)
26. Setting up Community Radio at IIT Kharagpur (SRIC, Rs.3.00 Lakhs)
27. SOCIAL COST BENEFIT ANALYSIS OF THE PROPOSED COAL MINE AT CHHENDIPADA TEHSIL OF ANGUL DISTRICT, ODISHA (-Radhikapur(West) Coal Mining Private Ltd, Rs.4.49 Lakhs)
28. Social impact Analysis (ACC Limited, Rs.3.50 Lakhs)
29. Social Impact Assessment of National Food Security Act under the project Sustainable Food Security through Technological Intervention for Production, (MHRD, New Delhi, Rs.30.00 Lakhs)
30. Sustainability of Biodiesel Industry in North East India (South Asian Network for Development and Environmental Economics, Rs.9.15 Lakhs)
31. Sustainable food security through technological intervention for production, processing, and logistics (MHRD, Department of Higher Education, New Delhi, Rs.2600.00 Lakhs)
32. The Effect of Meditation, Pranayam and Meditative Sounds on the Cognitive and Emotional Performance of Human Brain: a study using an integrated signal (MHRD, Rs.150.00 Lakhs)
33. To develop a scientific rationale of IELTS applying (a ) Computational Linguistics & (b) Cognitive Geo-spatial mapping approaches (AIP) (MHRD, Department of Higher Education, New Delhi, Rs.10000000.00 Lakhs)
34. Urban-design, Planning & Urban Engineering Exploration of Varanasi (UDE) (MHRD, Department of Higher Education, New Delhi, Rs.15000000.00 Lakhs)

### ***Consultancy Projects***

1. Community Development through Corporate Social Responsibility (CSR): A Benchmark Study for Industrial Units in Paschim Medinipur (ACC Ltd, Rs.4.56 Lakhs)
2. Payments for environmental services: A review of experiences across countries (Jamsetji Tata Trust through RULNR, Hyderabad, Rs.1.40 Lakhs)
3. Preparation of Fire Safety Manual for NDMA, New Delhi (National Disaster Management Authority, New Delhi, Rs.-0.00 Lakhs)
4. Socio-Economic and Ecological Impact Evaluation Study of Forestry Projects Supported under RIDF in West Bengal (National Bank for Agriculture and Rural Development (NABARD), Rs.18.00 Lakhs)

### **Visits Abroad by Faculty Members**

1. Roy, Anjali - Conference (Sweden, ) 18-19 June 2013
2. Roy, Anjali - Conference (Singapore, ) 7-8 May 2013
3. Chakraborti, Chhanda - Presenting an invited paper (School of Philosophy, National and Kapodistrian University of Athens, Athens, Greece, ) August 3-10, 2013
4. Goswami, Kishor - For presenting a paper in 6th South Asia Economic Summit (Colombo, Sri Lanka, ) September 2-4, 2013
5. Goswami, Kishor - For participating in a Cost Benefit Analyses Course sponsored by SANDEE (Kathmandu, Nepal, ) December 6-8, 2013
6. Goswami, Kishor - For participating in a Policy Analyses and Environmental Economics Workshop sponsored by SANDEE (Bangkok, Thailand, ) May 19-22, 2013
7. Chakraborti, Chhanda - To deliver a series of invited lectures (Asian Institute of Technology and Management Kathmandu Nepal, ) March 17 to March 21 2014



8. Srivastava, Kailash Bihari Lal - To deliver a lecture in a programme (United Nations University Tokyo, Japan, ) 19-20 October 2013
9. Srivastava, Kailash Bihari Lal - To attend a UN sponsored workshop on leadership in sustainability (Beijing China, ) 15-18 June 2013

### **Invited Lectures by Faculty Members**

1. Inflation Target at the Zero Lower Bound *by* Chattopadhyay, Siddhartha (Vidyasagar University)
2. Leadership in Sustainability *by* Srivastava, Kailash Bihari Lal ( Institute of Sustainable Development and Peace, United Nations University Tokyo)
3. FDI in Retail: Issues, Challenges and Implications *by* Mishra, Pulak (Vyasagar (Auto.) College, Jajpur Road, Odisha)
4. Economic Reforms and Indian Firms *by* Mishra, Pulak (B. P. College of Business Administration, Gandhinagar)
5. Emotional Intelligence *by* Pradhan, Rabindra Kumar (VGSOM, IIT Kharagpur)
6. Time Management *by* Pradhan, Rabindra Kumar (VGSOM, IIT Kharagpur)
7. Leadership for Disaster Management *by* Pradhan, Rabindra Kumar (Tehri Garhwar Block, Uttarakhand in Association with LABSNAA)
8. Emotional Competence and Stress Management *by* Pradhan, Rabindra Kumar (NIIS Institute of Business Administration, Bhubaneswar)
9. Teamwork and Leadership Development *by* Pradhan, Rabindra Kumar (UIT, Burdwan University, West Bengal)
10. Options: Pricing and Trading Strategies *by* Hiremath, Gourishankar S. (Malaviya National Institute of Technology, Jaipur)
11. Understanding Corporate Social Responsibility and Sustainability *by* Chakraborti, Chhanda (Asian Institute of Technology and Management Kathmandu Nepal)
12. CSR and Business Ethics *by* Chakraborti, Chhanda (Asian Institute of Technology and Management Kathmandu Nepal)
13. Emotional and Moral Intelligence for Leadership Effectiveness *by* Pradhan, Rabindra Kumar (Science City, Kolkata, India during Easter Regional Conference of ISTD.)
14. Punjabiyaat and Siraiiki Movement *by* Roy, Anjali (Dept of Sociology University of Delhi)
15. Hybridization of Punjabi Music with African-Caribbean Music in the Diaspora Space *by* Roy, Anjali (Indira Gandhi National Centre for the Arts Delhi)
16. Research in Economics *by* Nayak, Narayan Chandra (KIIT University, Bhubaneswar)
17. Developing Interpersonal Communication Strategies *by* Giri, Vijai Nath (NIT Durgapur)
18. Interpersonal Communication Skills *by* Giri, Vijai Nath (NIT Uttarakhand)
19. Promoting good governance-- Positive contribution of vigilance *by* Suar, Damodar (Bharatiya Reserve Bank Note Mudran (P) Limited, Salboni, PM, WB)

### **Books Published**

1. : English for Jobseekers: Language and Soft Skills for the Aspiring *published by* Lina Mukhopadhyay, Muthukumar Maganti, Geetha Rajeevan, Priyadarshi Patnaik (2013)
2. Dr Rabindra Kumar Pradhan & Mr C K Podder: Human Resources Management in India: Emerging Issues and Challenges *published by* New Century Publications, New Delhi (2013)
3. Gourishankar S. Hiremath: Indian Stock Market: An Empirical Analysis of Informational Efficiency *published by* Springer (2014)
4. H S Komalesha: Rashtrakavi Kuvempu *published by* Sahitya Akademi, New Delhi (2013)
5. Maninder Kapoor and Seema Singh: Quest for Selfhood in Select Contemporary Indian English Womens Fiction *published by* SAGE Publications India Pvt Ltd (2013)
6. Sanghita Sen, Alankrita Mahindra and Priyadarshi Patnaik: Communication Skills in English *published by* Cambridge University Press, India (2013)

7. Sanghita Sen, Alankrita Mahendra and Priyadarshi Patnaik: Communication and Language Skills (in Press) *published by* Cambridge University Press, India (2014)
8. Saswat Samay Das: The Taking Place of Language: Contemporizing the Debate about the Representation of Nation within Bhasa writing and Indian writing in English *published by* Peter Lang Oxford, International Academic Publishers UK (2013)
9. Saswat.S.Das, Anindya Sekhar Purakayashtha: Para-logical discourse of Postmodernity: from Resistance to Expansion *published by* Palgrave Macmillan, (Forthcoming) (2014)
10. Seema Singh: English for Thesis Writing: A Student's Handbook *published by* Scitech, Kolkata (2014)
11. Seema Singh: Success in Oral Communication: Strategies for GD - PI and Presentations *published by* ISTE – Macmillan, New Delhi (2014)
12. Zakir Husain & Mousumi Dutta: Women workers in Kolkata's IT sector: Satisficing work and household *published by* Springer (2014)

#### ***Short-Term Courses, Training Programmes and Workshops organised***

1. Emotional Intelligence and Organizational Excellence (5-7 June 2013)
2. Training for Trainers (18-20 September 2013)

#### ***Papers Published in Journals***

1. Mapping the (Post)colonial Institutional Ontology: Sahitya Akademi and its Ambivalent Epistemic Leanings *By* Saswat Samay Das *Sambalpur Studies in Literatures & Cultures, Sambalpur University Press* Series III (2013)
2. A dependency annotation scheme for Bangla treebank *By* Sanjay Chatterji, Tanaya Sarkar, Pragati Dhang, Samhita Deb, Sudeshna Sarkar, Jayshree Chakraborty, Anupam Basu *Language Resources and Evaluation* 1574-020X, pp. 1-35 (2014)
3. Antecedents and moderators of software professionals' performance *By* Prasad H. C. S., Suar, D., & Taraban, R. *SAGE Open* 4, 1-17 (2014)
4. Agricultural Growth in Odisha during 1970-2012: An Analysis *By* Falguni Pattanaik, Narayan Chandra Nayak *IUP Journal of Applied Economics* 13(1), pp. 62-79 (2013)
5. Antecedents and Consequences of Emotions at workplace: A review and research Agenda *By* Avas Sahu and Kailash B L Srivastava *Indian Journal of Positive Psychology* 4(4),563-567 (2013)
6. Are women SHG members economically more empowered in left-run municipalities? *By* Zakir Husain, Diganta Mukherjee & Mousumi Dutta *Development in Practice* 23(1): 107-122 (2013)
7. Assessing Forest Cover Change and Relative Forest Sustainability Index for the Districts of Orissa *By* Amrita Basu, Narayan Chandra Nayak *Indian Journal of Regional Science* 45, pp. 144-156 (2013)
8. Beyond Corporate Social Responsibility: Ethics in Action *By* Anupam Ghosh and Chhanda Chakraborti *Global Virtue Ethics Review* Vol.7.No.1: 5-35. (2013)
9. Biodiversity Conservation and Local Livelihoods: A Study on Similipal Biosphere Reserve in India *By* Madhusmita Dash and Bhagirath Behera *Journal of Rural Development* 32(4): 409-426 (2013)
10. Conditional Multifactor Asset Pricing Model and Market Anomalies *By* S. R. Dash and Jitendra Mahakud *Journal of Indian Business Research* Volume 5 pp 271-294 (2013)
11. De-familiarizing Nationalist Discourses: Performative Ironies of the Normative Indian Episteme *By* Saswat Samay Das *Asiatic: IIUM Journal of English Language and Literature, University of Malaysia* Vol. 8, Number 2 (2013)
12. Determinants and consequences of organizational citizenship behaviour: A Conceptual Framework for Indian Manufacturing Organisations. *By* Dash, S. & Pradhan, R. K. *International Journal of Business and Management Invention*, 3(1), 17-27. (2014)

13. Determinants of Household Energy Use in Bhutan *By* Dil B. Rahut, Sukanya Das, Bhagirath Behera *Energy* Forthcoming (2014)
14. Determinants of inter-industry variations in research and development efforts in Indian manufacturing sector: a dynamic panel data analysis *By* Rakesh Basant, Pulak Mishra *Innovation and Development* 4(1) pp. 91-109 (2014)
15. Determinants of Inter-State Variations in FDI Inflows in India *By* Suhita Chatterjee, Pulak Mishra, Bani Chatterjee *Eurasian Journal of Business and Economics* 6(11), pp. 93-120 (2013)
16. Determinants of software exports from India *By* Sahoo, B. K., & Nauriyal, D.K *International Economics and Economic Policy* DOI 10.1007/s10368-0 (2014)
17. Dimensionality of organizational citizenship behaviour in Indian engineering institutions. *By* Kumar, S. P. & Giri, V. N. *International journal of education and management studies* 2, 286-290 (2013)
18. Distribution and Exhibition of Hindi Films in Singapore. *By* Roy, Anjali Gera *Inter-Asia Cultural Studies(Print)* Vol.14, No 4.635-643 (2013)
19. Does Feeling Happy Contributes to Flexible Thinking: Exploring the Association Between Positive Emotions and Cognitive Flexibility *By* Nath, P. & Pradhan, R. K. *Psychological Studies*, DOI: 10.1007/s12646-014-0241-2 Online First (2014)
20. Does health insurance ensure equitable health outcomes? An analysis of hospital services usage in urban India *By* Mousumi Dutta and Zakir Husain *World Health and Population* 14(4): 38-50 (2013)
21. Economic Freedom and Employment in India *By* Falguni Pattanaik, Narayan Chandra Nayak *South Asian Journal of Macroeconomics and Public Finance* 2(1), pp. 59-79 (2013)
22. Employment Intensity of Secondary Sector in India: Trends, Patterns and Determinants *By* Falguni Pattanaik, Narayan Chandra Nayak *Journal of Regional Development and Planning* 2, pp. 157-173 (2013)
23. Estimating India's Skill Gap on a Realistic Basis for 2022 *By* Santosh Mehrotra, Ankita Gandhi, Bimal K Sahoo *Economic & Political Weekly* vol xlviii 102 no 13 (2013)
24. Examining the relationship of personality and work values across career stages *By* Sinha Nupur & Kailash B L Srivastava, *Psychological Studies* 59(1) 44-51 (2014)
25. Export Diversification, Composition and Economic Growth: Evidence from Cross-Country Analysis *By* Anwesha Aditya, Rajat Acharyya *The Journal of International Trade and Economic Development* 22 (7), pp. 959-992 (2013)
26. Factors Affecting Household Perception of Wetland Conservation in West Bengal *By* Sourya Das, Bhagirath Behera, Ashok Mishra *International Journal of Ecological Economics and Statistics* 34(3):72-82 (2014)
27. Factors Influencing Entry of ITES Firms into High Value Services *By* Soni Agrawal, Kishor Goswami, and Bani Chatterjee *Journal of Management Research* Vol. 14, No. 1 (2014)
28. Factors Influencing Performance of Offshore Outsourcing Service Provider Firms across Three Locations in India *By* Soni Agrawal, Kishor Goswami, and Bani Chatterjee *International Journal of Business Insights and Transformation* Vol. 6(2), pp. 4-13 (2013)
29. Haroun and Luka: A study of Salman Rushdie's talismanic stories *By* Madhumita Roy and Anjali Gera Roy *The Journal of Commonwealth Literature* Online (2014)
30. Hulimavina Mara: P Lankesh and Autobiography *By* H S Komalesha *Muse India* Issue 49, May-June (2013)
31. Impact of Business Cycle on Bank Capital Buffers: Evidence from India *By* Jitendra Mahakud and S.R. Dash *Economics, Management and Financial Markets* Volume 8 pp 110-127 (2013)
32. Impact of Investor Sentiment on Stock Return: Evidence from India *By* S.R. Dash and Jitendra Mahakud *Journal of Management Research* Volume 13 pp 131-144 (2013)
33. Impact of teachers' participation in decision making on commitment forms in Indian engineering institutions. *By* Kumar, S. P. & Giri, V. N. *Pacific Business Review International* 5,49-58 (2013)

34. Influence of mood states, group discussion, and interpersonal comparison on change in decision-making and information processing *By* Mohanty, S. N., & Suar, D. *International Journal of Decision Sciences, Risk and Management* 5(2), 101-123 (2013)
35. Information literacy of U.S. and Indian engineering undergraduates *By* Taraban, R., Suar, D., & Oliver, K. *Springer Plus* 2(224), 1-12 (2013)
36. Investor Sentiment and Stock Return: Do Industries Matter? *By* S.R. Dash and Jitendra Mahakud *Margin: The Journal of Applied Economic Research* Volume 7 pp 315-349 (2013)
37. Is health wealth? Results of panel data analysis *By* Zakir Husain, Mousumi Dutta & Nidhi Chowdhury *Social Indicators Research* (2013)
38. Liquidity Trap and the Conditional Policy Commitment: An Analysis under Adaptive Learning *By* Siddhartha Chattopadhyay *South Asian Journal of Macroeconomics and Public Finance* 1-32 (2013)
39. Locating End-of-Life Care in Public Health Context: Is India Prepared for the Discourse? *By* Sengupta J and Chopra Chatterjee S *Indian Anthropologist* Vol. 43, Issue 1. (2013)
40. Macroeconomic Determinants of Employment Intensity of Growth in India *By* Falguni Pattanaik, Narayan Chandra Nayak *Margin: The Journal of Applied Economic Research* 8(2), pp. 137–154 (2014)
41. Managerial Communication Practices and Employees Attitudes and Behaviours: A Qualitative Study *By* Shilpee A.Dasgupta, Damodar Suar & Seema Singh *Corporate Communications: an International Journal* Not yet declared (2014)
42. Measurement of Risk Behaviour: Do Different Approaches Yield Different Results? *By* Hari Kanta Choudhury and Kishor Goswami *Agricultural Economics Research Review* Vol. 27, No. 1 (2014)
43. Multiple commitments as anticidents of teachers' organizational citizenship behaviour. *By* Kumar, S. P. & Giri, V. N. *Journal of IMS Group* 9,1-8 (2012)
44. Organized and Unorganized Employment in the Non-agriculture Sectors in the 2000s *By* Santosh Mehrotra, Ankita Gandhi, Bimal K Sahoo *Indian Journal of Labour Economics* Vol. 55, Issue No. 2 (2013)
45. People's Participation and Public Service Delivery: A Review of Issues and Determinants *By* Debabrata Samanta, Narayan C Nayak *Journal of the Indian School of Political Economy* Accepted (2013)
46. Poetry as an Act of Devotion: Re-reading Arun Kolatkar's Jejuri *By* H S Komalesha with Hari M G *The Atlantic Literary Review* vol.14, no.1 (2013)
47. Re-contextualizing Postcolonial Objectives: A Critico-Epistemic Re-evaluation of Indian Sahitya Akademi Award Winning Texts *By* Saswat Samay Das *Post-Colonial Cultures and Societies, Wright State University, USA* (2013)
48. Re-contextualizing, Sahitya Akademi Objective: A Critico-Epistemic Re-evaluation of Award Winning Texts *By* Saswat Samay Das *IUP Journal of English Studies, Indiana University Press, Hyderabad* (2013)
49. Re-radicalised Interventions into Constituent Media-scapes *By* Saswat S. Das *Media and Utopia, Routledge, USA, UK* accepted (2014)
50. Structural Validity of R-SPQ-2F: A Confirmatory Factor Analysis *By* Soto, C.M. & Pradhan, R. K. *Revista Digital de Investigación en Docencia Universitaria, Peru* 7(1), 11-127. (2013)
51. Teachers Multiple Commitment in Higher Learning Institutions. *By* Kumar, S. P. & Giri, V. N. *International Journal of Physical and Social Sciences*, 2, 156-165 (2012)
52. The mediating role of organizational learning on the relationship among organizational culture, HRM practices, and innovativeness *By* Rahul Raj and Kailash.B.L Srivastava *Management and Labour Studies* Vol.38 (3), pp 201-2 (2013)
53. To Cultivate or Not? Examining Factors that Influence Jatropha Agriculture in North East India *By* Kishor Goswami and Hari Kanta Choudhury *SANDEE Working Paper* No. 82–14, pp.1-27 (2014)

54. Turnaround in India's Employment Story Silver Lining amidst Joblessness and Informalisation? By Santosh Mehrotra, Ankita Gandhi, Partha Saha, Bimal Kishore Sahoo *Economic & Political Weekly* vol xlviII no 35 (2013)
55. Ultra-modern contraception re-examined: Cultural dissent, or son preference? By Zakir Husain, Saswata Ghosh & Mousumi Dutta *Asian Poulation Studies* (2013)
56. Understanding the Household Perceptions of and Adaptations to Heat Wave: A Case Study By Padmanabha Hota and Bhagirath Behera *International Journal of Ecology and Development* 33 (2): 98-117 (2014)
57. Which employees' values matter most in the creation of employer branding? By Biswas, M., & Suar, D. (2013) *Journal of Marketing Development and Competitiveness* 7(1), 93-102 (2013)

### ***Papers Presented in Conferences***

1. Achieving Sustainable Wellbeing (Happiness) and Ecosystem: the Role Human Psyche and Mindfulness, By Bhagirath Behera, *3rd Creative University Conference on Creative Economy, Creative University and Creative Development*, Royal University of Bhutan Convention Ce, (2014)
2. Automated Alertness and Emotion Detection for Empathic Feedback during e-Learning, By S. L. Happy, Anirban Dasgupta, Priyadarshi Patnaik, Aurobinda Routray, *The IEEE International Conference on Technology for Education*, IIT Kharagpur, (2013)
3. Becoming Men in the Global Village(Invited Paper), By Anjali Gera Roy, *Young Sikhs in a Global World: Negotiating Identity, Tradition and Authority*, Lund University Sweden, (2013)
4. Bereavement, posttraumatic stress, and behavioural reactions of tsunami survivors, By Suar, D., Das, S.S., & Alat, P., *XXIII Annual Convention of NAOP India*, NIT Rourkela, (2013)
5. Can changing climate be reversed and/or halted without radically transforming the human psyche?, By Bhagirath Behera, *international conference "Transforamtion in a Changing Climate*, University of Oslo, Norway, (2013)
6. Convergence Initiatives under MGNREGA and Sustainable Rural Development: Experience of Odisha and West Bengal, By Pulak Mishra, Bhagirath Behera, Narayan Chandra Nayak, Neha Jaiswal, *National Workshop on MGNREGA and the Emerging Rural Context: Learnings from Indian States*, Gujarat Institute of Development Researc, (2013)
7. Determinants of Total Factor Productivity of the Software Industry in India, By Bimal Kishore Sahoo, *TIES, Golden Jubilee Conference*, IGIDR, Mumbai, (2013)
8. Development of Women Micro-entrepreneurship in the Handloom Industry: An Empirical Analysis among Tribal Communities in Assam, By Kishor Goswami and Bhabesh Hazarika, *National Seminar on Rural Development in India: Issues, Progress, and Programme Effectiveness*, Itanagar, Arunachal Pradesh, (2013)
9. Does Production of Jatropha Reduce Food Production in North East India?, By Kishor Goswami and Hari Kanta Choudhury, *6th South Asia Economic Summit*, Colombo, Sri Lanka, (2013)
10. Emotional Intelligence, Conflict Resolution and Managerial Styles, By Giri, V. N. & Sengupta, A., *4th International Conference on Cross Cultural Transformation through Emotional Intelligence and Peace Education* □? Jointly Organized by World Without Anger (WWA) and Global Peace Association (GPA), Kathmandu, Nepal, (2013)
11. Emotional Labour: Some Antecedents and Its Consequences, By Rabindra Kumar Pradhan, *23rd Annual Convention of National Academy of Psychology, India*, NIT, Rourkela, (2013)
12. Factor Flows and Export Variety in a Small Open Economy, By Anwesha Aditya, *UGC-Sponsored Seminar on "Contemporary Issues on Development Economics* □?, Rabindra Bharati University, Kolkata, (2014)
13. Gesture-Based Affective and Cognitive States Recognition Using Kinect for Effective Feedback during e-Learning, By Kartik Vermun, Mohit Senapaty, Anindhya Sankhla,

- Priyadarshi Patnaik, Aurobinda Routray, *The IEEE International Conference on Technology for Education*, IIT Kharagpur, (2013)
14. HIV/AIDS: Issues beyond physical body, *By* Kumar, R., & Suar, D., *XXIII Annual Convention of NAOP India*, NIT Rourkela, (2013)
  15. Impact of gender and gender roles on ethical attitude, ethical behavior, and corporate responsibility values, *By* Suar, D., & Gochhayat, J., *XXIII Annual Convention of NAOP India*, NIT Rourkela, (2013)
  16. IMPLICATIONS OF POSITIVE EMOTIONS IN GROWING OUT OF ADVERSITY: EXAMINING THE ROLE OF INDIVIDUAL DIFFERENCES, *By* Papri Nath & Rabindra Kumar Pradhan, *3rd Indian Academy of Management Conference, 2013*, IIM Ahmedabad, India, (2013)
  17. International Prices and Domestic Inflation Linkage: Empirical Evidence for India, *By* Anindita Gandhi and Gourishankar S. Hiremath, *4th International Conference on Applied Econometrics*, ICFAI Business School Hyderabad, (2014)
  18. Investor Sentiment and Cross Sectional Tests of Alternative Asset Pricing Models: Evidences from Indian Stock Market, *By* S.R. Dash and Jitendra Mahakud, *India Finance Conference-2013*, IIM Ahmedabad, (2013)
  19. Is the bell tolling for aged workers? Recent changes in earnings of elderly workers in India, *By* Antara Dhar\*, Mousumi Dutta & Zakir Husain, *b. 55th Annual Conference of Indian Society of Labour Economics*, CESP, JN University, Delhi, (2013)
  20. Is the Indian stock market efficient or adaptive? An Empirical Search, *By* Gourishankar S. Hiremath, Jyoti Kumari, *4th International Conference on Applied Econometrics*, ICFAI Business School Hyderabad, (2014)
  21. Knowledge, Attitude and Practices of Diabetic Patients: Trends and Directions, *By* Ranjan Pattnaik and R K Pradhan, *Global Public Health Conference, 2014*, SRM University, Chennai, TN, India, (2014)
  22. Linking Knowledge management, Innovation, Intrapreneurship, and Organizations Learning in Knowledge Intensive Industries, *By* Srivastava, KBL, *PAN IIM First World Management Conference*, Goa, (2013)
  23. Mental health status of Diabetic Patients: Issues and Challenges, *By* Ranjan Pattnaik and R K Pradhan, *23rd Annual Convention of National Academy of Psychology -2013, India*, NIT, Rourkela, (2013)
  24. On the Memory Train(Invited paper), *By* Anjali Gera Roy, , Loreto College Kolkata, (2013)
  25. Out of Pocket Expenditure and Health Infrastructure in Indian States, *By* Srimoyee Bose\* & Zakir Husain, *83rd Annual Meeting of Southern Economic Association*, Florida, USA, (2013)
  26. Personality and Whistle-blowing: Understanding a Whistle-blower, *By* Sajeet Pradhan & Rabindra Kumar Pradhan, *23rd Annual Convention of National Academy of Psychology, India*, NIT Rourkela, (2013)
  27. Pitching Poetry Against Fundamentalism: A Subaltern Reading of Arun Kolatkar, *By* H S Komalesha with Hari M G, *Revisiting the Contours of English Studies*, EFLU, Hyderabad, (2012)
  28. Pragmatic Functions and their Interaction with Prosodic Features: A Case Study of Bangla Particles, *By* Jayshree Chakraborty, *International Conference of Bengal Studies*, Calcutta University, (2013)
  29. Recent changes in workforce participation of elderly in India: Analysis of NSSO data, *By* Mousumi Dutta\* & Zakir Husain, *Annual Conference of The Indian Econometric Society*, IGIDR, Mumbai, (2013)
  30. Relation of Modal Preference with Performance in Adaptive Hypermedia Context: An Exploration Using Visual, Verbal and Multimedia Learning Modules, *By* Arnab Kumar Hazra, Priyadarshi Patnaik, Damodar Suar, *The IEEE International Conference on Technology for Education*, IIT Kharagpur, (2013)
  31. Strategic role of leadership in sustainability, *By* Srivastava, KBL, *UN-CECAR conference*, Beijing China, (2013)

32. Swamiji on Women, Empowerment and Spiritual Equality, *By* Chhanda Chakraborti, *XXIII World Congress of Philosophy Philosophy as Inquiry and Way of Life*, Athens, Greece, (2013)
33. The Afterlife of the Partition of 1947: Beginning Life Anew in Alien Lands(Plenary Speaker), *By* Anjali Gera Roy, *International Seminar on Partition Literature*, Netaji Subhash Open University, Kolkata, (2014)
34. The Folktale in Achebes Fiction(invited paper), *By* Anjali Gera Roy, *Remembering Chinua Achebe*, University of Mysore, (2014)
35. Trade Liberalisation, Manufacturing Growth and Long run Balance of Trade in India, *By* S Ashwin Kumar, Rakesh Reddy, Gourishankar S. Hiremath, *4th International Conference on Applied Econometrics*, ICFAI Business School Hyderabad, (2014)
36. Understanding the Sectoral Pattern of Growth and its Employment and Productivity Intensity in India, *By* Falguni Pattanaik, Narayan Chandra Nayak, *55th Annual Conference of the Indian Society of Labour Economics (ISLE)*, JNU, New Delhi, (2013)
37. Voice Cues, Keyboard Entry and Mouse Click for Detection of Affective and Cognitive States: A Case for Use in Technology-Based Pedagogy., *By* Bibek Kabi, Amiya Samantaray, Priyadarshi Patnaik, Aurobinda Routray, *The IEEE International Conference on Technology for Education*, IIT Kharagpur, (2013)
38. What Influences Modern Technology Adoption in the Handloom Micro-enterprises? A Tobit Approach, *By* Bhabesh Hazarika and Kishor Goswami, *50th Annual Conference of the Indian Econometric Society*, Mumbai, India, (2013)
39. What the( Female) Body Remembers: Shauna Singh Baldwin and Feminist Narratology, *By* Maninder Kapoor & Seema Singh, *FWSA 2013 conference*, University of Nottingham, UK, (2013)
40. Who will play with me when my mother works: Impact of grandparental presence on labour market outcomes of mothers, *By* Zakir Husain & Mousumi Dutta, *Growth and Development*, Indian Statistical Institute, Delhi, (2013)
41. Yeh hai Mumbai meri Jaan: Requiem for a Cosmopolitan Bombay(Invited Paper), *By* Anjali Gera Roy, *Workshop on Violence, Insurgencies, Deceptions*, National University of Singapore, (2013)

## Department of Industrial & Systems Engineering

### **Head**

Prof. Manoj Kumar Tiwari

### **Professors**

Acharya, Damodar	<i>Ph.D.(IIT Kharagpur),</i>
Banerjee, Rabindra Nath	<i>PGDM (Edinburgh UK),.</i>
Mahanty, Biswajit	<i>Ph.D.(IIT Kharagpur),</i> System Dynamics, Operations Research, Information Systems, Project Management
Maiti, Jhareswar	<i>Ph.D.(IIT Kharagpur),</i> Quality management, Ergonomics & human factors engineering, Safety & risk management, Data analytics
Mohapatra, Pratap Kumar Jagadev	<i>Ph.D.(IIT Kharagpur),</i> System Dynamics and Systems Thinking, E-Business and E-Governance, Production and Operations Management, Quality Engineering and Control, Quantitative Methods
Ray, Pradip Kumar	<i>Ph.D.(IIT Kharagpur),</i> Ergonomics/Human Factors Engineering, Quality Design/Quality Management, Operations and Environmental Management, Optimization of Engineering/Service Systems
Tiwari, Manoj Kumar	, Manufacturing Planning and Scheduling, Logistics and Supply Chain Analysis, Computational Intelligence in Manufacturing and Logistics, Optimisation and Simulation

### **Associate Professors**

Jenamani, Mamata	<i>Ph.D.(IIT Kharagpur),</i> Information System, E-Business
Sarmah, Sarada Prasad	<i>Ph.D.(IIT Kharagpur),</i> Reverse logistics, Supply chain management, Inventory and Operations Management

### **Assistant Professors**

Jha, Jitendra Kumar	<i>Ph.D.(IIT Kanpur),</i> Supply Chain Management, Inventory Control, Facility Location
Kumar, Sri Krishna	<i>Ph.D.(Loughborough, UK),</i> Non Linear Programming, Supply Chain and Logistics, Operations Research, Game Theory
Thakkar, Jitesh J	<i>Ph.D.(IIT Delhi),</i> Supply Chain Management, Lean Manufacturing, Project Management, Service Operations Management, Quality Control and Management

### **Faculty Appointments**

Sri Krishna Kumar	Assistant Professor
Gopinath Chattopadhyay	Visiting Professor

### **Faculty Re-employment**

Professor P.K.J. Mohapatra	Professor
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### ***New Academic Programmes***

Dual Degree - Quality Engineering Design and Manufacturing

### ***Brief Description of on-going activities***

Since its inception the department has been known across the nation for its excellent research potential and capability in the field of industrial engineering and related areas. As a matter of fact, pioneering research in the following areas of industrial engineering and management are being carried out: Operations Management: Production Planning and Inventory Control, Logistics and Supply Chain Management, E-Business, Quality Engineering and Control, Facility Layout and Design, Total Quality Management and Six Sigma. Simulation and Soft Computing: Genetic Algorithms and its variants, Heuristics, System Dynamics, Discrete Event Simulation. Work System Design: Ergonomics/Human Factors Engineering, Occupational Safety and Health Management, and Probabilistic Risk Assessment. Data Analytics and different domains of Industrial Engineering.

### ***Thrust Areas***

1. Manufacturing and Supply Chain Management
2. Industrial Analytics
3. Production, Planning and Control
4. Human Factor and Safety Engineering
5. Optimization and Simulation
6. Quality, Safety and Reliability Engineering
7. Logistics & Supply Chain
8. Decision Support System
9. Big Data
10. Early Warning System
11. E-Business
12. Process Excellence
13. Manufacturing Systems
14. Disaster management
15. Healthcare System
16. Financial Engineering

### ***New Acquisitions***

1. Design for Manufacturing and Assembly Laboratory
2. Quality Design and Control Lab
3. Design for Manufacturing and Assembly Lab
4. Product Development Lab

### ***International Collaborations***

1. The Hong Kong Polytechnic University 2. Yaun Ze University, Taiwan 3. Aix-Marseille Universite, France 4. Management School University of York 5. University of Saskatchewan, Canada 6. Loughborough University, UK 7. EPFL, Switzerland 8. Northeastern University, USA 9. Universidad de Castilla-La Mancha, Spain 10. University of Skovde, Sweden 11. Warwick Manufacturing Group, UK 12. DCU, Ireland 13. Polytechnic University of Milan, Italy

### ***Lectures by Visiting Experts***

1. Robotics Assembly *by* Prof. S.G. Ponnambalam (Monash University)
2. Digital Manufacturing, life cycle modelling *by* Prof. Darek Ceglarek (Warwick Manufacturing Group,UK)

3. Inventory Control in Steel Industry *by* Dr. PVN Nambiar (TATA Steel)
4. Food Supply Chain *by* Prof. Surya Pandey ( Institute for Business Research : University of Waikato, New Zealand)
5. Additive Manufacturing *by* Prof. K.P. Karunakaran (IIT Bombay)
6. Proposed Collaborative Research between University of Missouri Science and Technogy and IITKGP *by* Prof. Venkat Allada (University of Missouri Science and Technogy and IITKGP)
7. Machine Vision and Product development *by* Dr. Pinnamaneni Bhanu (Professor, Computer Science & Engineering chez Rajalakshmi Engineering College, Thandalam,Chennai)

### ***Doctoral and MS Degrees Awarded***

1. Gopal Kumar : Conceptualizing, Analyzing, and Measuring Collaboration: A Supply Chain Perspective(Ph.D.)
2. Lalit Mohan Jha : Adoption of Enterprise Resource Planning Systm in Indian Army(Ph.D.)
3. Srikanth Prabhu : Retinal Biometric Pattern Analysis System(Ph.D.)
4. Purushottam Lal Meena : Sourcing Decisions under the Risks of Supply Disruption and Supplier Satisfaction(Ph.D.)
5. Ajay Pathak : Basel-II risks model development and implementation issues for a Public Sector Bank of India(Ph.D.)
6. O Bala Krishna : Evalution and Design of EOT Crane Operators Job: A Macroergonomic Approach(Ph.D.)
7. Balagopal G Menon : Modeling the Effects of Energy Efficiency Improvements in Personal Transport Sector in India(Ph.D.)
8. Supriya Kumar Ghatak : Modelling the Growth of Ph.D Numbers of an Academic Institute(MS)
9. Ratri Parida : Ergonomic Study of Manual Material Handling Tasks in Construction(Ph.D)
10. Priyabrata Mohapatra : Integration of Process Planning and Scheduling through setup planning in a Reconfigurable Manufacturing Environment(Ph.D)

### ***Member - Professional Bodies***

1. Maiti, Jhareswar, *Senior life member* - Indian Society for Technical Education
2. Maiti, Jhareswar, *Senior life member* - Mining, Geological and Metallurgical Institute of India
3. Maiti, Jhareswar, *Senior life member* - Society for Safety and Fire Engineering
4. Maiti, Jhareswar, *Senior Life Member* - Indian Institution of Industrial Engineering
5. Maiti, Jhareswar, *Regular life member* - Operational Research Society of India
6. Sarmah, Sarada Prasad, *Regular* - AIMS International; The Association of Indian Management Scholar, Houston, USA
7. Sarmah, Sarada Prasad, *Life member* - ISTE
8. Jenamani, Mamata, *Regular* - IEEE
9. Jenamani, Mamata, *Member* - Association for information systems research
10. Tiwari, Manoj Kumar, *Member* - Fellow of National Academy of Engineering, India
11. Tiwari, Manoj Kumar, *Member* - Member of IEEE, US
12. Tiwari, Manoj Kumar, *member* - Member of INFORMS, US
13. Tiwari, Manoj Kumar, *Member* - Institute of Industrial Engineers, USA
14. Thakkar, Jitesh J, *Member* - Indian Institute of Industrial Engineering
15. Thakkar, Jitesh J, *Member* - The Institution of Engineers (India)
16. Jha, Jitendra Kumar, *Member (MIIE 9520)* - Indian Institution of Industrial Engineering Navi Mumbai
17. Jha, Jitendra Kumar, *Life Member* - Indian Society for Technical Education
18. Ray, Pradip Kumar, *Member* - Indian Institute of Materials Management (IIMM), Calcutta, India

19. Ray, Pradip Kumar, *Regular* - INFORMS, USA
20. Ray, Pradip Kumar, *Fellow* - World Academy of Productivity Sciences(WAPS)
21. Mahanty, Biswajit, *Life member* - System Dynamics Society of India

#### ***Member - Editorial Board***

1. Maiti, Jhareswar (0) *Reviewer* - Accident Analysis and Prevention
2. Maiti, Jhareswar (0) *Reviewer* - Safety Science
3. Maiti, Jhareswar (0) *Reviewer* - Computer and Industrial Engineering
4. Maiti, Jhareswar (0) *Reviewer* - Journal of Production Research
5. Ray, Pradip Kumar (2012) *Member* - South Asian Journal of Global Business Research
6. Ray, Pradip Kumar (2013) (*xii*) *Member, Peer Review Board* - PIRJSET
7. Sarmah, Sarada Prasad (0) *Editorial Board member* - Int. Journal of Remanufacturing
8. Thakkar, Jitesh J (2014) *Editor* - Journal of Production Research and Management
9. Tiwari, Manoj Kumar (2011) *Associate Editor* - IEEE Transactions on Systems, Man and Cybernetics: Systems
10. Tiwari, Manoj Kumar (2010) *Editorial Board Member* - European Journal of Operational Research
11. Tiwari, Manoj Kumar (2011) *Associate Editor* - Journal of Computers and Industrial Engineering
12. Tiwari, Manoj Kumar (2009) *Associate Editor* - International Journal of System Science
13. Tiwari, Manoj Kumar (2007) *Editorial Board Member* - International Journal of Computer Integrated Manufacturing
14. Tiwari, Manoj Kumar (2014) *Associate Editor* - Journal of Information Science
15. Tiwari, Manoj Kumar (2007) *Associate Editor* - Journal of Intelligent Manufacturing
16. Tiwari, Manoj Kumar (2008) *Editorial Board Member* - Robotics and Computer Integrated Manufacturing
17. Tiwari, Manoj Kumar (2013) *Associate Editor* - SADHANA
18. Tiwari, Manoj Kumar (2012) *Associate Editor* - Neurocomputing
19. Tiwari, Manoj Kumar (2008) *Editorial Board Member* - Journal of Transportation Security
20. Tiwari, Manoj Kumar (2014) *Editorial Board member* - Production Planning and Control
21. Tiwari, Manoj Kumar (2013) *Associate Editor* - International Journal of Production Research
22. Tiwari, Manoj Kumar (2012) *Associate Editor* - Journal of Decision Support System
23. Tiwari, Manoj Kumar (2008) *Editorial Board Member* - International Journal of Advanced Manufacturing Technology
24. Tiwari, Manoj Kumar (2012) *Guest Editor* - International Journal of Production Economics

#### ***Awards & Honours***

1. Sarmah, Sarada Prasad (2013) *.Rated among top 10 researchers working in Logistics and Supply Chain Management in India (Source: Analysis of the logistics Research in India-White paper published in TU Dortmund University,Germany*
2. Jha, Jitendra Kumar (2013) *Arindam Ghosh (PhD Student ) got the best paper award in XVII Annual International Conference of the Society of Operations Management, IIT Madras, December 20-22*
3. Tiwari, Manoj Kumar (2014) *Awarded as First Rank in IJPR (Taylor & Francis) as Researcher*
4. Jha, Jitendra Kumar (2012) *Best paper award in XVI Annual International Conference of the Society of Opeartions Management, IIT Delhi, December 21-23*
5. Ray, Pradip Kumar (2013) *Distinguished Scholar 2013 by International Association of Research Scholars (IARS), Australia.*
6. Sarmah, Sarada Prasad (2012) *Doctoral student has won 2012 Emerald/European Foundation Management Development (EFMD) Outstanding Doctoral Research Awards*
7. Tiwari, Manoj Kumar (2013) *Fellow of National Academy of Engineering, India*

8. Tiwari, Manoj Kumar (2012) *Rated 2nd among many researchers working in Logistics and Supply Chain Management in India(Analysis of the logistics Research in India-White paper published in TU Dortmund University, Dortmund Germany*

### ***Sponsored Research Projects***

1. A Strategic Capacity Management Framework for Remanufacturing in the Indian Automotive Industry (SRIC, IIT KGP, Rs.4.98 Lakhs)
2. Bid Evaluation, Contract Finalization and Overview of Implementation of SAP-IS Utilities (Central Electricity Supply Utility of Orissa, Bhubaneswar, Rs.0.00 Lakhs)
3. Climate Change Issues and Environmental Performance of Small and Medium Sized Enterprises in India and the UK (UKIERI, Rs.35.00 Lakhs)
4. Data driven sustainable and resilient safety management system for Tata Steel Jamshedpur (Tata Steel, Jamshedpur, Rs.25.68 Lakhs)
5. Designing a Responsive and Efficient Supply Chain for Perishable Items (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
6. Developing comprehensive supply chain performance indices and benchmarks for Indian industry (SRIC, IIT Kharagpur, Rs.4.00 Lakhs)
7. ERP System for the Institute (IER) (IIT Kharagpur, Rs.51.00 Lakhs)
8. Future of Cities (FOC) (MHRD, Rs.2500.00 Lakhs)
9. Hazard Identification and Risk Assessment of Industrial Activities in the ITR, Chandipur (DRDO, Chandipur, Rs.10.00 Lakhs)
10. Information and communication technology and waste control in logistics (MHRD, Govt. of India, Rs.55.00 Lakhs)
11. Information and Communication Technology and Waste Control in Logistics (MHRD, Rs.55.00 Lakhs)
12. Integrated decision support system for food supply chain (, Rs.38.00 Lakhs)
13. Intelligent Decision Support in Online Auction (CSIR, Rs.11.84 Lakhs)
14. Intelligent decision Support in online auction (CSIR, Rs.11.80 Lakhs)
15. Organizational Asset Maturity Model (Tata Consultancy Services, Mumbai, Rs.0.00 Lakhs)
16. Process Audit of Design and Manufacturing of 130-mm-diameter Shell at Ambajhari Plant of Ordnance Factory (Indian Ordnance Factories, Ministry of Defence, Government of India, Rs.29.00 Lakhs)
17. Requirement analysis and stock replenishment decisions for efficient distribution of food grain (MHRD, Govt of India, Rs.50.74 Lakhs)
18. Strategic Options Study for Rural Roads under R. D. Department (Government of Orissa, Rs.0.00 Lakhs)
19. Study on Ancillary Industry of POSCO India (POSCO Research Institute, Seoul, Korea, Rs.0.00 Lakhs)
20. Sustainable food security through technological intervention for production processing and logistics (MHRD, Rs.38.00 Lakhs)
21. Sustainable Food Security Through Technological Interventions for Production Processing and Logistics (MHRD, Rs.2600.00 Lakhs)
22. Sustainable Food Security Through Technological Interventions for Production, Processing & Logistics (MHRD, Rs.2600.00 Lakhs)
23. Technical Audit of Center for Jute Machinery Development (National Jute Board, Kolkata, Rs.0.00 Lakhs)
24. Virtual Lab for Simulation and Gaming (MHRD, Rs.52.00 Lakhs)
25. Vision 2030 of State Pollution control Board, Orissa (State Pollution Control Board, Bhubaneswar, Orissa (2011), Rs.0.00 Lakhs)
26. VLS/21 Gaming and Simulation Lab (MHRD, Rs.52.00 Lakhs)

### *Consultancy Projects*

1. Computerization Corporate contract Management System for NLC (NLC, Rs.2.62 Lakhs)
2. Computerization of Corporate Contracts Management System for NLC (Neyveli Lignite Corporation, Rs.260.00 Lakhs)
3. Construction of Cyclone Shelters in Coastal Orissa (Prime Ministers Office, New Delhi, Rs.0.00 Lakhs)
4. Data Analytics Based Axiomatic Design of Interventions for Job Stress Management (Tata Steel, Jamshedpur, Rs.4.92 Lakhs)
5. Decision Support Model for Optimizing Bulk Material Handling Operations (Dhamra Port Corporation Ltd. Orissa, Rs.11.00 Lakhs)
6. Decision Support Model to Optimize Bulk Material Handling Operations (The Dhamra Port Company Ltd, Rs.10.73 Lakhs)
7. Design and Supervision of Central SLIVER Plant, Chowdar, Orissa (Khadi and Village Industries Commission, Mumbai, Rs.0.00 Lakhs)
8. Development of diesel price escalation formula for HEMM control (CMPDI, Coal India Ltd, Rs.44.00 Lakhs)
9. Development of Diesel Price Escalation Formulae For HEMM Contract (CMPDI, Rs.43.26 Lakhs)
10. Development of Diesel Price Escalation Formulae for HEMM Contract (CMPD Ranchi, Rs.43.26 Lakhs)
11. Development of Educational Complex (Tirupati Assets, Kolkata, Rs.50.00 Lakhs)
12. Dynamic Scheduling and chartering of oil tankers and their solution by simulation based Optimization (Prof L S Thakur, University of Connecticut, Gali, Zaicek, Rs.1.31 Lakhs)
13. Hazard Identification and Risk Assessment of Industrial Activities in the Integrated Test Range, Chandipur (DRDO, Rs.9.00 Lakhs)
14. Hazard Identification and Risk Assessment of Industrial Activities in the ITR, Chandipur (ITR, Chandipur (DRDO), Rs.9.49 Lakhs)
15. Implementation of Reverse Auction Software in NLC (Completed) (Neyveli Lignite Corporation Limited, Rs.29.34 Lakhs)
16. Logistics Solver for Route Optimization and Truck Load Capacity Planning for Proctor & Gamble India Limited (Proctor & Gamble India Limited, Rs.3.00 Lakhs)
17. Modification of E-Proc. Software to comply with Interoperability Guidelines for Digital Signature Certificate for Neyveli Lignite Corporation Limited (Neyveli Lignite Corporation Limited, Rs.13.00 Lakhs)
18. Process Audit of Design and Manufacturing of 130-mm-diameter Shell at Ambajhari Plant of Ordnance Factory (Indian Ordnance Factories, Ministry of Defence, Government of India, Rs.29.00 Lakhs)
19. Reservoir Characterization using Artificial Intelligent Techniques (Soft Computing) (ONGC, Rs.45.00 Lakhs)
20. Safety consultancy services for six laning of Dankuni-Kharagpur section of NH-6 from Km 17.6 to Km 129 in West Bengal (SLNB) (National Highway Authority of India, New Delhi, Rs.90.56 Lakhs)
21. Study, Development and Implementation of Collaborative Framework for Contract Awarding For Neyveli Lignite Corporation (Neyveli Lignite Corporation, Rs.200.00 Lakhs)
22. Studying and analyzing carbon trading regime for Global Collaborative Supply Chain (ACTR) (The University of Sheffield, UK, Rs.1.18 Lakhs)
23. To Study, design, develop, install, test, commission, implement the Web based Reverse Auction Software in NLC Ltd for Neyveli Lignite Corporation (Neyveli Lignite Corporation Limited, Rs.27.00 Lakhs)

### ***Technology Transferred***

1. Dhamara Port - Developed a decision support model for berthing, allocation and rake scheduling : Rs. 10.50 Lakh
2. Proctor and Gambles - Developed an optimal truck loading models for FMCG Items : Rs. 3.00 Lakh

### **Visits Abroad by Faculty Members**

1. Tiwari, Manoj Kumar - Key note speaker (Department of Industrial Engineering, University of Wisconsin-Madison, Wisconsin, USA, ) (July-September, 2006)
2. Tiwari, Manoj Kumar - Speaker (Department of Engineering Management and Systems Engineering, Engineering Management, University of Missouri-Rolla, USA, ) September, 2006
3. Tiwari, Manoj Kumar - Speaker (Wolfson School of Mechanical and Manufacturing Engineering, Loughborough University, UK, ) July, 2006
4. Tiwari, Manoj Kumar - Speaker (Invited Talk on Self Healing architecture of Supply chain, Invited by TU Dortmund University, Dortmund Germany, ) 2013
5. Tiwari, Manoj Kumar - Speaker (WMG( Warwick Manufacturing Group) UK, ) 2009
6. Tiwari, Manoj Kumar - Speaker (School of Business and Economics, University of Exeter, Exeter, UK, ) July, 2006
7. Ray, Pradip Kumar - Invited Resource Person to teach TQM module for Post-Graduate Studies Programme (Papua New Guinea University of Natural Resources and Environment, Rabaul, Papua New Guinea, ) March 18 to 22, 2013.
8. Ray, Pradip Kumar - Invited Keynote Speaker International Conference on Managing the Asian Century (ICMAC-2013) (James Cook University, Singapore in Singapore, ) July 11-13, 2013
9. Ray, Pradip Kumar - Interaction Meet and Discussion on UKIERI project as CI (Aston Business School, Aston University, Birmingham, UK, ) March 9-16, 2014

### **Invited Lectures by Faculty Members**

1. Operational excellence, Kaizen *by* Thakkar, Jitesh J (Lakshmi Machine Works Ltd., Coimbatore)
2. Lean Manufacturing *by* Thakkar, Jitesh J (Bengal Chamber of Commerce)
3. Self Healing in Supply Chain Management *by* Tiwari, Manoj Kumar (IIT Delhi)
4. Swarm Evolutionary and Memetic Computing Conference *by* Tiwari, Manoj Kumar (SOA University, Bhubaneswar, Odisha)
5. Best Practices in Supply Chain Management (BPSCM) *by* Tiwari, Manoj Kumar (SOA University, Bhubaneswar, Odisha)
6. Management-NCRSM *by* Tiwari, Manoj Kumar (ABV- IIT Gwalior)
7. Evolutionary computations in Solving the Manufacturing Planning Problems *by* Tiwari, Manoj Kumar (Jadavpur University)
8. Emerging Trends in Nano-Technology and Innovations in Design and Manufacturing- ETNDM-2006 *by* Tiwari, Manoj Kumar (Rourkela, India)
9. Quality and Reliability *by* Tiwari, Manoj Kumar (Rourkela)
10. Building self healing traits in SCM Network *by* Tiwari, Manoj Kumar (Berlin)
11. Keynote Speaker on 'Performance Improvement of Asian Industries: Emerging Issues and Challenges *by* Ray, Pradip Kumar (James Cook University, Singapore)
12. 113. Invited Lecture on 'Design and Development of Lean Engineering Practices' *by* Ray, Pradip Kumar (JIS College of Engineering, Kalyani, West Bengal)
13. Lecture on 'Multi-Response Optimization of Manufacturing Processes: Modelling and Application' *by* Ray, Pradip Kumar (CMERI, Durgapur, West Bengal)

14. Lecture on 'Workplace Stress and Safety: From MSME Perspectives' at SYNERGY MSME2013 by Ray, Pradip Kumar (Department of Micro & Small Scale Enterprises & Textiles, Government of West Bengal in Calcutta)
15. Lecture on 'Research Issues in Industrial Engineering: Current Perspectives, Challenges and Approach' by Ray, Pradip Kumar (55th National Convention of IIIIE and International Conference on October 24, 2013 in Nagpur, India)
16. Lecture on 'Sustainability Assurance in Organizational Performance: What an Industrial Engineer Can' by Ray, Pradip Kumar (55th National Convention of IIIIE and International Conference on October 25, 2013 in Nagpur, India.)
17. Keynote Speaker on 'Sustainability Assurance in Engineering Systems: Problems, Challenges and Approach' by Ray, Pradip Kumar (SVIET, Mahaboobnagar, Andhra Pradesh)
18. Speaker on 'Workplace Stress Management' at Workshop on Industrial Safety, by Ray, Pradip Kumar (Confederation of Indian Industry (CII), Haldia Zonal Office at Haldia, West Bengal,)
19. Expert Lecture on 'Multi-Criteria Decision Making: An Overview of Methods and their Applications' at by Ray, Pradip Kumar (Production Engineering Department, NIT Agartala, Tripura)
20. Expert Lecture/Keynote Speaker on 'Integrated Approach to Manufacturing Excellence: Contemporary Issue' by Ray, Pradip Kumar (BIT, Sindri, Jharkhand)

#### ***Books Published***

1. Lyes Benyocéf, Jean-Claude Hennem and Manoj Kumar Tiwari: Multi-criteria and Game theory Application in Manufacturing and Logistics *published by* Springer (2013)
2. M K Tiwari, B Mahanty, S P Sarmah and M Jenamani: Modelling of Responsive Supply chain *published by* CRC press, ISBN13: 9781466510340 (2012)
3. M. K. Tiwari, Prof. B. Mahanty, Prof. S.P. Sharma and Prof. M. Jenamani: Modeling of Responsive Supply Chain *published by* CRC Press, Taylor & Francis Group (2012)
4. M.K. Tiwari B. Mahanty S. P. Sarmah M. Jenamani: Modeling of Responsive Supply Chain *published by* CRC Press (2012)
5. Prof F. T. S. Chan and Prof M. K. Tiwari: Swarm Intelligence, Focus on Ant and Particle Swarm Optimization *published by* I-Tech Education and Publishing, Vienna, Austria (2007)
6. Prof. M. K. Tiwari and Jenny A. Harding: Evolutionary Computing in Advanced Manufacturing *published by* Scrivener Publishing, WILEY (2011)

#### ***Short-Term Courses, Training Programmes and Workshops organised***

1. Executive Training Programme on Project Management (11-14 May 2013)
2. One-Day Interaction Meet on 'UKIERI-sponsored Project on Environmental Performance of Industries' (August 2, 2013.)
3. Project Management (11-14 May 2013)
4. Service Science (5 Days)
5. Short-term course on Service Science (July 08-12, 2013)
6. Three-Day Duration Short-Term Course on 'Continuous Improvement and Process Excellence (LMW Executives at LMW Limited, Coimbatore)
7. Workshop on 'Current Industrial Problems and Workplace Stress Management (November 1, 2013)

#### ***Papers Published in Journals***

1. Combined contract for coordinating an RFID enabled supply chain *By* Parthasarathi, G., Sarmah, S.P. and Jenamani, M. *Int. J. Services and Operations Management* Vol. 15, No. 1, 95-1 (2013)

2. A biased random key genetic algorithm approach for inventory-based multi-item lot-sizing problem *By* FTS Chan, Rupak Kumar Tibrewal, Anuj Prakash and MK Tiwari *Proc IMechE Part B: J. of Engineering Manufacture* 1-15 (2014)
3. A Block-based Evolutionary Algorithm for the Flow-Shop Scheduling Problem *By* Pei Chann Chang, Meng-Hui Chen, Manoj Kumar Tiwari, Asif Sikandar Iquebal *Journal of Applied Soft Computing* 13 (12)4536-4547. (2013)
4. A Genetic Algorithm for Optimizing Production in a Cold Rolled Steel Slitting Line *By* Mahanty B. and P. Rakshit *Computer Methods in Materials Science* 13(1), pp. 160-165 (2013)
5. A Modified Desirability Function Approach for Mean-Variance Optimization of Multiple Responses *By* S Kushwaha, S Sikdar, I Mukherjee and P K Ray *Int. Journal of Software Science and Computational Intelligence* 5(3),pp. 7-21 (2013)
6. A Pareto Block Based Estimation and Distribution Algorithm for Multi Objective Permutation Flow Shop Scheduling Problem *By* Anurag Tiwari, Pei Chann Chang, Manoj Tiwari, Nevin Kollanoor *International Journal of Production Research.* (2014)
7. A real time clustering and SVM based price-volatility prediction for optimal trading strategy *By* S Choudhury, S Ghosh, A Bhattacharya, K J Fernandes, and Manoj Kumar Tiwari. *Neurocomputing.* 131,419–426 (2014)
8. Adaptive production control system for a flexible manufacturing cell using support vector machine-based approach *By* Manupati, V.K., Anand, R., Thakkar, J.J., Benyoucef, L., Garsia, F.P., and Tiwari, M.K. *International Journal of Advanced Manufacturing Technology* 67 (1-4), 969-981 (2013)
9. Adaptive production control system for a flexible manufacturing cell using support vector machine-based approach *By* Vijay Kumar, Rohit Ananda, J. J. Thakar, Lyes Benyoucef, Fausto P. Garsia and M. K. Tiwari *International Journal of Advance manufacturing Technology* 67(1-4),969-981. (2013)
10. Algorithm Portfolios for Logistics Optimization Considering Stochastic Demands and Mobility allowance *By* N Shukla, A.K choudhary, P. Prakash, K J fernades, M. K Tiwari, *International Journal of Production Economics.* 141(1),146-166 (2013)
11. An approach to build process-oriented basis for causation based multivariate SPC and process capability analysis *By* Chitta Ranjan, and Maiti, J. *Quality and Reliability Engineering International* 29, 1221-1234 (2013)
12. An integrated inventory problem with transportation in a divergent supply chain under service level constraint *By* Jha, J K and Shanker, K *Journal of Manufacturing Systems* Accepted (2014)
13. An Integrated Revenue Sharing and Quantity Discounts Contract for Coordinating a Supply Chain dealing with Short Life-Cycle Products. *By* Partha sarathy,G., Sarmah S P, Jenamani, M *Applied Mathematical Modelling* Accepted (Online) (2014)
14. Anthropometric Analysis of Crane Operators in Indian Steel Industry *By* Sameer Abdul Azeez, J Maiti, O B Krishna and P K Ray *Industrial Engineering Journal* Vol. VI, Issue 11 (2013)
15. Application of cube model for biomechanical exposure assessment of combined MMH tasks in a manufacturing plant in India *By* R Rajesh, J Maiti and B Samanta *IIE Transactions on Occupational Ergonomics and Human Factors* Accepted (2014)
16. Assessment of risk of musculoskeletal disorders among crane operators in a steel plant: A data mining based analysis *By* Krishna, O.B., Maiti, J., Ray, P.K. and Mandal, Saptarshi *Human Factors and Ergonomics in Manufacturing and Service Industries* (accepted) (2014)
17. Assessment of risk of musculoskeletal disorders among crane operators in a steel plant: A data mining based analysis *By* O B Krishna, J Maiti, P K Ray and Saptarshi Mandal *Human Factors and Ergonomics in Manufacturing and Services* In Press (2014)
18. Collaborative Decision-Making Approach to Measure Green Supply Chain Performance: An Empirical Investigation *By* 7. Arijit Bhattacharya, P. Mohapatra, Vikas Kumar, Prasanta Kumar Dey, Malcolm Brady and Manoj Kumar Tiwari *Production Planning and Control* (2013)



19. Coordination of supply chains by downward direct rebate under symmetric and asymmetric information By Saha S, Sarmah S P *Int. Journal of Integrated Supply Management* Vol.8 (4). pp 193-2 (2013)
20. Development of a Module based Service Family Design for Mass Customization of airline sector using the Coalition Game By Aman Agarwal, F.T.S Chan, Manoj Kumar Tiwari *Computer & Industrial Engineering* 66 (4)827-833. (2013)
21. Do interorganisational relationships and knowledge management practices enhance collaborative commerce adoption? By 18. Chong, Alain Yee Loong Chan, Felix T S Goh, Mark Tiwari, M K *International Journal of Production Research*. 51 (7), 2006-2018 (2013)
22. Double Loop Learning in the Indian Two-Wheeler Service Sector By Bagodi V. and B. Mahanty *The Learning Organization* 20(4/5), pp 264-278 (2013)
23. Integration of Process Planning and Scheduling through Adaptive Setup Planning: A Multi-objective Approach By Priyabrata Mohapatra, Lyes Benoucef, Manoj Kumar Tiwari *International Journal of Production Research* 51 (23-24)7190-7208. (2013)
24. Interpretive Structural Modelling for Critical Success Factors of R&D Performance in Indian Manufacturing Firms By 48. Sushant Tripathy, Pradip Kumar Ray and Sadananda Sahu *Journal of Modelling in Management* Vol.8, No.2 (2013)
25. Key Characteristics-based sensor distribution in multi-station assembly process By Nagesh Shukla, Dariusz Ceglarek and M. K. Tiwari *Journal of Intelligent Manufacturing* (2013)
26. Knowledge management and supporting tools for collaborative networks By Alok, K, Jenny Harding, Luis, M., Lenny, S. C. And M. K. Tiwari *International Journal of Production Research* 51(7),1953-1957. (2013)
27. Logistic planning and inventory optimization using swarm intelligence: A third prospective. By S. K. Kumar, R. R. M. Roy Muddada, M. K. Pandey, B. Mahanty and M. K. Tiwari *International Journal of Advance manufacturing Technology* 65(9-12),1535-1551 (2013)
28. Measuring and Evaluating KM Capability in an Organization: An Exploratory Case Study By Basu, Bhaskar and Ray, Pradip Kumar *VINE: The Journal of Information and Knowledge Management Systems* In Press (2014)
29. Meta-heuristics for manufacturing scheduling and logistics problems By 16. Ching-Jong, Mitsuo Gen, Manoj Kumar Tiwari, Pei-Chann Chang *International Journal of Production Economics*. 141(1),1-3. (2013)
30. Mining Safety Rules for Derailments in a Steel Plant using Correspondence Analysis By J Maiti, Abhijit K Singh, Saptarshi Mandal and Abhishek Verma *Safety Science* Accepted (2014)
31. Modeling robustness for manufacturing processes – a critical review By Mondal, S.C., Ray, P.K., and Maiti, J *International Journal of Production Research* 52, 521-538 (2014)
32. Modeling robustness in serial multi-stage manufacturing processes By Mondal, S.C., Ray, P.K., and Maiti, J *International Journal of Production Research* 51, 6539-6377 (2013)
33. Modelling Robustness in Serial Multistage Manufacturing Processes By Mondal, S C, Maiti, J. and Ray, P K. *Int. Journal of Production Research* DOI:10.1080/00207543 (2013)
34. Near optimal process plan selection for multiple jobs in networked based manufacturing using multi-objective evolutionary algorithms By Manupati, V.K., Thakkar, J.J., Wong, K.Y., Tiwari, M.K. *Computers & Industrial Engineering* 66, 63-76 (2013)
35. Near optimal process plan selection for multiple jobs in networked based manufacturing using multi-objective evolutionary algorithms By K Manupati, J J Thakkar, K Y Wong, Manoj Kumar Tiwari *Computer & Industrial Engineering* 66(1),63-76. (2013)
36. Optimal acquisition price management considering availability of used product in a remanufacturing system By Sarat Jena, Sarmah S P *International Journal of Sustainable Engineering*, doi.org/10.1080/1939 (2013)
37. Patient Flow Modelling and Performance Analysis of Hospital Systems: A Review and Reflections By Bhattacharjee, P. and Pradip Kumar Ray *Computers and Industrial Engineering* In Press (2014)
38. Price and warranty competition in a duopoly distribution channel: Dynamic stability analysis for boundedly rational agents By Sarmah S P, Sinha S, Lalit Kumar *IMA Journal of Management Mathematics* Accepted (2014)

39. Realising Process planning and scheduling Integration through adaptive setup planning By P. Mohapatra, Lyes Benyoucef and M.K. Tiwari *International Journal of Production Research* 51(8),2301–2323 (2013)
40. Relationship preserving multi-attribute reverse auction: A web-based experimental analysis By Arun K. Ray, Mamata Jenamani, Pratap K.J. Mohapatra *Computers & Industrial Engineering* Volume 66, Issue 2, (2013)
41. Risk analysis using FMEA: Fuzzy similarity value and possibility theory based approach□?, Expert Systems with Applications By Mandal, Saptarshi and Maiti, J. *Expert Systems with Applications* 41, 3527-3537 (2014)
42. Shuffled frog leaping algorithm for 0/1 knapsack problem, By Bhattacharjee, K, Sarmah S P *Applied Soft Computing* 19, pp-252-263 (2014)
43. Sourcing decisions under stochastic demand and risk of supply disruptions. By Meena, P L, Sarmah, S.P *International journal of Management Science and Engineering Management* Accepted (2014)
44. Sourcing under supply disruption with capacity-constrained suppliers By Pritee Ray, Mamata Jenamani *Journal of Advances in Management Research* Vol. 10 Iss: 2, (2013)
45. Supply Chain Design Integrated with Risk Pooling By S. K. Kumar and M. K. Tiwari *Computer & Industrial Engineering* 64 (2),580-588 (2013)
46. SWOT of Central Public Works Department India: a case study By Bharti, B.K. and Thakkar, J.J. *Journal of Advances in Management Research* 10 (1), 100-121 (2013)

#### ***Papers Presented in Conferences***

1. A Quadratic Programming Problem for a Dual Market Facility Network Design, By Geet Lahoti, P. Mohapatra, R. P. Mohanty and M. K. Tiwari, *BPSCM-2012*, SOA University, Bhubaneswar, Odhisa, (2012)
2. Approaches of Environmental Performance Measurement and Evaluation for Manufacturing Organizations, By 53. Parag Sen, Pradip Kumar Ray and Sadhan Kumar Ghosh, *International Conference on Managing the Asian Century*, James Cook University, Singapore, (2013)
3. Carbon emission in two stage supply chain., By Ghosh, A, Jha, J K, Sarmah, S P, *17th annual Int. Conference (SOM 2013)*, Held at IIT Madras during, (2013)
4. Channel coordination in closed-loop supply chain management, By Jena, Sarat, Sarmah, S P, *17th annual Int. Conference (SOM 2013)*, Held at IIT Madras, (2013)
5. Coordination and competition in a closed loop supply chain, By Jena, Sarat, Sarmah, S P, *Int conference in supply chain and logistics management (ICSCLM 2013)*, Held at BIMTECH, N Delhi, (2013)
6. Modelling and Managing Patient Flows in a Hospital Outpatient Environment, By Papiya Bhattacharjee and Pradip Kumar Ray, *International Conference on Managing the Asian Century*, James Cook University, Singapore, (2013)
7. Optima spare parts kit in data mining approach, By Moharana, U, Sarmah, S P, *Int. conference in business analytics and Intelligence*, Held at IIM Bangalore, (2013)
8. Optimal production-inventory policy under strict carbon cap in a supply chain, By Ghosh, A., Jha, J. K., and Sarmah S. P, *XVII Annual International Conference of the Society of Operations Management*, IIT Madras, Chennai, (2013)
9. Process plan and scheduling integration for near optimal process plans in networked based manufacturing using controlled elitist NSGA-II and territory defining algorithms, By V K Manupati, J J Thakkar, Priyabrata Mohapatra, Akhilesh Kumar and M K Tiwari, *SEMCCO*, SOA University, Bhubaneswar, Odhisa, (2012)
10. Recent Advancement in Queueing Network Analysis of Hospitals, By Bhattacharjee, P. and Ray, P. K, *16th Annual Int. Conference of Society of Operations Management (SOM)*, IIT Delhi, India, (2012)
11. Risk assessment of e-procurement systems adoption - a fuzzy based approach, By Ramkumar, M., and Jenamani, M., *proceedings in IIE Asian conference*, Singapore, (2012)

12. Sourcing decision under supply disruption and capacity constrained suppliers: a newsvendor approach, *By* Ray, P. & Jenamani, M., *International conference of Society of Operations Management*, IIT Delhi, (2012)
13. Supplier selection and order allocation under supply disruption in multi-product setting, *By* Ray, P., & Jenamani M., *Seventeenth International conference of Society of Operations Management*, IIT Madras, (2013)
14. Sustainable supplier selection through e-procurement - A hybrid MCDM model based on DANP, *By* Ramkumar, M., and Jenamani, M., *Twenty second Annual IPSERA Conference*, Nantes, France., (2013)

## Department of Mathematics

### **Head**

Prof. Umesh Chandra Gupta

### **Professors**

Bhattacharyya, Somnath	<i>Ph.D.(IISc Bangalore)</i> , Computational Fluid Dynamics, Micro-/nanofluidics Modeling
Biswal, Mahendra Prasad	<i>Ph.D.(IIT Kharagpur)</i> , 1. Multi Choice Programming, 2. Stochastic Programming, 3. Fuzzy Programming, 4. Game Theory and applications, 5. Uncertain Programming
Goswami, Adrijit	<i>Ph.D.(Jadavpur Univ)</i> , Operations Research and Theoretical Computer Science
Gupta, Dharmendra Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Numerical Analysis and Computer Science, Constraint Satisfaction Problems
Gupta, Umesh Chandra	<i>Ph.D.(IIT Delhi)</i> , Statistics, Stochastic Modelling, Queueing Theory
Jain, Vinay Kumar	<i>Ph.D.(IIT Delhi)</i> , Zeros of polynomials and analytic functions & Extremal problems of polynomials
Kumar, Somesh	<i>Ph.D.(IIT Kanpur)</i> , Reliability Estimation, Statistical Decision Theory, Reliability Ordering, Entropy Estimation, Estimation Theory, Quantum Information and Computation, Statistical Data Analysis, Experimental Designs, Robust Estimation, Classification under Restrictions, Estimating Parameters of Directional Distributions, Estimation under Constraints
Murthy, P V S N	<i>Ph.D.</i> , Bio-fluid Mechanics, Convective Heat and Mass Transfer in nanofluid
Pandey, Rajnikant	<i>Ph.D.</i> , Differential Equations (Ordinary), Theoretical Numerical Analysis, Singular Boundary Value Problems
Raja Sekhar, G P	<i>Ph.D.(Hyderabad Univ)</i> , Boundary integral methods for viscous flows, Hydrodynamic and thermocapillary study of viscous drops, Applications of binary mixture theory to biological tissues
Roy, Akhil Ranjan	<i>Ph.D.(IIT Kharagpur)</i> , Theoretical Cosmology, Algebra and Application of Soft Set theory, Dynamics of Nonlinear Systems, inventory management
Sarkar, Anjan	<i>Ph.D.(IIT Kharagpur)</i> , Probabilistic Robotics, Remote Sensing Image Analysis, Statistics
Srivastava, Parmeshwary Dayal	<i>Ph.D.(IIT Kanpur)</i> , Functional Analysis & Cryptography, Fuzzy Sequence Space

### **Associate Professors**

Chakraborty, Debjani	<i>Ph.D.(IIT Kharagpur)</i> , Fuzzy Optimization, Fuzzy logic and its applications
Kumar, Pawan	<i>Ph.D.(IIT Kanpur)</i> , Graph Theory
Nahak, Chandal	<i>Ph.D.</i> , Applied Functional Analysis and Optimization, Frame Theory

	in Semi Inner Product Spaces, Fractional Calculus, Numerical Optimization, Set Valued optimization
Nelakanti, Gnaneshwar	<i>Ph.D.(IIT Bombay)</i> , Inverse and ill-posed problems, Spectral approximation of integral operators, Approximate solutions of operator equations
Panda, Geetanjali	<i>Ph.D.</i> , Optimization with uncertainty, Convex Optimization, Numerical Optimization
Panigrahi, Pratima	<i>Ph.D.(Bangalore)</i> , Combinatorics, Graph Theory
<b>Assistant Professors</b>	
Allu, Vasudeva Rao	<i>Ph.D.(IIT Madras)</i> , Univalent Function Theory, Harmonic Mappings (in the Plane), Complex Analysis
Bhowmik, Bappaditya	<i>Ph.D.(IIT Madras)</i> , Geometric function theory (Complex Analysis), Harmonic and Quasiconformal Mappings, Several Complex Variables
Biswas, Debapriya	<i>Ph.D.(Leeds Univ)</i> , Functional Analysis, Lie Groups Lie Algebras and their Representation theory, Complex Analysis, Harmonic Analysis
Dutta, Ratna	<i>Ph.D.(ISI, Kolkata)</i> , Attribute Based Cryptosystems and Broadcast Encryption, Key Pre-Distribution in WSN and Self-Healing, Elliptic Curves and Pairing based Cryptography, Oblivious Transfer and Private Set Intersection Protocols, Lattice-Based Cryptography, Signature and Commitment Schemes
Ganguly, Asish	<i>Ph.D.(Calcutta Univ.)</i> , Mathematical & Theoretical Physics, Quantum Mechanics, Soliton Theory and Inverse Scattering Transformation, Non-linear Evolution Equation in Real & Complex Domain
Gayen, Rupanwita	<i>Ph.D.(Univ of Calcutta)</i> , Linear water waves, Integral equations
Ghoshal, Koeli	<i>Ph.D.(Jadavpur Univ.)</i> , Mathematical Modelling on turbulent flow with sediment, Grain-size distribution in suspension over erodible sediment bed, Study on secondary current
Gupta, Nitin	<i>Ph.D.(IIT Kanpur)</i> , Reliability Theory, Mathematical Statistics, Applied Probability
Kumar, Jitendra	<i>Ph.D.(Univ. of Magdeburg, Germany)</i> , Numerical mathematics, Numerical solutions of integro-partial differential equations, Particle technology
Mukhopadhyay, Sourav	<i>Ph.D.(ISI, Kolkata)</i> , Digital rights management, Cryptanalysis on symmetric cipher, Key management in wireless adhoc network, Algebraic attack on stream ciphers, Key Pre-Distribution (KPS) in sensor network, Time/Memory Trade-off Cryptanalysis, Cloud Computing
Sekhar, T.Raja	<i>Ph.D.(IIT Bombay)</i> , Hyperbolic System of Conservation Laws, Lie Group Analysis for Quasilinear Hyperbolic System of Partial Differential Equations

### ***Faculty Appointments***

Prof. B. Bhowmik	Assistant Professor
Prof. Nitin Gupta	Assistant Professor
Prof. T. Raja Sekhar	Assistant Professor

### ***Faculty Re-employment***

Prof. A.R. Roy	Professor
Prof. Anjan Sarkar	Professor

### ***New Academic Programmes***

Department is assisting for "Financial Engineering" course in the Institute.

### ***Brief Description of on-going activities***

Besides extensive research in the thrust areas viz. Functional Analysis and Fluid Mechanics, significant contribution has also been made by the members of the faculty in the area of Clifford Analysis, Fuzzy Mathematics, Soft Algebra, Bio-Mechanics, Dynamics of Nonlinear systems, Inventory Management, Graph Theory, Integral Equations, Cryptography, Queueing Theory, Statistical Decision Theory, Statistical Data Analysis, Compiler Design, Combinatorics, Fractional Calculus, Optimization Theoretical Computer Science; Information and coding Theory and Cryptology. Faculty members of this department have published number of research papers in reputed international journals on those topics. Number of sponsored research projects are under taken by the faculty members.

Prof. Sourav Mukhopadhyay organizing a "A short term course on Cryptography" during 18-24 May, 2014 at Indian Institute of Technology Kharagpur. "The course is aimed for the students as well as for the professionals working either in industry or in academics who are interested to build a career in the cryptography and related areas. This summer school will bring together the experts in cryptography to give exposure to the latest developments and background of Cryptography. Adequate background material will be provided such that the participant can cope up with the diversity."

Prof U C Gupta and Prof. Geetanjali Panda are organizing an international summer course on PORTFOLIO OPTIMIZATION at Department of Mathematics, Indian Institute of Technology, Kharagpur, from 19th May 2014 to 30th May 2014 under institute funded ISWT-2014 program. The purpose of this course is to describe the process of portfolio optimization techniques employed for investment in financial markets. This course is organized in two modules: Module-A Optimization Techniques used in Financial markets, Module-B Portfolio Optimization Models for Investment. The course is planned and offered as per the norms set by IIT Kharagpur for ISWT subject. Internationally acclaimed academics, researchers and practitioners with proven knowledge, experience, and demonstrable ability in teaching, consultancy, research, and training in the field of financial mathematics and optimization techniques will deliver lectures and discuss cases in the course. Resource persons include professors from Department of Mathematics, IIT Kharagpur, Vinod Gupta School of Management, IIT Kharagpur and international faculties: Prof Duan Li, Department of Systems Engineering and Engineering Management, The Chinese University of Hong Kong and Prof. Xiangyu Cui, School of Statistics and Management, Shanghai University of Finance and Economics, China.

### ***Thrust Areas***

1. Fluid Mechanics and Functional Analysis

### ***New Acquisitions***

1. Dell Desktop computers - 60 units
2. Online UPS 30 KVA - 1 Unit
3. HP Heavy duty Xerox Machine -1unit
4. Hp Laserjet P3015 Printer -1unit

### ***International Collaborations***

Prof. G. P. Raja Sekher has collaborations with (1) Prof. Wolfgang L Wendland, Institute of Applied Analysis and Numerical Simulation, University of Stuttgart, Germany; (2). Prof. Mirela Kohr, Faculty of Mathematics and Computer Science, Babeş-Bolyai University, Cluj-Napoca, Romania, and (3). Prof. Michael Boehm, Centre for Industrial Mathematics, University of Bremen, Germany

Prof. Bappaditya Bhowmik has collaborations with Prof. K-J. Wirths, TU Braunschweyh, Germany.

Prof. Vasudeva Rao Allu has collaboration with 1) Prof. D. Bshouty, Dept. Of Mathematics, Technion-Israel Institute of Technology, Israel, (2) Prof. Hiroshi Yanagihara, Yamaguchi University, Japan, and (3) Prof. Matti Vuorinen, University Of Turku, Finland.

Prof. U. C. Gupta has collaborations with 1. Dr. Srinivas R. Chakravarthy, Department of Industrial and Manufacturing Engineering Kettering University, 1700 West Third Avenue, Flint, MI 48504-4898, USA, and 2. Dr. M. L. Chaudhry, Department of Mathematics and Computer Science, Royal Military College of Canada Kingston, Ontario CANADA

Prof D. Biswas has collaborations with Prof. Vladimir V Kisil, University of Leeds, United Kingdom.

Prof. Somesh Kumar has collaboration with Professor C. Petropoulos, Department of Mathematics, University of Patras, Greece.

Prof. Gnaneshwar Nelakanti has collaborations with Prof. Guangqing Long, Department of Mathematics, GuangXi Teachers Education Universtiy, P. R. China

Prof. S. Bhattacharyya has collaborations with (1) Prof. S. Hardt, TU-Darmstadt, Germany, and (2) . Prof. W. Doerfler, Karlsruher Institut fuer Technologie (KIT), Karlsruher, Germany.

Prof. Jitendra Kumar has collaborations with (1). Professor Dr.-Ing Stefan Heinrich, Institut für Feststoffverfahrenstechnik und Partikeltechnologie, Technische Universität , Germany, (2). Professor Dr. Gerald Warnecke , Professor Dr.-Ing Mirko Peglow and Professor Dr.-Ing Evangelos Tsotsas , Institute of Analysis and Numerical Mathematics Otto-von-Guericke University Magdeburg, Germany, and (3) Professor Doraiswami Ramkrishna, School of Chemical Engineering Purdue University, USA.

Prof. Ashish Ganguly has collaborations with 1. D J Fernandez C, CINVESTAV, Mexico 2. L M Nieto, University of Valladolid, Spain 3. M V Ioffe, Russia 4. S Kuru, Turkey 5. J Negro, Spain

### ***Lectures by Visiting Experts***

1. On the Construction and the Cardinality of Finite Sigma-fields by Prof. P. Vellaisamy (Department of Mathematics, IIT Bombay)
2. Approximate Gcd's and Applications by Dr. Swanand Khara (UoFA, Canada)

3. Potential Methods for Stokes and Brinkman Systems on Lipschitz domains *by* Professor Wolfgang L Wendland (Institute of Applied Analysis and Numerical Simulation, University of Stuttgart, Germany)
4. The Formation of a Stable Bubble Ring in a Couette Device with Taylor Vertices *by* Jai Prakash (Technion, Haifa, Israel)
5. On Ideal Exterior Flows *by* Professor Wolfgang L Wendland (Institute of Applied Analysis and Numerical Simulation, University of Stuttgart, Germany)
6. On a Class of Statistical Convergence Sequences *by* Prof. Rifat Colak (Firat University, Elazig, Turkey)
7. Castelnovo-Mumford Regularity and Gorensteinness of Fiber Cone *by* Dr. Ramakrishna Nanduri (Universit' a degli Studi di Genova)
8. A Mathematical study of the Dynamics of Two Retroviruses, HIV and HTLV-1 *by* Prof. Ram N. Mahapatra (University of Central Florida, USA)
9. On Riesz Minimal Energy Problems on  $Ck-1,1$ -Manifolds *by* Professor Wolfgang L Wendland (Institute of Applied Analysis and Numerical Simulation, University of Stuttgart, Germany)
10. Orthogonal Arrays and Their Construction Procedure *by* Prof. Kashinath Chatterjee (Department of Statistics, Visva-Bharati University, Santiniketan)
11. Surface Potentials and Elliptic Boundary Value Problems *by* Professor Wolfgang L Wendland (Institute of Applied Analysis and Numerical Simulation, University of Stuttgart, Germany)
12. Mathematical and Computational Approaches for the Solution of Differential Equations *by* Prof. Maithili Sharan (Centre for Atmospheric Sciences, IIT Delhi)
13. Issues on Harmonic Univalent Mappings *by* Prof. S. Ponnusamy (Indian Statistical Institute, Chennai Centre.)
14. Research on Quadratic 0-1 Programming *by* Prof. Duan Li (Dept. of Systems Engineering and Engineering Management, The Chinese University of Hong Kong)
15. Integer/Global Optimization *by* Prof. Duan Li (Dept. of Systems Engineering and Engineering Management, The Chinese University of Hong Kong)

#### ***Doctoral and MS Degrees Awarded***

1. Mr. Nihar Kumar Mahato : Variational Inequality and Equilibrium Problems with Generalized Monotonicity(Ph.D)
2. Mr. Dheerendra Mishra : A Study on Privacy and Portability Schemes in Multi-distributor Digital rights Management Systems(Ph.D)
3. Mr. Nabin Kumar Sahoo : Frames, Numerical range and variational inclusion problems in semi-inner product spaces.(Ph.D)
4. Mr. Subrata Bera : Numerical Study of Electrokinetic Flows and Species Mixing in Microchannels(Ph.D)
5. Mr. Prashanth Maraju : Semilocal Convergence of Continuation Methods for Nonlinear Equations in Banach Spaces(Ph.D)
6. Mr. Amit Kumar Barnwal : On a Class of Nonlocal Doubly Singular Boundary Value Problems(Ph.D)
7. Mr. Prakash Goswami : ElectroKinetically Modulated Interfacial Transport in Narrow Confinements(Ph.D)

#### ***Member - Professional Bodies***

1. Raja Sekhar, G P, *Member* - National Academy of Sciences, India
2. Raja Sekhar, G P, *Life Member* - Indian Society of Theoretical and Applied Mechanics
3. Panigrahi, Pratima, *member* - A member of Orissa Mathematical Society
4. Panigrahi, Pratima, *member* - A member of Academy of Discrete Mathematics and Application, India
5. Panda, Geetanjali, *Life member* - Operations Research Society of India



6. Panda, Geetanjali, *Life member* - Orissa Mathematical Society
7. Nahak, Chandal, *Life Member* - Orissa Mathematical Society
8. Nahak, Chandal, *Life member* - Indian Science Congress Association
9. Nahak, Chandal, *Life Member* - Operational Research Society of India
10. Nahak, Chandal, *Member* - Virgia Academy of Science (USA)
11. Gayen, Rupanwita, *Member* - Indian Society for Theoretical and Applied Mathematics
12. Ghoshal, Koeli, *Life member* - The Indian Society for Hydraulics (ISH)
13. Biswas, Debapriya, *Life Member* - The International Society for Analysis, its Applications and Computation (ISAAC)
14. Biswas, Debapriya, *Reviewer* - Mathematical Reviews of AMS (USA)
15. Biswas, Debapriya, *Reviewer* - Thai Journal of Mathematics
16. Dutta, Ratna, *life-member* - CRSI
17. Ganguly, Asish, *Life Member* - Calcutta Mathematical Society Saltlake
18. Ganguly, Asish, *Category S Member* - American Mathematical Society USA
19. Ganguly, Asish, *Life Member* - Indian Association for Cultivation of Science, Jadavpur
20. Allu, Vasudeva Rao, - Life member in Indian Mathematical Society, India
21. Allu, Vasudeva Rao, - Life member in Ramanujan Mathematical Society, India
22. Allu, Vasudeva Rao, - Life member in Forum de Analystes, India
23. Allu, Vasudeva Rao, - Member of American Mathematical Society (Since January 2011)
24. Gupta, Nitin, - Reviewer : Journal of Multivariate Analysis
25. Gupta, Nitin, - Reviewer : European Journal of Operations Research
26. Gupta, Nitin, *Life Member--L17468* - The Indian Science Congress association
27. Gupta, Nitin, *Life member* - Indian Statistical Association
28. Sekhar, T.Raja, - Life Member in The Indian Society of Theoretical and Applied Mechanics (ISTAM), India
29. Sekhar, T.Raja, - Life Member in Ramanujam Mathematical Society, India
30. Srivastava, Parmeshwary Dayal, *Member* - National Academy of Science ,India
31. Gupta, Dharmendra Kumar, - Life member of ISTAM
32. Gupta, Dharmendra Kumar, *Member* - Natioanl Academy of Sciences
33. Biswal, Mahendra Prasad, *Life Member* - Operational Research Society of India
34. Biswal, Mahendra Prasad, *Life Member* - Indian Society of Theoretical and Applied Mathematics
35. Kumar, Somesh, *Life Member* - Forum for Interdisciplinary Mathematics
36. Kumar, Somesh, *Elected Life Member* - National Academy of Sciences
37. Kumar, Somesh, *Life Member* - Indian Society for Probability and Statistics
38. Kumar, Somesh, *Life Member* - Indian Statistical Association
39. Chakraborty, Debjani, *Member* - Indian National Academy of Science, Allahabad
40. Roy, Akhil Ranjan, *Life member* - Indian association of General Relativity and Gravitation , Pune

#### ***Member - Editorial Board***

1. Biswal, Mahendra Prasad (2012) *Member* - OPSEARCH
2. Biswal, Mahendra Prasad (2008) *Member of Editorial Board* - Mathematical Reviews
3. Goswami, Adrijit (2010) *Member, Editorial Board* - International Journal of Fuzzy Systems and Rough Systems
4. Goswami, Adrijit (2010) *Member, Editorial Board* - International Journal of Mathematics in Operational Research (IJMOR)
5. Kumar, Somesh (2014) *Reviewer* - National Academy of Sciences Letters
6. Kumar, Somesh (2013) *Reviewer* - Journal of Statistical Theory and Practice
7. Kumar, Somesh (2013) *Reviewer* - Journal of Statistics and Applications
8. Kumar, Somesh (2011) *Editor* - International Journal of Mathematics and Computation
9. Kumar, Somesh (2013) *Reviewer* - International Journal of Reliability, Quality and Safety Engineering

10. Kumar, Somesh (2014) *Reviewer* - Advances in Statistics
11. Kumar, Somesh (2005) *Editor* - International Journal of Applied Mathematics and Statistics
12. Kumar, Somesh (2011) *Reviewer* - Statistics and Probability Letters
13. Kumar, Somesh (2012) *Reviewer* - Environmental and Ecological Statistics
14. Kumar, Somesh (2013) *Reviewer* - Mathematical Reviews
15. Murthy, P V S N (2009) *Member, Editorial Advisory Board*, - The Open Transport Phenomena Journal, <http://www.bentham.org/open/totpj/>
16. Murthy, P V S N (0) *Member, Editorial Board* - "The Scientific World Journal", <http://www.tswj.com/26827478/>
17. Panigrahi, Pratima (2005) *A member of the Editorial Board* - The Aligarh Bulletin of Mathematics

### **Awards & Honours**

1. Kumar, Jitendra (2013) *Alexander von Humboldt Fellowship for Experienced Researchers*

### **Sponsored Research Projects**

1. A Study on Quantum System with Position-dependent mass in the context of Hermitian/Non-Hermitian Interaction (ISIRD, SRIC, IIT KGP, Rs.3.10 Lakhs)
2. Analytical and Numerical Study of Riemann Problems for Quasilinear Hyperbolic System of Conservation Laws (NBHM, DAE, Rs.10.91 Lakhs)
3. Classification of the actions of semi-simple Lie groups on homogeneous spaces. (SRIC, IIT Kharagpur (ISIRD) (duration 3 years), Rs.1.65 Lakhs)
4. Coefficient bounds, distortion condition for subclasses of univalent functions and Nitsche type conjectures for harmonic univalent functions ( ISIRD, SRIC, IIT Kharagpur, Rs.3.70 Lakhs)
5. Construction of Boolean Functions to Design Cryptographically Secure Stream Cipher (ISIRD, SRIC, IIT-KGP, Rs.5.00 Lakhs)
6. Continuous and periodic review inventory model in Fuzzy and/or Stochastic Environment (Department of Science & Technology, Rs.13.00 Lakhs)
7. Cryptographic support for Digital Rights Management (CSIR, New Delhi, Govt. Of India, October 2012 – October 2015, Rs.30.00 Lakhs)
8. Cryptographic support for Digital Rights Management (CSIR, New Delhi, Govt. Of India., Rs.30.00 Lakhs)
9. Decision Theoretic Inference in Probability Models for Directional Data (Indian Statistical Institute, Kolkata, Rs.5.00 Lakhs)
10. Designing ABE Schemes for Fine-Grained Access Control in DTNs (ISIRD, SRIC, IIT-KGP, July 2011 – July 2014, Rs.5.00 Lakhs)
11. Development of prototype of digital infrared thermal and optical imaging based system for early detection of oral cancer (MHRD, DEPARTMENT OF HIGHER EDUCATION, NEW Delhi, Rs.79.00 Lakhs)
12. Elliptic curves and pairing based cryptography for wireless communication. (Department of Science & Technology(DST), Government of India, July 2012 – July 2015., Rs.10.92 Lakhs)
13. Investigation on residual lifetimes and inactivity times of coherent systems (NBHM, DAE (Dec 2012-Dec 2015), Rs.9.62 Lakhs)
14. Localization and Navigation Using Semantics(thematic), Probabilistic Robotics ,Fourth year (European Aeronautics Defence Space Company, Rs.49.00 Lakhs)
15. Modeling Electrokinetic Flows in Microfluidics (CSIR, Rs.15.00 Lakhs)
16. MODELLING OF AGGREGATION KERNELS OF POPULATION BALANCE EQUATION FOR FLUIDIZED BED GRANULATION ON THE BASIS OF MONTE CARLO SIMULATIONS (ISIRD, SRIC, IIT KHARAGPUR, Rs.4.40 Lakhs)
17. Numerical Study on Electro-Hydrodynamics of Immiscible or Miscible Fluids with Conductivity Gradient (DST, Rs.20.00 Lakhs)

18. On a class of doubly singular boundary value problems arising in Physiology (DST, New Delhi, Rs.8.24 Lakhs)
19. On Some Problems of Concave and Meromorphically Starlike Univalent Functions (NBHM, DAE, Rs.8.63 Lakhs)
20. Redundancy allocations in system (DST (2014-2017), Rs.10.41 Lakhs)
21. Secure Key Management in Wireless Adhoc Network (ISRO, IIT Kharagpur CELL Space Technology Cell, October 2013 – October 2015, Rs.23.68 Lakhs)
22. Studies on the Analytic and Numerical Aspects of Queueing Models (DST, Rs.13.80 Lakhs)
23. WAVE INTERACTION WITH BARRIERS AND FLOATING ELASTIC PLATES (DST, Rs.11.00 Lakhs)

#### ***Consultancy Projects***

1. NIL (, Rs.0.00 Lakhs)

#### ***Patents (filed / granted)***

1. NIL
2. Procedure for Navigation with relations

#### **Visits Abroad by Faculty Members**

1. Bhowmik, Bappaditya - Delivered an invited talk at The 2nd GSIS-RCPAM international symposium on Geometric function theory (Tohoku University, Sendai, Japan, ) September 10--13, 2013.
2. Kumar, Jitendra - Research (Department of Chemical and Process Engineering, University of Magdeburg, Germany, ) 1 year
3. Allu, Vasudeva Rao - To deliver a talk at the conference (Isik University, Istanbul, Turkey, ) August 26--30, 2013
4. Biswal, Mahendra Prasad - Joint Research with Prof Duan Li (The Chinese University of Hong Kong, ) one month ( 6th May, 2013 to 5th June 2013 )

#### **Invited Lectures by Faculty Members**

1. An Overview on Introduction to Cryptography *by* Mukhopadhyay, Sourav (NIT Durgapur)
2. Fuzzy Programming with Single and Multiple Objective *by* Biswal, Mahendra Prasad (OMS ( KIIT Bhubaneswar ))
3. Higher Order Newton Type Methods in Optimization Theory:A Review *by* Panda, Geetanjali (Bhubaneswar)
4. Vector Optimization Problems *by* Nahak, Chandal (UGC Refresher course at Utkal Universit)
5. Mathematical Programming Problems and its Applications *by* Nahak, Chandal (Jadavpur University)
6. Mathematical Programming Problems and its Applications *by* Nahak, Chandal (NIT Durgapur)
7. Regularized gap function as penalty term for constrained optimization problems *by* Nahak, Chandal (OMS Annual Conference, KIIT University Bhubaneswar)
8. Fractional Calculus and its applications *by* Nahak, Chandal (Hindol College, Utkal University)
9. Some open problems on distance regular graphs *by* Panigrahi, Pratima (Jadavpur University, Kolkata)
10. Introduction to mixture theory and applications *by* Raja Sekhar, G P (Andhra University, Visakhapatnam)

11. Boundary Integral Methods and applications to Fluid Mechanics by Raja Sekhar, G P (XXII Congress of AP Society for Mathematical Sciences, Anurag Gropu of Institutions, Hyderabad)
12. Key note Address on ,on the sequence space- an overview of its developments' by Srivastava, Parmeshwary Dayal (Vidyasagar University. ,Midnapore)
13. Operator Ideals using the concept of s-numbers by Srivastava, Parmeshwary Dayal (Orissa Mathematical Society,Bhubaneshwar)
14. Recent developments on gradient based numerical optimization algorithms by Panda, Geetanjali (Bamori, Jalgaon SSBT College of Engineering and Techhnology)
15. Analysis of MAP/R/1 type Queues Using Roots – a Computational Endeavour by Gupta, Umesh Chandra (Calicut)
16. Magnetic drug targeting in permeable microvessels by Murthy, P V S N (National Conference on Pure and Applied Mathematics (NCPAM – 2013), Department of Mathematics, Royal Institute of Technology, Guwahati)
17. Inequalities for the coefficients of meromorphic starlike functions with non-zero pole by Bhowmik, Bappaditya (IIT Indore)
18. Unbounded convex polygons, Blaschke product and concave univalent functions by Bhowmik, Bappaditya (Tohoku University, Japan)
19. Integral Transform and their Applns. by Roy, Akhil Ranjan (Karim CITY college, Jamshedpur)
20. fuzzy OPTIMIZATION by Roy, Akhil Ranjan ( College of ENGG. and Management, Kolaghat)

#### ***Papers Published in Journals***

1. A bi-level multi-choice programming problem By Avik Pradhan and M P Biswal *Journal of Mathematics in Operational Research* Accepted for Publica (2014)
2. A comparative study of different discretizations for solving bivariate aggregation population balance equation By Singh, M. Ghosh, D. Kumar, J. *Applied Mathematics and Computation* 234 (2014)
3. A continuation method and its convergence for solving nonlinear equations in Banach spaces By M. Prashant and D.K.Gupta *International journal of Computational Methods* 10, 1-23 (2013)
4. A Deterministic Key Pre-distribution Scheme for WSN Using Projective Planes and Their Complements By Sarbari Mitra, Sourav Mukhopadhyay, Ratna Dutta *International Journal of Trust Management in Computing and Communications* (2013)
5. A fuzzy random continuous review inventory model with a mixture of backorders and lost sales under imprecise chance constraint By Oshmita Dey, Bibhas Giri and Debjani Chakraborty *International Journal of Operational Research* in Press (2014)
6. A hypersingular integral equation approach to the porous plate problem By R. Gayen and Arpita Mondal *Applied Ocean Research* 46, pp. 70 - 78 (2014)
7. A new approach for university timetabling problems By R.P.Badoni and D.K.Gupta *International journal of Mathematics in Operational Research* 6, 236-257 (2014)
8. A new key Management Scheme for a user hierarchy based on a hybrid cryptosystem By Vanga Odelu, Ashok Kumar Das, Adrijit Goswami *Smart Computing Review* 3 (1) , 42 - 54 (2013)
9. A new sixth order method for nonlinear equations in R By Sukhjit Singh and D.K.Gupta *The Scientific World journal* 2014, 1-5 (2014)
10. A novel linear polynomial-based dynamic key management scheme for hierarchial access control By Vanga Odelu, Ashok Kumar Das, Adrijit Goswami *International Journal of Trust Management in Computing and Communications* 1 (2) , 156 - 174 (2013)
11. A Privacy Enabling Content Distribution Framework for Digital Rights Management By Dheerendra Mishra and Sourav Mukhopadhyay *International Journal of Trust Management in Computing and Communications (IJTMCC)* (2013)

12. A Secure and efficient Uniqueness and Anonymity Preserving remote user authentication scheme for connected health care By Ashok Kumar Das, Adrijit Goswami *Journal of Medical Systems* 37 (3) , 1 - 16 (2013)
13. A study on parametric form of fuzzy line By Debdas Ghosh and Debjani Chakraborty *Journal of Uncertainty in Mathematics Science* 2013 1 -11 (2013)
14. A third order iterative method for Adag By S. Srivastava and D.K.Gupta *International journal of Computing Science and Mathematics* 4, 140-151 (2014)
15. An analytical model for bedload layer thickness By Koeli Ghoshal and Debasish Pal *Acta Mechanica* Vol 225, pp 701-714 (2014)
16. An efficient numerical technique for the solution of nonlinear singular boundary value problems By Singh, R., Kumar J. *Computer Physics Communications* 185 (2014)
17. An explicit model for concentration distribution using biquadratic-log-wake-law in a sediment-laden open channel flow By Snehasis Kundu and Koeli Ghoshal *Journal of Applied Fluid Mechanics* Vol 6(3), pp339-350 (2013)
18. An interpolating by pass to Pareto Optimality in intuitionistic fuzzy technique for a EOQ model with time sensitive backlogging By Sujit Kumar De, Adrijit Goswami, Shib Sankar Sana *Applied Mathematics and Computation* 230, 664-674 (2014)
19. An inventory model for deteriorating items with fuzzy random planning horizon. pp. 185-197 By Soumen Bag and Debjani chakraborty *Advanced Modeling and Optimization* Volume 16, Number 1 (2014)
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### **Papers Presented in Conferences**

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3. A Certificateless Authenticated Key Agreement Protocol for Digital Rights Management System, By Dheerendra Mishra and Sourav Mukhopadhyay, *In the Proceeding of 9th International Conference on Heterogeneous Networking for Quality, Reliability, Security and Robustness (Qshine 2013), LNICST (Springer Lecture Notes of ICST)*, India, (2013)
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Das Gupta, Anirvan	<i>Ph.D.(Kanpur)</i> , Wave propagation, Dynamics of discrete and continuous systems, Mechanics of membranes, Vibration induced particle transport
Das, Manab Kumar	<i>Ph.D.(IIT Kanpur)</i> , Fluid Mechanics Heat Transfer
Das, Prasanta Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Thermal Engineering, Gas-liquid two phase flow- instrumentation and hydrodynamics, CFD for multiphase flow, Nano fluids, Thermo hydraulics of nuclear reactors, Liquid-liquid two phase flow, Experimental thermo-fluid science
Dash, Sukanta Kumar	<i>Ph.D.(IIT Kharagpur)</i> , pressure drop in gas solid flow, free surface flow
Guha, Abhijit	<i>Ph.D.(Cambridge)</i> ,
Kumar, Cheruvu Siva	<i>Ph.D.(IIT Kharagpur)</i> , Robotics, Control Systems, Computer and Telecommunication Networks
Maiti, Biswajit	<i>Ph.D.(IIT Delhi)</i> ,
Maiti, Rathindranath	<i>Ph.D.(IIT Kharagpur)</i> , Mechanical and Fluid Power Transmission and Gear Engineering, Mechanical and Fluid Power Transmission and Gear Engineering
Mohanty, Amiya Ranjan	<i>Ph.D.(Kentucky)</i> , Natural Materials for Noise Control, Machinery Condition Monitoring, Acoustics and Noise Control, Underwater Acoustics, More Research Details at <a href="http://www.iitnoise.com">www.iitnoise.com</a> , Building Acoustics, Mechanical Systems and Signal Processing, Automotive Diagnostics
Mukherjee, Amalendu	<i>Ph.D.(IIT Kharagpur)</i> , System Dynamics and Controls
Nath, Ashish Kumar	<i>Ph.D.(Bombay University)</i> , Laser material interaction and processing, Underwater laser processing, Nontraditional manufacturing processes
Pal, Surjya Kanta	<i>Ph.D (IIT Kharagpur)</i> , Manufacturing Process Modelling and Simulation

Paul, Soumitra	<i>Ph.D.(IIT Kharagpur)</i> , Machining and Grinding, Cutting Tool Coating
Pratihari, Dilip Kumar	<i>Ph.D.(IIT Kanpur)</i> , Soft Computing, Robotics, Manufacturing Science
Ramgopal, Maddali	<i>Ph.D.(IIT Madras)</i> , Refrigeration & air conditioning, Carbon dioxide based natural circulation loops, Solid sorption systems
Ray, Manas Chandra	<i>Ph.D.(IIT Kharagpur)</i> , Fuzzy Fiber Reinforced Composites, Smart Structures, Composite Structures, Nanocomposites, Fluid-structure interaction, Active constrained layer damping
Roy Chowdhury, Asimava	<i>Ph.D.(IIT Kharagpur)</i> , cutter design and manufacture for CTC machine (tea leaf cutting), Rapid prototyping with curved layers - CLFDM (Curved layer fused deposition modeling), CNC machining of free form (curved) surfaces, Direct slicing (without tessellation) for Rapid prototyping, Modification of bicycle to add body thrust
Roy Chowdhury, Samar Kumar	<i>Ph.D.(Birmingham)</i> , Tribology Bio-Tribology Nano-Tribology
Roy, Subhransu	<i>Ph.D.(Penn. State)</i> , Heat Transfer, Laser Processing of Materials, Optical diagnostics for flow and heat transfer
Samantaray, Arun Kumar	<i>Ph.D (IIT Kharagpur)</i> , Systems and Control, Vehicle system dynamics, Rotor dynamics, Nonlinear Mechanics
Satyamurty, V V	<i>Ph.D.(IIT Kanpur)</i> , Flow and Heat Transfer in Porous Media, Solar Energy Thermal Systems, Numerical Heat Transfer and Fluidmechanics
Som, Sankar Kumar	<i>Ph.D.(IIT Kharagpur)</i> ,
<b><i>Associate Professors</i></b>	
Bandyopadhyay, Partha Pratim	<i>Ph.D.(IIT Kharagpur)</i> , Thermally Sprayed coatings, Laser processing of materials
Bhattacharyya, Kingshook	<i>Ph.D (IIT Kharagpur)</i> , Dynamics
Biswas, Kajal	<i>Ph.D.(IIT Kharagpur)</i> , Welding Fracture Mechanics
Chakraborty, Goutam	<i>Ph.D (IIT Kanpur)</i> , Applied Mechanics
Gupta, Sanjay	<i>Ph.D.(Delft)</i> , Biomechanics, Finite Element Analysis, Machine Design
Moulic, Sandipan Ghosh	<i>Ph.D.(Arizona)</i> , Theoretical and computational fluid dynamics and heat transfer, Hydrodynamic and thermal instability, Spectral methods in fluid dynamics, Perturbation methods in fluid dynamics, Mixed convection
Ray, Kumar	<i>Ph.D.(IIT Kharagpur)</i> ,
Saha, Partha	<i>Ph.D.(IIT Kharagpur)</i> , Laser processing of materials, Micro manufacturing, Nonconventional manufacturing, Rapid prototyping
<b><i>Assistant Professors</i></b>	
Das, Arup Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Two phase flow, Microfluidics, Bubble and drop dynamics, Heat transfer, Numerical methods, Fire engineering
Deb, Sankha	<i>Ph.D.(Univ. of Montreal, Canada)</i> , Computer Integrated Manufacturing, Computer-Aided Process Planning for Manufacturing

and Assembly, Automation and Robotics, Intelligent Manufacturing Systems, Manufacturing Processes, Soft Computing techniques in Manufacturing, Flexible Manufacturing Systems

Jayaprakash, K R	<i>Ph.D.(Univ. of ILLINOIS)</i> , Nonlinear Dynamics and Vibrations, Wave Propagation, Nonlinear Waves in Granular Chains
Kalelkar, Chirag Deepak	<i>Ph.D. (IISc., Bangalore)</i> , Rheology, Fluid Dynamics
Panda, Sushanta Kumar	<i>Ph.D.(IIT, Delhi)</i> , Sheet metal forming, Hydroforming, Bulk forming, Formability test design and development, Theory of plasticity for metal forming, Laser and resistance spot welding of sheet metal
Paul, Jinu	<i>Ph.D.(Nanyang Tech. Univ., Singapore)</i> , Material Processing & Characterization, Polymer Nanocomposites, Joining of Materials, More information: <a href="https://sites.google.com/site/jpauliitkgp/home">https://sites.google.com/site/jpauliitkgp/home</a>
Racherla, Vikranth	<i>Ph.D.(Univ. of Pennsylvania)</i> , Failure mechanics, Composite mechanics, Metal plasticity, Numerical modeling of thermo-mechanical processes
Ramanujam, S	<i>Ph.D.(IIT Kharagpur)</i> , IC Engines
Sarangi, Mihir	<i>Ph.D.(IIT Kharagpur)</i> ,
Sidpara, Ajay Muljibhai	<i>Ph.D.(IIT Kanpur)</i> , For more information: <a href="https://sites.google.com/site/sidajay80/">https://sites.google.com/site/sidajay80/</a> , Development of nanofinishing processes for complex surfaces, Magnetorheological fluid based finishing, Micro machining, Unconventional machining processes

#### ***Faculty Appointments***

Jayaprakash K R	Assistant Professor
A.K. Das	Assistant Professor
A.M. Sidpara	Assistant Professor

#### ***Faculty Resignation***

Jayaprakash K R	Assistant Professor
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#### ***Brief Description of on-going activities***

Expert systems in robotics, manufacturing science, medical diagnosis etc. using soft computing

Bio-micro-fluidics and microscale transport processes, Transport Phenomena in Phase Change Problems

Laser materials Processing

CFD/Lattice Boltzmann Method in Complex Flows

High Efficiency Deep Grinding: Modelling & Experimentation

High Pressure Cooling in Machining of Super Alloys

TiN hard coating by unbalanced magnetron using Physical Vapour Deposition Technique

Multi Layer TiN-MoS<sub>2</sub> coating on cutting tools by unbalanced magnetron technique

Machinability study of Inconel 718

Development of control strategies for autonomous underwater vehicles

Softcomputing techniques used in conventional and nonconventional machining

Simulation of liquid sloshing in a tank using numerical grid generation techniques

Prediction of fluid flow and heat transfer from wavy surfaces

Design and development of carbon di-oxide based heat pump systems

3-D printing

Noise and vibration engineering

Lab-on-a-chip based devices

Smart composite materials and structures

Micromechanics of novel radially aligned carbon nanotube reinforced composites

### ***Thrust Areas***

1. High Speed Machining, Grinding and Development of Cutting Tools / Grinding Wheel
2. Micro Manufacturing and Microscale Transport Processes, Laser Materials Processing
3. Bio-mechanics, Bio-micro-fluidics and microscale transport processes
4. Microfluidics, lab-on-a-chip
5. Smart composite materials, micromechanics, radially aligned carbon nanotube reinforced composites

### ***New Acquisitions***

1. Micro Bath (Synchro Electronics, Kolkata) 7.22 Lakhs
2. Server Mounted Rack (Wire Tech, Kolkata) 20.53 Lakhs
3. PHD Ultra I/W Programmable Syringe Pump (Harvard Apparatus, USA) 5.49 Lakhs
4. ANSYS Academic Research Software 5.28 Lakhs
5. Experimental Module Optical Elasto-hydro-dynamics (M/s GUNT, Germany) 5.9 Lakhs
6. CVC 10MR (M/S Ador FonTech, Bangalore) 7.31 Lakhs
7. Motorized Pendulum Impact Test M/C (M/S Instron) 34.96 Lakhs
8. Plasma Hand-held Gun (M/S Ador FonTech) 9.96 Lakhs
9. Zeiss Stereo Microscope (M/S Carl Zeiss, Germany) 10.45 Lakhs
10. Micro Hardness Tester (M/S OMNITECH, Pune) 26.30 Lakhs
11. Fibre Coupled Laser Diode System (M/S New Age Instruments) 128.5 Lakhs
12. Friction Stir Welding Machine (M/S Bangalore Integrated Systems) 196.9 Lakhs
13. Portable TIG Welding Machine (M/S Associate India) 7.05 Lakhs
14. Upgrade of Rapid Prototyping System (DMLS Additive Manufacturing System) 112.7 Lakhs
15. Micrometer (M/S ACIN Instruments) 7.49 Lakhs
16. Climatic Chamber (M/S Kaleidoscope Solution) 41.9 Lakhs



### ***International Collaborations***

Student exchange program with University of South California (USA)

Student exchange program with University of Erlangen (Germany)

Indo-South African Research Collaboration between IIT Kharagpur and Univ. Pretoria (SA).

Research collaboration with Universite des Sciences et Technologies de Lille (France)

UK-India Education and Research Initiative (UKIERI) Project in collaboration with Univ. Southampton (UK)

Research collaboration with Växjö University, Sweden

Indo-US Project/ DST-NSF Project with UIUC and UCI (USA)

DST-JSPS Project with University of Tokyo and Tokai University (Japan)

### ***Lectures by Visiting Experts***

1. Chief Guest Lecture on Research Scholars Day *by* Dr. Guru Prakash (Intel India)
2. You can invent *by* Praveen Vettiyattil (Sharada solutions, Coimbatore, Tamil Nadu)
3. Shape Feature Taxonomy Development for Toolpath Optimization in Incremental Sheet Forming *by* Dr. Amar Kumar Behera (Faculty candidate)
4. Design and prediction of thermodynamic and kinetic behavior of energy storage materials through atomic and bulk scale computation *by* Dr. Jishnu Bhattacharya (Post-doctoral fellow at Northwestern University)
5. Outline And Recent Research Topics Of Railway Technologies *by* Prof Kimihiko Nakano (Institute of Industrial Science, University of Tokyo, Japan)
6. An experimental and numerical investigation on two wire tandem submerged arc welding process *by* Dr. D. V. Kiran (Department of mechanical engineering, KAIST, Daejeon, South Korea)
7. From Macromolecular Structure to Polymer Processing: Bridging length and time scales *by* Dr. Ashish Lele (National Chemical Laboratory, Pune)
8. Computational methods for pre- clinical analysis of orthopaedic implants *by* Dr. Mamadou Bah and Prof. Martin Browne (Southampton University)
9. Advanced Combustion Modeling of Turbulent Sprays *by* Dr. Santanu De (Michigan Technological University)
10. Challenges and Recent Advances in Joint Replacement *by* Dr. Debasis Chakvarty (Fortis Hospital, Kolkata)
11. Micro and nano-fluidics enabled frontiers for bioenergy and biomedical engineering *by* Dr. Alope Kumar (University of Alberta, Canada)
12. Impact of Capillarity and Wetting in Micro-scale Transport *by* Prof. Sushanta Mitra (University of Alberta, Canada)

### ***Doctoral and MS Degrees Awarded***

1. Mr. Satbhai Ojas Shriniwas : Heat Transfer Model For Laser Surface Remelting: Towards A Multi-Scale Solidification Model(MS)
2. Mr. Arindam Bhattacharjee : The Bouc-Wen Hysteresis Model : Analysis, Extension, and New Experimental Application(MS)

3. Mr. Rama Kanta Nayak : Vibration Induced Particle Transport(MS)
4. Mr. Ganesh Tamadapu : Inflation Mechanics and Dynamics of a Hyperelastic Toroidal Membrane(Ph.D.)
5. Mr. Prasanta Kumar Pradhan : Condition monitoring of submersible pump using Motor Current Signature Analysis(Ph.D.)
6. Mr. Sukumar Pati : Some aspects of evaporation and condensation over small scales(Ph.D.)
7. Mr. ShantanuPramanik : Numerical Simulation of Turbulent Jet Flow Over Oblique Wall(Ph.D.)
8. Maha Nand Jha : Electron Beam Welding of Similar,Dissimilar&ReactiveMaterials:Experimental Studies,Modeling and Analysis(Ph.D.)
9. Mr. Shailesh I. Kundalwal : Micromechanical Analysis of Novel Continuous And Short Fuzzy Fiber Rienforced Composites(Ph.D.)
10. Mr.M Mohan Jagadeesh Kumar : Laminar Forced Convection with Viscous Dissipation in the Entrance Region of Annuli Subjected to Constant Temperature(Ph.D.)
11. Mr. Rajib Chakraborty : Heat Transfer in Presence of Electro-Magneto Hydrodynamic Interactions in Narrow Confinements(Ph.D.)
12. Mr.Chippa Shriniwas Pandurang : On the Dynamics of Lubricated Roller Bearings(Ph.D.)
13. Mr. S.Subrahmanyam Mendu : Simulation of Flow and Heat Transfer in Non-Newtonian Fluids Inside Cavities by Lattice Boltzamanna Method(Ph.D.)
14. Pandaba Patro : Gas-Solid Flows in Pipes and Jets : A Computational Investigation(Ph.D.)
15. Rajesh Ghosh : Biomechanical Analyses of the Pelvic Bone And Optimal Design Considerations for Uncemented Acetabular Prosthesis(Ph.D.)

***Member - Professional Bodies***

1. Ray, Manas Chandra, *Life Member* - ISTAM
2. Ramgopal, Maddali, *Member (MIE)* - Institute of Engineers (IE) India
3. Saha, Partha, *Life Member* - Indian Laser Association
4. Chakraborty, Suman, *Member* - ASME
5. Chakraborty, Suman, *Life Member* - ISHMT
6. Chakraborty, Suman, *Member* - APS
7. Pratihar, Dilip Kumar, *Member* - Association for Machines and Mechanisms
8. Pratihar, Dilip Kumar, *Member* - IEEE
9. Pal, Surjya Kanta, *Life member* - Indian Institute of Metals
10. Gupta, Sanjay, *Member* - European Society of Biomechanics
11. Sarangi, Mihir, *Regular* - Society for Experimental Mechanics, Inc., USA
12. Nath, Ashish Kumar, *Life member* - Indian Laser Association
13. Deb, Sankha, *Member* - American Society of Mechanical Engineers(ASME)
14. Das, Arup Kumar, *Member* - Indian Society of Heat and Mass Transfer
15. Das, Prasanta Kumar, *Life member* - Indian Society of heat and mass transfer
16. Kumar, Cheruvu Siva, *Member* - Association of Unmanned Vehicle Systems International (AUVSI)
17. Kumar, Cheruvu Siva, *Editor* - Editorial Board IEEE Access
18. Kumar, Cheruvu Siva, *Member* - American Society of Mechanical Engineers
19. Mohanty, Amiya Ranjan, - Member, Mentor Council on Automobile, Ministry of Labour and Employment, Government of India
20. Mohanty, Amiya Ranjan, - Member, National Committee on Noise Pollution Control, CPCB, Government of India
21. Mohanty, Amiya Ranjan, - Member, Bureau of Indian Standards on National Building Code, Government of India
22. Sidpara, Ajay Muljibhai, *Life time member* - Indian Society of Technical Education (ISTE)
23. Sidpara, Ajay Muljibhai, *Life time member* - Association of Machines & Mechanisms (AMM)

### ***Member - Editorial Board***

1. Bhattacharyya, Souvik (2010) *Editor* - Journal of Nano Energy and Power Research
2. Bhattacharyya, Souvik (2009) *Editorial Board Member* - Int J of Power & Energy Systems
3. Bhattacharyya, Souvik (2011) *Associate Editor* - International Journal of Alternative Energy
4. Chakraborty, Suman (0) *Editorial Board Member* - Scientific Reports (Nature)
5. Chakraborty, Suman (0) *Editorial Board Member* - International Journal of Micro-Nano Scale Transport
6. Chakraborty, Suman (0) *Editorial Board Member* - Journal of The Institution of Engineers (India) Series C
7. Chakraborty, Suman (0) *Guest Editor* - Biomicrofluidics
8. Chakraborty, Suman (0) *Editorial Board Member* - International Journal of Micro and Nano Systems
9. Chakraborty, Suman (0) *Editorial Board Member* - ISST Journal of Mechanical Engineering
10. Chakraborty, Suman (0) *Editorial Board Member* - Open Journal of Thermodynamics
11. Deb, Sankha (0) *Editorial Board Member* - Journal of Modern Manufacturing Technology
12. Gupta, Sanjay (2014) *Editorial Board Member* - Advances in Biomechanics and Application (Techno Press, Korea)
13. Kumar, Cheruvu Siva (2013) *Associate Editor* - Sadhana
14. Kumar, Cheruvu Siva (2012) *Member* - IEEE Access
15. Mohanty, Amiya Ranjan (0) *Technical Acoustics-Editor* - Journal of the Acoustical Society of India
16. Pal, Surjya Kanta (2) *Editorial Review Board Member* - Int. Journal of Materials Forming and Machining Processes
17. Paul, Soumitra (2013) *Associate Editor* - Sadhana - Academy Proceedings in Engineering Sciences
18. Paul, Soumitra (2006) *Member* - International Journal of Abrasive Technology
19. Pratihari, Dilip Kumar (2012) *Member of Editorial Board* - Advances in Robotics Research, an International Journal
20. Pratihari, Dilip Kumar (2008) *Member of Editorial Board* - International Journal of Data Mining, Modelling and Management
21. Pratihari, Dilip Kumar (2013) *Member of Editorial Board* - International Journal of Information Engineering
22. Pratihari, Dilip Kumar (2014) *Associate Editor* - International Journal of Computer Information Systems and Industrial Management Applications
23. Pratihari, Dilip Kumar (2009) *Member of Editorial Board* - Energy and Power Engineering
24. Pratihari, Dilip Kumar (2013) *Member of the Editorial Board* - International Journal of Mechanic Systems Engineering
25. Pratihari, Dilip Kumar (2009) *Member of Editorial Board* - Technology and Investment
26. Pratihari, Dilip Kumar (2012) *Member of Editorial Board* - International Journal of Applied Intelligence
27. Pratihari, Dilip Kumar (2009) *Member of Editorial Board* - Intelligent Information Management
28. Pratihari, Dilip Kumar (2012) *Member of Editorial Board* - International Journal of Advanced Robotic Systems
29. Pratihari, Dilip Kumar (2013) *Member of Editorial Board* - Statistics, Optimization and Information Computing
30. Pratihari, Dilip Kumar (2011) *Member of Editorial Board* - Journal of Control Engineering and Technology
31. Pratihari, Dilip Kumar (2012) *Member of Editorial Board* - International Journal of ISRN Robotics
32. Pratihari, Dilip Kumar (2008) *Member of Editorial Board* - International Journal of Advanced Intelligence Paradigms

33. Pratihar, Dilip Kumar (2011) *Member of Editorial Board* - Intelligent Control and Automation
34. Ramgopal, Maddali (2009) *Member* - Editorial Advisory Board, Buildings & Environment
35. Ray, Manas Chandra (2010) *Editorial Board Member* - Smart Materials Research

#### ***Awards & Honours***

1. Chakraborty, Suman (2014) *INAE Chair Professorship*
2. Bhattacharyya, Souvik (2013) *INAE Outstanding Teacher Award, First Recipient*
3. Chakraborty, Suman (2013) *Santi Swaroop Bhatnagar Prize*
4. Sidpara, Ajay Muljibhai (2013) *SRISTI Technological edge/Strategic Innovation Award in "Gandhian Young Technological Innovation Award 2013" at Indian Institute of Management Ahmedabad.*

#### ***Sponsored Research Projects***

1. A comprehensive study of drop dynamics and its manipulation due to electrowetting (DST, Rs.16.00 Lakhs)
2. Active structural-acoustic control of smart structure using 1-3 piezoelectric composite (DST, Rs.16.00 Lakhs)
3. Advanced research in Mechanical Engineering System (DST FIST program) (DST, Rs.694.00 Lakhs)
4. Aerodynamic design of traction rolling stock with speed potentials of 250 KM/H upgradeable to 350 KM/H (Indian Railways, Rs.734.24 Lakhs)
5. Algae mediated bio-sequestration and storage of carbon dioxide from coal based flue gas and assessment of Algal biomass for animal feed application (WB - DST, Rs.28.00 Lakhs)
6. Biomechanical Assessment of Current and Novel Total Knee Replacement (UKIERI British Council, Rs.10.41 Lakhs)
7. Carbon dioxide based natural circulation loops (CSIR, Rs.13.50 Lakhs)
8. Centre of Excellence for Training and Research in Microfluidics (IIT Kharagpur, Rs.0.00 Lakhs)
9. Creep and warping analysis of hot running loco wheels towards development of design guidelines against gauge widening (Indian Railways, Rs.49.79 Lakhs)
10. Deep drawing of laser welded advanced high strength steels (Department of Science and Technology, Rs.19.02 Lakhs)
11. Demonstration prototype development of transcritical CO<sub>2</sub> based cooling system (DST, Rs.48.00 Lakhs)
12. Design and development of automobile for SAE Formula 1 international competition for students (SRIC, Rs.10.00 Lakhs)
13. Design and development of CO<sub>2</sub> based refrigeration systems (SERB (DST), Rs.40.00 Lakhs)
14. Design and Development of Multi-material deposition system (DST, Rs.1331400.00 Lakhs)
15. DEVELOPMENT & DEMONSTRATION OF 500 W SOFC STACK WITH HYDROGEN AS FUEL & TESTING OF SHORT STACK WITH SYNTHETIC GAS (CSIR, Rs.9.06 Lakhs)
16. Development and performance evaluation of thermally sprayed ball milled diamond-metal composite powder for bearing surface application (DST, Rs.43.00 Lakhs)
17. Development and processing of polymer based nanocomposite materials (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
18. Development of a Schlieren imaging system to study natural convection of heated vertical plate (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
19. Development of Autonomous Underwater Vehicle (completed 2011) (Ministry of Earth Sciences, Rs.693.00 Lakhs)
20. Development of Cage for Mariculture through Numerical and Physical Modeling (Ministry of Earth Science, Government of India., Rs.45.00 Lakhs)

21. DEVELOPMENT OF HIGH TEMPERATURE PULSATING HEAT PIPE BASED PASSIVE COOLING ELEMENT (BARC, Rs.40.47 Lakhs)
22. Development of Remote Laboratory for Computer Integrated Manufacturing System (MHRD, Rs.91.50 Lakhs)
23. Development of Robust Signal Processing Techniques for Detection of Underwater Impact and Burst Noise (UIB) (Ministry of Earth Sciences, Rs.60.00 Lakhs)
24. Development of Sound Proofing Composite Materials using Jute Products (SPC) (JMDC, Kolkata, Rs.32.26 Lakhs)
25. Droplet-based Cooling of Electronic Hot Spots (ISRO, Rs.0.00 Lakhs)
26. Dynamics of Shrouded and Part-span Shrouded Blade Assembly with Floating Mass Damper (GTRE, DRDO, Bangalore, Rs.35.50 Lakhs)
27. Empirical Mode Decomposition of Vibration signals for Fault Detection in Mechanical Systems on Board Naval Platforms (VFM) (NRB, DRDO, Rs.24.90 Lakhs)
28. Establishing a nanofinishing research facility for complex surfaces (SRIC, IIT Kharagpur, Rs.27.25 Lakhs)
29. Establishment of an advanced research facility for EB welding and process development related to programs of interest to DAE (BRNS, DAE, Mumbai, Rs.42.53 Lakhs)
30. Establishment of Nationwide QoS TestBed (completed 2009) (Ministry of Communications and Information Technology, Rs.136.00 Lakhs)
31. Experimental evaluation of forming limit diagram and forming behavior of differently heat treated Inconel-718 material (ISRO, India, Rs.25.56 Lakhs)
32. EXPERIMENTAL INVESTIGATIONS AND THEORETICAL ANALYSIS OF INTERNAL HYDRAULIC JUMP IN CLOSED CONDUITS (DST, Rs.45.11 Lakhs)
33. Extensional Rheometer for Microscale Samples (SERB, Rs.44.41 Lakhs)
34. Finite element analysis of weld location on formability of tailor welded blanks (SRIC, IIT Kharagpur, Rs.4.90 Lakhs)
35. HVOF sprayed ultrahard nanocomposites (DST SERB, Rs.43.00 Lakhs)
36. Integrated green process for biological carbon sequestration coupled with domestic sewage remediation by algae in closed photo bio-reactor (DST, Rs.27.00 Lakhs)
37. Materials for Underwater Vehicles (Ministry of Earth Sciences, Rs.48.00 Lakhs)
38. MIXING OF STRATIFIED LAYERS: EXPERIMENTAL AND NUMERICAL INVESTIGATIONS (ISIRD, IIT Kharagpur, Rs.27.55 Lakhs)
39. Modelling Fish Locomotion in Turbulent Vortices (CSIR, Rs.0.00 Lakhs)
40. Modular Engineering of Vascular Tissue: A Bottom-up Approach (DBT, Rs.0.00 Lakhs)
41. MVL (MHRD, Rs.200.00 Lakhs)
42. National Mission Project on Education through ICT, Developing suitable pedagogical methods (Thermodynamics) (MHRD, Rs.0.00 Lakhs)
43. Numerical simulation of turbulent plane offset jet flow and conjugate heat transfer (Department of Science and Technology, Rs.9.60 Lakhs)
44. On the dynamics of artificial joints (SRIC, IIT Kharagpur, Rs.4.90 Lakhs)
45. Optimal design of human muscle like electro active polymer actuators (DST, Rs.8.14 Lakhs)
46. Optimal design of tough wear resistant nanostructured coatings (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
47. Participation in AUVSI - student coordination (NIOT Chennai, Rs.11.00 Lakhs)
48. Pedagogy (Mechanics of materials) (MHRD, Rs.0.00 Lakhs)
49. Pedagogy Project on Refrigeration and Air Conditioning (National Mission Project on Education through ICT, Rs.0.00 Lakhs)
50. Plant on a Chip (SRIC, IIT Kharagpur, Rs.250.00 Lakhs)
51. Pre-clinical analysis of failure mechanisms and design optimization of acetabular prosthesis (DBT, New Delhi, Rs.23.38 Lakhs)
52. Real Time Virtual Labs (Ministry of Human Resources Development, Rs.743.00 Lakhs)
53. Realtime Virtual Lab on Automotive Systems (RTV-2) (MHRD, Rs.65.00 Lakhs)
54. Remote sensing network for water quality management (ISTP and DBT, Rs.0.00 Lakhs)
55. Research on underwater robotics (SRIC, IIT Kharagpur, Rs.18.00 Lakhs)

56. Robotics for advanced manufacturing applications (Centre for Robotics, IIT Kharagpur, Rs.48.50 Lakhs)
57. Setting up a research and development centre for Damodar Valley Corporation at Kolkata (DVC, Kolkata, Rs.10600.00 Lakhs)
58. Studies on process optimisation and visualisation of laser cladding process (Board for Research in Nuclear Sciences (BRNS), DAE, GOI., Rs.18.86 Lakhs)
59. Study of flow and thermal characteristics in the near field of two parallel plane jets. (COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, Rs.9.56 Lakhs)
60. Suspension and Bogie Technology for High Speed Train (RDSO, Rs.86.00 Lakhs)
61. SYNTHESIS, CHARACTERIZATION, WETTING EFFECTS AND DROP MANIPULATION OF NANOPARTICLE BASED FERROFLUIDS OVER SUBSTRATES UNDER STATIC AND SLIDING MAGNETIC (CSIR, Rs.33.83 Lakhs)
62. Thermomechanically processed high strength bainitic steel rails for Indian Railways (RD & SO, Ministry of Railways, Rs.199.65 Lakhs)
63. Turbulent Flow Computation of Two-Dimensional Incompressible Viscous Flow through a Cascade (ARDB Aerodynamics Panel, Rs.12.61 Lakhs)
64. UKIERI travel grant under thematic partnership in low carbon materials technologies, innovations, and applications (UKIERI, Rs.0.00 Lakhs)
65. Underwater Acoustic Sensors for AUVs (Ministry of Earth Sciences, Rs.48.00 Lakhs)
66. VIRTUAL LAB FOR MULTIPHASE FLOW (MHRD, Rs.0.00 Lakhs)
67. Virtual Laboratory on Mechanical Systems and Signal Processing (VLS/16) (MHRD, Rs.54.00 Lakhs)
68. Virtual Labs (Mechanisms) (MHRD, Rs.17.00 Lakhs)
69. Virtual Labs - Main Phase (Simulation) (MHRD - NMEICT, Rs.823.00 Lakhs)
70. Virtual Labs - Pilot Phase (MHRD - NMEICT, Rs.200.00 Lakhs)
71. VLS-4 (MHRD, Rs.58.00 Lakhs)
72. Wireless Internet (Vodafone Centre of Excellence in Telecommunications / Telecom Centre of Excellence, Rs.48.00 Lakhs)

### ***Consultancy Projects***

1. Application of finite element and other analytical methods for failure analyses of roller bearings (ABC Bearings Limited, Bharuch, Gujarat, Rs.6.00 Lakhs)
2. CAD Modeling and CNC Machining of Engineering components (, Rs.0.50 Lakhs)
3. Demonstration of and advice on finite element analyses of elastic-plastic structures (Usha Martin Limited, Kolkata, Rs.2.00 Lakhs)
4. Design and analyses of roller entry guides (Tata Steel, Rs.2.50 Lakhs)
5. Design of cooling system for Plant Growth Chamber (Scigenics Biotech Private Limited, Rs.1.25 Lakhs)
6. Design of silencers for blowers (DDSB) (M/s. Everest Blowers Pvt. Ltd. Haryana, Rs.0.00 Lakhs)
7. Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning (Pedagogy) (MHRD, Rs.0.00 Lakhs)
8. Development of System for monitoring of slow speed running equipment (SAIL, RDCIS, Ranchi - Completed, Rs.8.50 Lakhs)
9. Experimental sample preparation by Wire Cut EDM (Various institutes, Rs.0.75 Lakhs)
10. Free surface fluctuation in the mold with different types of SEN (IFGL Refractories Ltd, Rs.2.35 Lakhs)
11. Free surface fluctuation in thin slab casting (IFGL Refractories Ltd, Rs.2.35 Lakhs)
12. Inspection and Opinion on Engine and Transmission Sub-Assemblies (ITSA) (BMW India Pvt. Limited, Gurgaon, Rs.0.00 Lakhs)
13. Interpolation of Modern CAD Data and Development of a Homogenization Based Model for Vapour Cloud Explosion of Congested Plants (Shell, Rs.0.00 Lakhs)

14. Laser Processing of Materials (LAPM) (Various Departments / Centres of IIT Kharagpur and Outside Institutions, Rs.0.00 Lakhs)
15. Mathematical model for argon injection into a water mold (IFGL Refractories Ltd, Rs.2.35 Lakhs)
16. Modelling and Simulation of Hydro-pneumatic Shock Isolation System, through Bond Graph on SOMBOLS Shakti (DRDO, R&D(E) Engineers, Through High Tech Cosultance, STEP iit Kharagpur, Rs.15.00 Lakhs)
17. Optimal Design of Leaf Springs (Soni Auto and Allied Industries Ltd., Jamshedpur, Rs.1.11 Lakhs)
18. Refrigerator Noise Control Implementation (RNCI) (Whirlpool of India Ltd., Pune, Rs.0.00 Lakhs)
19. Simulation studies of P15A with modified hanger top (Mazagon Dock Ltd, Rs.28.50 Lakhs)
20. Support and training on trommel design (Tega Industries Limited, Kolkata, Rs.2.50 Lakhs)
21. Training on rolling mill simulation (Tata Steel, Rs.1.00 Lakhs)
22. Vetting of analysis and design of a vibration isolation system (VAVS) (Airef Engineers (P) Ltd., Delhi, Rs.0.00 Lakhs)
23. Wear analysis in laying head pipe (TISCO Jamshedpur, Rs.2.50 Lakhs)

### ***Technology Transferred***

1. Tega Industries Ltd., Kolkata - Trommels with increased screening efficiency : Rs. 15.00 Lakh

### ***Patents (filed / granted)***

1. A BICYCLE DRIVEN BY SIMULTANEOUS/SEPARATE PEDALING AND BODY THRUST
2. A method for inactivity timer configuration based on network signalling reduction
3. A method of maintaining the zone temperature in a variable air volume air conditioning system and a system thereof
4. A spindle assembly for micro-ECM/micro-EDM
5. Active Steer Assisting Differential(ASAD) for Rear Wheel Independent Drive Electric Vehicle(RID EV)using In-Wheel Motors
6. An on line measurement of tool diameter in micro-ECM/micro-EDM
7. An optical fiber-based force transducer for microscale samples
8. Design and development of structured surface for the enhancement of boiling heat transfer
9. Spacer for use in taper roller or angular contact bearings
10. System and method for nanofinishing of a workpiece
11. Trommels for increased screening efficiency

### **Visits Abroad by Faculty Members**

1. Chakraborty, Suman - Invited Lecture-International Symposium on NanoSciences (INSA-German Academy of Sciences) (Halle, Germany, ) Nov 23-28
2. Chakraborty, Suman - Summer School on Nanofabrication and Characterization (Alberta, Canada, ) May 9-17
3. Mohanty, Amiya Ranjan - ICSV 20 (Bangkok, ) July 2013
4. Mohanty, Amiya Ranjan - B&K Meeting (Singapore, ) July 2013
5. Gupta, Sanjay - Ongoing UKIERI collaborative research project (University of Southampton, ) June 16 - July 12, 2013.
6. Bhattacharyya, Souvik - Pan IIT Global Meet 2013 in Houston, Talks in Texas A&M Univ., Alumni meeting in Washington DC (USA, ) 2 weeks
7. Das, Arup Kumar - Research Collaboration (Trinity College Dublin, ) 2 weeks

8. Samantaray, Arun Kumar - Collaborative Research (Polytech Lille, Universite des Sciences et Technologies de Lille, France, ) 11 May 2013 to 11 July 2013

### **Invited Lectures by Faculty Members**

1. Surface coating for micromanufacturing *by* Chattopadhyay, Ajay Kumar (National workshop on Micromanufacturing, Jadavpur University)
2. Automation and Robotics *by* Deb, Sankha (Ordnance Factory Dumdum, Kolkata)
3. Seminar on governance in higher education system *by* Bhattacharyya, Souvik (Kolkata, Univ of Calcutta)
4. Steel: the lane that lies ahead *by* Bhattacharyya, Souvik (International Conference on Automation and information technology in iron & steel making (AITISM 14) at SAIL RDCIS, Ranchi)
5. Biomechanical Analyses & Design Considerations of Hip Prostheses: Numerical & Expt Investigations *by* Gupta, Sanjay (International Workshop on Advances in Healthcare Engineering, College of Engineering & Management, Kolaghat)
6. Current Trends in Coating Technology *by* Bandyopadhyay, Partha Pratim (College of Engineering and Management , Kolaghat)
7. Biomicrofluidics for Medical Applications *by* Chakraborty, Suman (First National Conference on Mapping the “Materials Genome”, Noida)
8. Effect of a Microconfined Fluidic Environment: Droplets/ Cells and Beyond *by* Chakraborty, Suman (Summer School on Nanofabrication and Characterization, Alberta, Canada)
9. Biomicrofluidics *by* Chakraborty, Suman (Microfluidics and Lab on a chip meeting, Bangalore)
10. Cellular Biomicrofluidics *by* Chakraborty, Suman (Fluid Days 2013, IISc. Bangalore)
11. Biomicrofluidics *by* Chakraborty, Suman (International Symposium on NanoSciences under the aegis of INSA-Leopoldina (German Academy of Sciences), Halle, Germany)
12. Hydro-electric Energy Conversion in Nanofluidic Channels *by* Chakraborty, Suman (Indo-US Workshop on Recent Advances in Micro/Nano-scale Heat Transfer and Applications in Clean Energy Technologies)
13. Cells: Complex Droplets or More? *by* Chakraborty, Suman (International conference on Advances in Mechanical Sciences)
14. Nanofinishing: An art of fabrication of high precision components *by* Sidpara, Ajay Muljibhai (Gujarat Technical University)
15. Micro-Extensional Rheometer *by* Kalelkar, Chirag Deepak (SN Bose Center, Kolkata)
16. Optical-fiber based force transducer for microscale samples *by* Kalelkar, Chirag Deepak (National Conference on Emerging Trends in Physics of Fluids and Solids, Jadavpur University, Kolkata)
17. Micro-Extensional Rheometer *by* Kalelkar, Chirag Deepak (Soft-Matter Young Investigators Meeting, Pondicherry)
18. Design and Development of Intelligent Robots *by* Pratihari, Dilip Kumar (BUE, Bankura, WB)
19. Modeling and Analysis of Mechanical Systems Using Soft Computing *by* Pratihari, Dilip Kumar (CEMK Kolaghat)
20. Design Optimization *by* Pratihari, Dilip Kumar (NIT Durgapur)
21. Introduction to Optimization, a Few Tools and Some Applications *by* Pratihari, Dilip Kumar (CMERI, Durgapur)
22. Introduction to Soft Computing and its Applications *by* Pratihari, Dilip Kumar (NIT Durgapur)
23. Modeling and Simulations of Robotic Systems Using Soft Computing *by* Pratihari, Dilip Kumar (CEMK Kolaghat)
24. Use of Soft Computing in Engineering Solutions *by* Pratihari, Dilip Kumar (NIT Durgapur)
25. Nanofinishing of complex surface using magnetorheological fluid *by* Sidpara, Ajay Muljibhai (IIT Kanpur)
26. Application of MRF in finishing of prosthesis implants *by* Sidpara, Ajay Muljibhai (IIT Kanpur)



27. Surface quality requirements for synchrotron mirrors *by* Sidpara, Ajay Muljibhai (Raja Ramanna Centre for Advanced Technology, Indore)
28. Non-associated flow models and effects on macroscopic failure mechanisms *by* Racherla, Vikranth (IIT Kanpur)
29. Role of finite element analyses in modeling manufacturing processes: Challenges and Opportunities *by* Racherla, Vikranth (Prasad V.Potluri Siddhartha Institute of Technology)
30. Water Assisted Laser Material Processing *by* Nath, Ashish Kumar (Photonics- Mumbai, India)
31. Micro- and Nano- machining with Ultrafast Lasers *by* Nath, Ashish Kumar (NIT Rourkela)
32. Lasers and their Scientific and Industrial Applications *by* Nath, Ashish Kumar (NIT Durgapur)

#### ***Books Published***

1. D.K. Pratihari: Soft Computing: Fundamentals and Applications *published by* Narosa Publishing House, New Delhi, India (2014)
2. JP Holman and Souvik Bhattacharyya: Heat Transfer *published by* McGraw Hill (2013)
3. S K Dash: Engineering Equation Solver: Application to Engg and Thermal Engg problems *published by* Narosa (2014)

#### ***Short-Term Courses, Training Programmes and Workshops organised***

1. Power Plant Engineering for CESC Engineers (one week)

#### ***Papers Published in Journals***

1. A Comprehensive Framework for Evaluating IPv6 based Mobility Management Protocols *By* K.Vasu, C.S.Kumar, S.Mahapatra *Wireless Personal Communications* (2014)
2. A Knowledge Based Approach for Automatic Process Plan Generation for Machining *By* Sudeep Kumar Singh and Sankha Deb *International Journal of Advanced Manufacturing Systems* 15(1) (2014)
3. A Mass Conservation Scheme for Level Set Method Applied to Multiphase Flows *By* A. Salih and S. Ghosh Moulic *International Journal for Computational Methods in Engineering Science and Mechanics* 14 (4), 271-289 (2013)
4. A similarity theory for forced convection over horizontal plates *By* S Samanta and A Guha *AIAA J. Thermophysics and Heat Transfer* vol 27, p. 506-514 (2013)
5. A Single Objective Shape Optimization Scheme for Uncemented Hip Stem Design *By* Souptick Chanda and Sanjay Gupta *Indian Journal of Biomechanics* Vol 4 (1), pp 47-51 (2013)
6. A thermomechanical shear lag analysis of short fuzzy fiber reinforced composite containing wavy carbon nanotubes *By* M. C. Ray and S. I. Kundalwal *European Journal of Mechanics - A/Solids* (2013)
7. Achievement of ultrafast cooling rate in a hot steel plate by air atomized spray with different surfactant additives *By* Ravikumar, Satya V., Jha, J M., Sarkar, I., Mohapatra, Soumya S., Pal, Surjya K., and Chakraborty, S., *Experimental Thermal and Fluid Science* 50, pp. 79-89 (2013)
8. Active control of large amplitude vibrations of smart magneto-electro-elastic doubly curved shells, *By* S. C. Kattimani and M. C. Ray, *International Journal of Mechanics and Materials in Design* (2014)
9. Alterations in Streaming Potential in Presence of Time Periodic Pressure-Driven Flow of a Power law Fluid in Narrow Confinements with Non-Electrostatic Ion-Ion Interactions *By* J. Dhar, U. Ghosh, S. Chakraborty *Electrophoresis* 35, 662–669 (2014)

10. An Intelligent Methodology for Optimizing Machining Operation Sequence by Ant System Algorithm By Sneha Singh and Sankha Deb *International Journal of Industrial and Systems Engineering* 16(4), 451-471 (2014)
11. Analysis of forces and surface roughness in magnetic abrasive finishing with a ball-end tool By C. S. Sathua, V. K. Jain, J. Ramkumar, Ajay Sidpara *International Journal of Precision Technology* 3 (2), 131-142 (2013)
12. Analysis of forces on the freeform surface in magnetorheological fluid based finishing process By Ajay Sidpara, V.K. Jain *International Journal of Machine Tools and Manufacture* 69, 1–10 (2013)
13. Analysis of heat transfer and stability of magnetohydrodynamic natural convection above a horizontal plate with heat flux boundary condition By S Samanta and A Guha *Int. J. Heat and Mass Transfer* 70,793-802 10pages (2014)
14. Analysis of pulsed laser bending of sheet metal using neural networks and neuro-fuzzy system By K. Maji, D.K. Pratihar, A.K. Nath *Proc. of IMechE, Part B: Journal of Engineering Manufacture* in press (2014)
15. Analytical and computational solutions for three-dimensional flow-field and relative pathlines for the rotating flow in a Tesla disc turbine By S Sengupta and A Guha *Computers and Fluids* 88, 344-353 10page (2013)
16. Analytical and semi-analytical models of conduction controlled rewetting: a state of the art review By S K Sahu, P K Das, Souvik Bhattacharyya *Thermal Science* p 125, , DOI:10.2298 (2013)
17. Application of digital image processing in tool condition monitoring: a review By Dutta, S., Pal, Surjya K., Mukhopadhyay, S., and Sen, R., *CIRP Journal of Manufacturing Science and Technology* 6, pp. 212-232 (2013)
18. Assessment of Structural Integrity under Dynamic Loading using Path-Independent Integral By Debashis Khan A. Bhushan S. K. Panda & K. Biswas *Mechanics Based Design of Structures and Machines: An International Journal* 41 434-451 (2013)
19. Bone remodelling around cementless composite acetabular components: The effects of implant geometry and implant–bone interfacial conditions By Rajesh Ghosh and Sanjay Gupta *Journal of the Mechanical Behavior of Biomedical Materials* 32, pp 257-269 (2014)
20. Closed-form analytical solutions for laminar natural convection on horizontal plates By A Guha and S Samanta *ASME J. Heat Transfer* 135, 102501-1:9 (2013)
21. Combined influences of electrostatic component of disjoining pressure and interfacial slip on thin film evaporation in nanopores By S. Pati, S. K. Som, S. Chakraborty *International Journal of Heat and Mass Transfer* 64, 304–312 (2013)
22. Computational Study of a Turbulent Wall Jet Flow on an Oblique Surface By S. Pramanik and M.K. Das *International Journal of Numerical Methods for Heat and Fluid Flow* Vol. 24 No. 2, pp. 2 (2014)
23. Computations of Particle Laden Turbulent Jet Flows Based on Eulerian Model By P Patro and S K Dash *ASME Jou of Fluids Engineering* 136, 011301-1-16 (2014)
24. Conduction in composite slabs: Reliability of 1-D and 2-D calculations By Sharma, A.K., Agarwal, V., Das, A.K., Ghosh, S., Das, P.K. *Energy and Buildings* 65, pp. 242-247 (2013)
25. Confinement and focusing of geodesics in warped spacetimes By Kar S., DasGupta A., Ghosh S., Nandan H. *J. of Phys.: Conf. Series* 484, 012019 (2014)
26. Correlation study of tool wear with machined surface texture in end milling By Dutta S., Kanwat, A., Pal, Surjya K., and Sen R., *Measurement* 46(10), 4249-4260 (2013)
27. Determination of optimum specific thrust for civil aero gas turbine engines: a multidisciplinary design synthesis and optimisation By A Guha, D Boylan and P Gallagher *IMechE Proc., Part G, J. Aerospace Engineering* 227, 502-527 26pages (2013)
28. Development and optimization of a sustainable turbofan aeroengine for improved performance and emissions By N Chandrasekaran and A Guha *IMechE Proc., Part G, J. Aerospace Engineering* 227,1701-1719 19page (2013)
29. Development and parametric study of a water-jet assisted underwater laser cutting process By Suhradip Mullick, Yuvraj K. Madhukar, Subhransu Roy, Shailesh Kumar, Dinesh K

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30. Development of a unified model for the steady-state operation of single-phase natural circulation loops By D N Basu, Souvik Bhattacharyya, P K Das *Int J Heat Mass Transfer* Vol 62 Pages 452-462 (2013)
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  32. Development of an in - situ multi - component reinforced Al - based metal matrix composite by direct metal laser sintering technique - Optimization of process parameters By Subrata Kumar Ghosh, Kaushik Bandyopadhyay, Partha Saha *Materials Characterization* Accepted (2014)
  33. Dispersion characteristics of blood during nanoparticle assisted drug delivery process through a permeable microvessel By S. Shaw, S. Ganguly, P. Sibanda, S. Chakraborty *Microvascular Research* 92, 25–33 (2014)
  34. Droplet Transport through Dielectrophoretic Actuation using Line Electrode By S. K. Bhaumik, S. Chakraborty, S. DasGupta *Microfluidics and Nanofluidics (accepted for publication)* (0)
  35. Dynamic Response of a Single-phase Rectangular Natural Circulation Loop to Different Excitations of Input Power By D N Basu, Souvik Bhattacharyya, P K Das *Int J Heat Mass Transfer* v 65, p 131-142 (2013)
  36. Effect of alloyed target vis-à-vis pure target on machining performance of TiAlN coating By Paranjayee Mandal and S Paul *Internation Journal of Advanced Manufacturing Technology* 66(5-8), pp.721-731 (2013)
  37. Effect of carbon nanotube waviness on the effective thermoelastic properties of a novel continuous fuzzy fiber reinforced composite By M. C. Ray and S. I. Kundalwal *Composites Part B* (2013)
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  39. Effect of deposition parameters on TiAlN coating using pulsed DC CFUBMS By Paranjayee Mandal, B D Beake and S Paul *Surface Engineering* 29(4), pp.287-295 (2013)
  40. Effect of Grain Refinement Through Minor Additions of Scandium and Zirconium on the Machinability of Al–Mg Alloys By MS Kaiser, S Datta, PP Bandyopadhyay, A Guha, A Roychowdhury, MK Banerjee *Journal of The Institution of Engineers (India): Series D* 5 (1-8) (2013)
  41. Effect of interfacial Maxwell stress on time periodic electro-osmotic flow in a thin liquid film with a flat interface By M. Mayur, S. Amiroudine, D. Lasseux, S. Chakraborty *Electrophoresis* 35, 670–680 (2014)
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  46. Effects of solvent-mediated nonelectrostatic ion-ion interactions on streaming potential in microchannels and nanochannels By A. Bandopadhyay, J. Dhar, S. Chakraborty *Physical Review E* 033014 (1-10) (2013)
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51. Electrokinetics over charge modulated surfaces in the presence of patterned wettability: Role of the anisotropic streaming potential By U. Ghosh, S. Chakraborty *Physical Review E* 88, 033001 (1-18) (2013)
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55. Experimental investigation of effect of a surfactant to increase cooling of hot steel plates by a water jet By *Journal of Heat Transfer* 135(3), pp. 032101-7 (2013)
56. Experimental study of the effect of spray inclination on ultrafast cooling of a hot steel plate By Ravikumar, Satya V., Jha, J M., Mohapatra, Soumya S., Sinha A., Pal, Surjya K., and Chakraborty, S., *Heat and Mass Transfer* 49, 1509-1522 (2013)
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59. Fault detection in a multistage gearbox by Time Synchronous Averaging of the instantaneous angular speed By Sankar Roy, C.S.Kumar, Amiya Mohanty *Journal of Vibration and Control* (2014)
60. Finite Element Analysis and Experimental Investigations on Laser Bending of AISI 304 stainless steel sheet By Kuntal Maji, Ruchir Shukla, A.K. Nath, D.K. Pratihar *Procedia Engineering* 64, 528 – 535 (2013)
61. Finite element analysis of a hemi-pelvis: the effect of inclusion of cartilage layer on acetabular stresses and strain By Rajesh Ghosh, Bidyut Pal, Debatri Ghosh, Sanjay Gupta *Computer Methods in Biomechanics and Biomedical Engineering*, DOI: 10.1080/10255842.2013.843674. In Press (2013)
62. Finite inflation of a hyperelastic toroidal membrane over a cylindrical rim, By Tamadapu, G. and DasGupta, A. *Int. J. of Solids and Structures* Vol. 51, pp 430- 439 (2013)
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78. Ionic Size dependent electroosmosis in ion-selective microchannels and nanochannels By A. Bandyopadhyay, S. Chakraborty *Electrophoresis (accepted for publication)* (0)
79. Kinematics, dynamics and power consumption analyses for turning motion of a six-legged robot By S.S. Roy, D.K. Pratihari *Journal of Intelligent and Robotic Systems* 10.1007/s10846-013-9 (2013)
80. Laser forming of a dome shaped surface: Experimental investigations, statistical analysis and neural network modeling By Kuntal Maji, D.K. Pratihari, A.K. Nath *Optics and Lasers in Engineering* 53, 31–42 (2014)
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82. LES of Incompressible Turbulent Flow Inside a Cubical Cavity Driven by Two Parallel Lids Moving in Opposite Direction By D.K. Patel, M.K. Das and S. Roy *International Journal of Heat and Mass Transfer* 67, 1039–1053 (2013)
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87. Magnetohydrodynamic free convection flow over a horizontal isothermal flat plate By S Samanta and A Guha *Communications in Nonlinear Science and Numerical Simulation* 18, 3407-3422 16page (2013)
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89. Maxwell stress induced flow control of a free surface electro-osmotic flow in a rectangular microchannel By M. Mayur, S. Amiroudine, D. Lasseux, S. Chakraborty *Microfluidics and Nanofluidics* 16, 721-728 (2014)
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## Department of Metallurgical & Materials Engineering

### **Head**

Prof. Siddhartha Das

### **Professors**

Chakraborti, Nirupam	<i>Ph.D.(Univ. of Washington, USA)</i> , Computational Materials Science Genetic Algorithms Extractive Metallurgy
Chakraborty, Madhusudan	<i>Ph.D.(IIT Kharagpur)</i> ,
Das, Karabi	<i>Ph.D.(Wisconsin, USA)</i> , Metal Matrix Composites, Nanocomposites, Wear of Materials, Physical Metallurgy, Powder Metallurgy, Electron Microscopy
Das, Siddhartha	<i>Ph.D.(Illinois, USA)</i> , Nano Materials, Composite Materials, Physical Metallurgy, Electron Microscopy, Surface Engineering, Failure Analysis, Characterization of Materials, Lead Free Solder Materials
Dutta Majumdar, Jyotsna	<i>Ph.D.(IIT Kharagpur)</i> , Surface Engineering, Corrosion and Environmental Degradation, Laser Materials Processing, Biomaterials, Advanced Processing of Materials, shape memory alloy, Advanced Welding of Materials
Godkhindi, Mahadev Malhar	<i>Ph.D.(IIT Bombay)</i> , powder metallurgy Ceramics
Manna, Indranil	<i>Ph.D.(IIT Kharagpur)</i> ,
Mitra, Rahul	<i>Ph.D.(Northwestern Univ., USA)</i> , Mechanical Behaviour of Materials, Scanning and transmission electron microscopy, Materials for high temperature applications, Composite Materials, Nanocrystalline materials, Thin Film Processing and Characterization, Oxidation behavior of materials
Pabi, Shyamal Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Nanostructured materials Phase transformations Composites Modelling and simulation
Ray, Kalyan Kumar	<i>Ph.D.(IIT Bombay)</i> , Mechanical Metallurgy, Physical Metallurgy, Fracture Mechanics, Nondestructive Evaluation, Structural Integrity, Failure Analysis, Advanced Structural Materials, Stereology, Modelling and Simulation, Metal Matrix and Ceramic Matrix Composites
Roy, Gour Gopal	<i>Ph.D.(IIT Kanpur)</i> , Alternative Routes of Iron & Steel making, Modelling of Heat & Mass Transfer in Materials Processing, Electron Beam Welding
Roy, Sanat Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Mineral Processing, Extractive Metallurgy, Environmental Degradation of Materials, Laser Processing of Materials, Electronic and magnetic nanomaterials
Singh, Shiv Brat	<i>Ph.D.(Cambridge Univ,UK)</i> , Physical metallurgy of steel

### **Associate Professors**

Acharya, Narendra Nath	<i>Ph.D.(IIT Kharagpur)</i> , Artificial Intelligence, Powder Metallurgical Applications, Multi-Media, Educational Technology, Photography
Biswas, Koushik	<i>Ph.D. (Univ.of Stuttgart, Germany)</i> , Energy materials (Hydrogen storage - Solid Oxide Fuel Cell - Lithium Ion Battery), Abinitio (DFT)

and MD Modeling, Electroceramics (Ferroelectric - Pyroelectric - Relaxor - Multiferroics), Structural Ceramics (ZrO<sub>2</sub> - Al<sub>2</sub>O<sub>3</sub> - TBC - SiC), Ceramic Reinforced Metal Matrix Composites (steel and Al-based MMC with SiC - TiC-other Carbide), Sintering (Conventional - Microwave - SPS)

- Chakrabarti, D *Ph.D.(Univ. of Birmingham, UK)*, Microstructure property correlation in metals, Development of microstructure and texture in thermo-mechanical processing, Fracture toughness and fracture transition behaviour in metals, Development and effect of mixed grain structures in metals, Segregation during solidification and its effect on properties, Modelling based on dislocation theory, Defect initiation and its control in metals
- Ghosh, Sudipto *Ph.D (IIT Kanpur)*, 1. Mathematical Modeling of Material processes, 2.Solidification Processing Metal Matrix Composites, 3.Fabrication of Lithium Ion Batteries, 4.Deformation Behavior of Materials
- Sant, Sudhindra B *Ph.D.(Queen's Univ., Canada)*, Thin Film Electronic Materials and Nanostructures, Spintronic Thin Films, Defects in Thin Film Semiconductors, Wide band-Gap Semiconductors, MEMS devices, Photovoltaic Thin Films, Biomaterials and Biomimetics, Nanomaterials and Nanocrystalline Plasticity

***Assistant Professors***

- Aich, Shampa *Ph.D.(Univ.of Nabraska, USA)*, Rapid Solidification, Magnetic Materials, Shape Memory Alloys, Surface Modifications, Biomaterials
- Bandyopadhyay, Tapas Kumar , 1. Metal Matrix Composite 2. Material Processing 3. Intellectual Property-Transaction 4. Policy
- Bhaduri, Amit *M.Tech.(IIT Kanpur)*, STRUCTURE-PROPERTY RELATIONSHIP.
- Das, Jayanta *Ph.D.(TU Dresden, Germany)*, Solidification and Non-equilibrium Processing, Metastable and Nanostructured Alloys, High Temperature Oxidation, Structure-Property Relationship, Phase Transformation
- Kar, Sujoy Kumar *Ph.D.(The Ohio State Univ.)*, Physical and Mechanical Metallurgy, Processing-Microstructure-Microtexture-Property Relationship, Materials and property modeling, Materials systems: Ti alloys and Ni based superalloys and steels for power plant applications
- Kundu, Tarun Kumar *Ph.D(Lulea univ of Tech,Sweden)*, Atomistic Simulations of Materials, Extractive Metallurgy, Computational Fluid Dynamics, Mineral processing
- Laha, Tapas *Ph. D.(Florida Int.Univ., Miami)*, Nanocomposites - Processing & Characterization, Interfacial Phenomena, Surface Engineering & Coating, BMG Nanocomposites, Materials Processing via Spark Plasma Sintering
- Roy, Mangal *Ph.D.(Washington State Univ.)*, Biomaterials, Ceramics, surface modification
- Sen, Indrani *Ph.D.(IIS)*,

### ***Faculty Appointments***

Dr. Mangal Roy                      Assistant Professor

Dr. Indrani Sen                      Assistant Professor

### ***Chair Professor***

Ghosh, R.N.                      Ph.D. (IIT Kharagpur)                      Physical Metallurgy

### ***Chair Professor***

Sen, P.K.                      Ph.D. (Jadavpur University)                      Process Metallurgy

### ***Brief Description of on-going activities***

The Research and Development Program of the Department encompasses various areas like Corrosion Science and Technology, Extractive Metallurgy, Mechanical Metallurgy, Melting, Casting and Solidification Processing, Modeling, Simulation and Multimedia in Metallurgical Engineering, Physical Metallurgy, Powder Metallurgy, Surface Engineering etc. In the field of Extractive Metallurgy significant contributions for metal value extraction, particularly Cu, Ni and Co from sea nodules has been made. Direct reduction of iron ore using mine generated ore and coal fines is another major research area. In the domain of Mechanical Metallurgy, a pioneering achievement has been the design and development of fatigue testing using rotating bending machine to study short, long and non-propagating crack behaviour in several steels. Investigations related to structure-property relationship of various ceramic and metal-matrix composites, high temperature materials and advanced alloys are thrust areas of activity. Development of newer grades of dual phase and micro alloyed steels through fracture based studies, correlation between fracture and wear characteristics of materials, development of thin sheet steel components are some important fronts in this direction. In addition, research is progressing in the area of mechanical behaviour of small volume materials. The major areas in the field of Melting, Casting and Solidification Processing include: development of cast micro-alloyed steels, studies on the hot tearing of long freezing range Al alloys, austempered ductile iron through non-conventional route, grain refinement of Al alloys and the development of cast metal matrix composites. Success has been achieved in improving the mechanical properties of some hypoeutectic and eutectic Al-Si alloys by combined grain refinement and modification treatment using indigenously developed Al-B and B rich Al-Ti-B master alloys and Sr, respectively. In addition to mathematical modeling works in the areas of surface engineering, phase transformation, solidification processing, fracture & fatigue, some more new areas have surfaced and these are: application of genetic algorithm for the optimization of metallurgical systems, mathematical simulation of welding, iron and steel making, and other high temperature metallurgical systems by application of computational fluid dynamics, and heat and mass transfer, atomistic simulation of gas hydrates, molecular dynamic simulation of nanostructured materials etc. Several Al-Cu-TM and Al-TM-Si (TM = transition metal) Al-Ni-Ti ternary alloys, and Al-alloys containing rare earth metals have been synthesized and characterized to explore the possibility of developing bulk amorphous Al-alloy by mechanical alloying and identifying the criteria of selection of such amorphous alloy compositions. The present activities of the Powder Metallurgy group include synthesis of particulate reinforced mullite and their property evaluation, production of Al<sub>2</sub>O<sub>3</sub> reinforced Ni<sub>3</sub>Al through reaction sintering route, reaction sintering of silicon carbide, recovery of copper from printed circuit etchant sludge and production of silicon carbide from fly ash silica. Research has been initiated in the area of semi-solid processing for casting and forming operations of Al-alloy matrix composites. In addition, significant progress has been achieved in the synthesis of Fe-TiC, Fe-ZrC and Fe-TiB<sub>2</sub> composites from cheaper raw materials by aluminothermic reduction method. Development of low temperature copper based composites, steel matrix composites are also prominent areas in the area of composite materials. Activities related to surface engineering involves laser assisted surface modification, ion implantation and plasma spray deposition, development of nano-structured coating by electro-deposition. The research activities in the area of Environmental Degradation embraces

fundamental studies relating to film/scale growth processes on different metal-oxygen and metal-halogen systems with emphasis on kinetics and growth mechanisms, defect structures of compounds, transport properties of different species, adhesion and protective properties of the scales etc. Studies on high temperature oxidation behaviour of multi-phase refractory metal-silicides like Molybdenum and Niobium Silicides are in progress. In the area of aqueous corrosion, the current activities are concentrated on the studies relating to corrosion behaviour of amorphous and nanocrystalline Zr-based binary alloys, corrosion and stress corrosion performance of aluminum based composites and Al-Ni alloys and stress corrosion cracking of nickel alloys in hydrogen fluoride environment. Development of lead free Sn based solder material, and solid oxide fuel cell are also some areas of active research. In the area of joining research on joining of similar and dissimilar materials using electron beam welding is getting prominence. Development of Lithium Ion Battery (LIB) Technology for applications in Electric Vehicles in India has taken the role of a prominent research area in the Department.

### ***Thrust Areas***

1. CLASSICAL METALLURGY AND MATERIALS SCIENCE i. Extractive metallurgy; ii. Solidification and nonequilibrium processing; iii. Metastable alloys and Phase transformation; iv. Deformation and fracture behavior; v. Joining of metals; vi. Corrosion behavior and high temperature oxidation; vii. Powder Metallurgy
2. COMPUTATIONAL MATERIAL SCIENCE i. Modeling and simulation in process metallurgy; ii. Modeling of phase transformation kinetics; iii. Molecular dynamics; iv. Design & scale-up of metallurgical processes; v. Modeling and simulation of iron making processes
3. IRON AND STEEL i. Raw material processing and mineral beneficiation; ii. Advanced auto-grade steel; iii. Improvement in mechanical properties like creep, fatigue, fracture and non-destructive testing
4. ADVANCED MATERIALS i. Composites & functionally graded materials; ii. Nanomaterials and nanocomposites; iii. Surface engineering & Interfacial phenomena; iv. Thin film coatings; v. Biomaterials; vi. Lithium ion battery; vii. Solid oxide fuel cells (SOFCs)

### ***New Acquisitions***

1. Fully Automated Sequential WD X Ray Fluorescence Spectrometer
2. Vibratory Polishing Vibromet 2 Set-up
3. ECOMET 250 Grinder Polisher Set-up
4. 12 kW-80kV Electron Beam Welding Setup

### ***Lectures by Visiting Experts***

1. Magnesium from structural materials to next-generation energy storage devices *by* Dr. Partha Saha (Swanson School of Engineering, University of Pittsburgh 819 Benedum Hall, 3700 OHara Street, Pittsburgh USA 15261)
2. Structural stability, properties and processing of high performance materials *by* Dr. Soumyadip Maiti (Swiss Federal Institute of Technology (ETH) Zurich, Bergacker 74, Zurich, CH -8046, Switzerland)
3. Modeling the mechanical behavior and deformed microstructure of irradiated bcc materials using continuum crystal plasticity *by* Dr. Anirban Patra (School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, GA 30332, USA)

### ***Doctoral and MS Degrees Awarded***

1. Suparna Roy : Effect of microalloy precipitates on austenite grain growth during reheating treatment of HSLA steel.(Ph.D.)



2. Swapan Kr. Karak : Development of Nano-oxide Dispersed Ferritic Alloys by Mechano-Chemical synthesis and Advanced Consolidation Technique(Ph.D.)
3. Soumitra Chakraborty : Effect of annealing on texture evolution and oxide formation in nanocrystalline nickel-Iron alloys(Ph.D.)
4. Snehanshu Pal : Atomistic Simulations of Methane Hydrates and Inhibitor Design(Ph.D.)
5. Anway Maiti : Synthesis of MWCNT Reinforced Al-Si Nanocomposites by Microwave Sintering and Spark Plasma Sintering(Ph.D.)
6. Suresh Telu : High Temperature Oxidation behavior of Tungsten based Materials Processed by Powder Metallurgical Route(Ph.D.)
7. Mukesh Kumar Sharma : Study of reduction behaviour of Prefabricated Iron Ore Graphite/Coal Composite pellets in Rotary Hearth Furnace(MS)
8. Siddhartha Tiwari : Effect of Cu and Ni on the Fracture Toughness of As-Cast Ductile Iron(MS)

### ***Member - Professional Bodies***

1. Dutta Majumdar, Jyotsna, *Life Member* - National Academy of Science, Allahabad
2. Mitra, Rahul, *Life Member* - Indian Institute of Metals
3. Mitra, Rahul, *Life Member* - Indian Ceramic Society
4. Mitra, Rahul, *Life Member* - Materials Research Society of India
5. Mitra, Rahul, *Member* - Programme Advisory Committee on Minerals, Metals and Materials, Department of Science and Technology
6. Kundu, Tarun Kumar, *Member* - The Minerals, Metals & Materials Society
7. Kundu, Tarun Kumar, *regular* - Indian Institute of Metal
8. Biswas, Koushik, *Life Member* - The India Science Congress Association
9. Biswas, Koushik, *Member* - The Mineral Metal and Material Society, USA
10. Biswas, Koushik, *Life Member* - The Indian Institute of Metals
11. Biswas, Koushik, *Life Member* - Materials Research Society of India (MRSI)
12. Biswas, Koushik, *Life Member* - The Indian Ceramic Society
13. Aich, Shampa, *Life Member* - Indian Institute of Metals
14. Aich, Shampa, *Regular* - Institute of Biological Engineers (IBE)
15. Aich, Shampa, *Regular* - Materials Research Society (MRS), USA
16. Aich, Shampa, *Regular* - The Minerals, Metals & Materials Society (TMS), USA
17. Sant, Sudhindra B, *Member* - American Society of Metals
18. Sant, Sudhindra B, *Member* - The Materials Society
19. Chakrabarti, D, *Life Member* - Indian Institute of Metals
20. Chakrabarti, D, *Member* - Institute of Minerals, Materials and Mining (IOM3)
21. Laha, Tapas, *Life Membership* - The Indian Institute of Metals (IIM)
22. Laha, Tapas, *Life Membership* - The Indian Science Congress Association (ISCA)
23. Laha, Tapas, *Professional Membership* - The Materials Research Society (MRS)
24. Laha, Tapas, *Professional Membership* - The Minerals Metals & Materials Society (TMS)
25. Kar, Sujoy Kumar, *Member* - Indian Institute of Metals
26. Kar, Sujoy Kumar, *Committee member of two different technical groups of* - The Minerals, Metals & Materials Society (TMS)
27. Kar, Sujoy Kumar, *Member* - Alpha Sigma Mu (the International Professional Honour Society for Materials Science & Engineering)
28. Kar, Sujoy Kumar, *Member* - ASM International
29. Das, Jayanta, *Member* - Deutsche Gesellschaft für Materialkunde e.V. (German Society for Materials Research)
30. Das, Jayanta, *Life Member* - The Indian Institute of Metals
31. Chakraborty, Madhusudan, *Life Member* - Materials Research Society of India
32. Chakraborty, Madhusudan, *Member* - Institute of Indian Foundrymen
33. Chakraborty, Madhusudan, *Life Member* - Indian Institute of Metals

34. Roy, Gour Gopal, *Life Member* - Indian Institute of Metals
35. Das, Siddhartha, *Life Member* - Indian Institute of Metals
36. Das, Siddhartha, *Life Member* - Materials Research Society of India
37. Das, Siddhartha, *Life Member* - Powder Metallurgy Association of India
38. Das, Siddhartha, *Life Member* - Tau Beta Pi, a national engineering honour society, USA
39. Das, Siddhartha, *Life Member* - Sigma Xi, a national scientific research society, USA
40. Das, Karabi, *Life member* - Indian Institute of Metals
41. Das, Karabi, *Life member* - Materials research society, India
42. Ghosh, R N, *Life Member* - Indian institute of Metals
43. Ghosh, R N, *Life Member* - Indian Society for Non Destructive Testing (ISNT)
44. Ghosh, R N, *Life Member* - Indian Institute of Welding
45. Roy, Sanat Kumar, *Regular Member* - The Mining, Geological and Metallurgical Institute of India
46. Roy, Sanat Kumar, *Regular Member* - Corrosion Society of India
47. Roy, Sanat Kumar, *Life Member* - Materials Research Society of India
48. Roy, Sanat Kumar, *Life Member* - The Indian Institute of Mineral Engineers
49. Ray, Kalyan Kumar, *Life member* - Indian group of International Stereological Society
50. Ray, Kalyan Kumar, *Fellow* - Indian Institute of Metals
51. Ray, Kalyan Kumar, *Life Member* - Material Research Society of India
52. Ray, Kalyan Kumar, *Life Member* - Powder Metallurgical Association of India
53. Pabi, Shyamal Kumar, *Lifemember* - Indian Institute of Metals
54. Pabi, Shyamal Kumar, *Life member* - Materials Research Society of India
55. Pabi, Shyamal Kumar, *Member and former Sectional President of Metal Science Section* - Indian Science Congress Association
56. Sen, Prodip Kumar, *Life Member* - Indian Institute of Metals

#### ***Member - Editorial Board***

1. Chakraborti, Nirupam (0) *Member Editorial Board* - Journal of Advanced Research in Evolutionary Algorithms
2. Chakraborti, Nirupam (0) *Member Editorial Board* - Materials & Manufacturing Processes
3. Chakraborti, Nirupam (0) *Member Editorial Board* - International Journal of Machining and Machinability of Materials
4. Chakraborty, Madhusudan (2000) *Member* - Indian Foundry Journal
5. Dutta Majumdar, Jyotsna (2010) *Chief Editor* - Advances in Metallic Materials Processing a special issue under Advanced Processing of Materials
6. Dutta Majumdar, Jyotsna (2010) *Member, Editorial Board* - Lasers in Engineering
7. Dutta Majumdar, Jyotsna (2009) *Editorial Board Member* - International Journal of Emerging Technologies and Applications in Engineering
8. Ghosh, Sudipto (2012) *Associate Editor* - Journal of Surfaces and Interfaces in Materials
9. Mitra, Rahul (2010) *Member* - Transactions of the Indian Institute of Metals
10. Pabi, Shyamal Kumar (2012) *Member* - Advances in Materials Research (AMR)
11. Pabi, Shyamal Kumar (2012) *Member* - Conference Papers in Materials Science
12. Ray, Kalyan Kumar (2007) *Advisory Member* - Transactions of the Indian Institute of Metals
13. Roy, Gour Gopal (2010) *Member of Editorial board* - Science and Technology of Welding & Joining
14. Sen, Prodip Kumar (2012) *Member, Editorial Board* - Steel Tech

#### ***Awards & Honours***

1. Mitra, Rahul (2013) *2nd prize in oral presentation in Metal Science Group of 67th Annual Technical Meeting of Indian Institute of Metals*

2. Das, Siddhartha (2014) “*SANKARSAN JENA MEMORIAL AWARD received from The Institute of Engineers (India) for the paper entitled Innovative Processing of ODS Ferritic Steel For Nuclear Reactor Applications*”
3. Dutta Majumdar, Jyotsna (2013) *Friedrich Wilhelm Bessel Research Award*
4. Das, Jayanta (2012) *IEI Young Engineers Award 2011-2012, Institution of Engineers (India)*

### ***Sponsored Research Projects***

1. Atomistic Simulation of Gas Hydrates and Stabilizer/Inhibitor Design (MINISTRY OF EARTH SCIENCES, Rs.31.92 Lakhs)
2. Carbon Abatement In Ironmaking Blast Furnace (Ministry of Steel, Rs.0.00 Lakhs)
3. CO<sub>2</sub> abatement in iron and steel production by process optimization (Ministry of Steel, Govt. of India, Rs.84.36 Lakhs)
4. Comparative Study of the Isothermal/Cyclic Oxidation Behavior of Molybdenum Silicide Based Alloys and Composites in Wet and Dry Air and Effect of prior (DRDO, Rs.33.89 Lakhs)
5. Correlation between Processing, Microstructure, Microtexture & Property in a beta Titanium alloy Ti-5553 (IIT Kharagpur (ISIRD Project), Rs.5.00 Lakhs)
6. Development of Aluminium Cenosphere Syntactic Foam Through Spray Forming Technique for Aerospace Application (Aeronautics Research and Development Board (ARDB), N. Delhi, Rs.0.00 Lakhs)
7. Development of Bulk Aluminum Nitride (SSPL-DRDO CARS project, Rs.24.33 Lakhs)
8. Development of Compositionally Modulated Thermal Barrier Coating by Hybrid Technologies (Project Code: DTH) (Kalpana Chawla Space Technology Centre, Rs.15.00 Lakhs)
9. Development of ductile cast iron for spent fuel sub-assembly cask for PFBR (IGCAR, Kalpakkam, Rs.32.68 Lakhs)
10. Development of Duplex Stainless Steel, (Shyam Ferro Alloys Limited,, Rs.0.00 Lakhs)
11. Development of Expert System for Indian Blast furnace (Ministry of Steel, Rs.84.46 Lakhs)
12. Development of Functionally Graded Metallic Components by Laser Materials Processing for Bio-implant Application (Department of Science and Technology, N. Delhi-National Science Foundation, South Africa, Rs.9.00 Lakhs)
13. Development of High Strength to Weight Ratio Materials for the Body of Under Water Vehicle (National Institute of Ocean Technology, Rs.76.02 Lakhs)
14. Development of low carbon steels for hot forged automotive components, (I-DESIGN Engineering Solutions Ltd. (a Subsidiary of RSB Transmissions (I) Ltd.),, Rs.0.00 Lakhs)
15. Development of Molybdenum and Niobium silicide based alloys and composites for elevated temperature applications (Defence Research and Development Organization, Rs.32.41 Lakhs)
16. Development of piezoelectric thin films as high-frequency resonators and filters (ISRO-KCSC, Rs.5.00 Lakhs)
17. Development of Porous Bio-active Ti-based Composite for Bio-implant Application (Department of Biotechnology, Rs.30.00 Lakhs)
18. Development of shape memory magnetocaloric alloys for magnetic cooling and other applications: A nonconventional source of energy (SGBSI Grant, SRIC, IIT Kharagpur, Rs.100.00 Lakhs)
19. Effect of ferrite grain structure on the mechanical properties of low-carbon steel (CSIR, New Delhi, Rs.20.00 Lakhs)
20. Essar Steel Research Wing (Essar Steel Limited, Rs.25.00 Lakhs)
21. Establishment of an advanced research facility for EB welding and process development related to programs of interest to DAE (EBW) (BRNS, DAE, Mumbai, Rs.132.00 Lakhs)
22. Evaluation of Manganese nodules Extraction Processes: A new Approach, Phase II (Ministry of Earth Sciences, through IMMT, Bhubaneswar, Rs.15.12 Lakhs)
23. Experimental Evaluation on FLD and forming behavior of differently heat treated IN718 material (ISRO, Rs.28.00 Lakhs)

24. Feasibility of sequestration of carbon di-oxide from industrial systems-Phase I (National Institute of Ocean Technology, Chennai, Rs.12.36 Lakhs)
25. FIST Program - 2012 [129] (FHH) (Department of Science and Technology (DST), Government of India, Rs.245.00 Lakhs)
26. Life estimation and microstructural damage of irradiated and unirradiated Cu-Cr-Zr alloy (NFP-BRFST, Ahmedabad, Rs.30.38 Lakhs)
27. Mathematical Model Development for Induration Cycle of Different Ore Sources (Ministry of Steel, GoI, Rs.89.42 Lakhs)
28. Mathematical modeling of reduction kinetics of iron ore coal composite pellets (Ministry of Steel, Rs.55.00 Lakhs)
29. MD-Stochastic Model-based Design, Synthesis and Thermo-Physical Characterization of Nanofluids for Advanced Heat Transfer Applications (Naval Research Board, DRDO, Rs.48.40 Lakhs)
30. Microstructural Characterization and its Optimization for Improved Weld Strength, Fatigue Behavior and Corrosion Resistance of Electron Beam Welded Ma (Board of Research on Nuclear Science, Rs.22.00 Lakhs)
31. Microstructural evaluation and structure-property correlations for nickel, titanium, and iron based alloy systems (GE India Technology Centre Pvt. Ltd., Rs.9.00 Lakhs)
32. Microstructure-Texture-Toughness relations in High Strength Automotive Steel. (Funded by: DST, New Delhi. (HAS), Rs.28.00 Lakhs)
33. MICROWAVE ASSISTED SYNTHESIS OF NANOCRYSTALLINE ELECTRO-CERAMICS FOR FERRO-ELECTRIC RELAXORS AND SOFCS (CSIR, New Delhi, Rs.21.98 Lakhs)
34. Multiwalled Carbon Nanotube Reinforced Al Alloy Based Bulk Nanocomposites via Spark Plasma Sintering (DST, India, Rs.25.00 Lakhs)
35. Nanocrystalline Plasticity (DST, Rs.15.00 Lakhs)
36. Optimization of design & operating parameters like wire speed, bath super heat, steel grades on calcium recovery and its efficacy (Rastriya Ispat Nigam Limited, Rs.6.45 Lakhs)
37. Optimization of Processing Parameters to Produce High Aspect Ratio Synthetic Wollastonite (Indian Rare Earths Ltd., Kerala, Rs.38.32 Lakhs)
38. Picometer displacements in piezoelectric thin film membranes for resonators (DST, Indo-Portuguese Joint Research project, Rs.3.70 Lakhs)
39. Process induced microstructural variation towards improved ductile-brittle transition temperature (DBTT) of 9Cr-1Mo steel (BRNS, Department of Atomic Energy (DAE), Rs.21.00 Lakhs)
40. Processing and characterization of bulk nanostructured brass (Department of Science and Technology, SERC, Rs.18.06 Lakhs)
41. Processing, characterization and deformation behavior of Ti-Fe-(Sn) ultrafine eutectic composites (ISIRD, SRIC, I.I.T. Kharagpur, Rs.5.00 Lakhs)
42. Solvent Extarction using Ionic Liquids for High Value Metal (IIT, Rs.4.70 Lakhs)
43. Structural Characterization of Materials Lab (MHRD, New Delhi, Rs.495.00 Lakhs)
44. Structure-property relations in ceramic composites for high temperature applications in nose cone tiles in hypersonic vehicles (Defence Research and Development Organization, Rs.72.96 Lakhs)
45. Studies on process optimisation and visualisation of laser cladding process (BRNS-DAE, Rs.18.00 Lakhs)
46. Studies on the deformation mechanism and evolution of plasticity in nano/-ultrafine lamellar composites (SGIRG Grant, SRIC, IIT Kharagpur, Rs.25.00 Lakhs)
47. Study of correlation between Processing , Microstructure , Microtexture and Property in a high strength, beta Titanium alloy Ti-5Al-5Mo-5V-3Cr (DRDO, Rs.40.00 Lakhs)
48. Study on the effect of heat-treatment on microstructures and properties of SUP9 and SUP11A steels (Soni Auto & Allied Industries Ltd., Kolkata - 700 001, Rs.5.16 Lakhs)
49. Synthesis and characterization of molybdenum disilicide heating element (Naskar and Company, Howrah - 711 103, Rs.0.00 Lakhs)

50. Synthesis of Al-based BMG Composite with Improved Ductility via Mechanical Alloying and SPS (DST, India, Rs.43.00 Lakhs)
51. Synthesis of Al-MWCNT nanocomposite (ISIRD, IIT Kharagpur, Rs.5.00 Lakhs)
52. Thermomechanically processed high strength bainitic steel rails for Indian Railways, (RDSO, Ministry of Railways, ,, Rs.0.00 Lakhs)
53. Ti/TiB<sub>2</sub> Bi-layered and Multi-layered Coating on Steel Substrate by Pulsed Laser Deposition (PLD) Technique to Improve Tribological Properties (CSIR, Rs.19.25 Lakhs)
54. Understanding the Effect of Crystalline Reinforcement in Al-based BMGNCs towards Improving Ductility and Fracture Toughness (SGIRG Grant, SRIC, IIT Kharagpur, Rs.25.00 Lakhs)

### ***Consultancy Projects***

1. Artificial Neural Network Modeling of Materials (GE India Technology Center Pvt. Ltd., Rs.2.50 Lakhs)
2. Charpy impact testing of TMT rebar (Tata Steel, Jamshedpur, Rs.10.00 Lakhs)
3. Comparative study between V and Nb microalloyed steels from Tata Steel in terms of precipitation strengthening (Tata Steel, Rs.26.90 Lakhs)
4. Comparative study between V- and Nb-microalloyed steels and optimizing the processing parameters for those grades (Tata Steel Jamshedpur, Rs.25.00 Lakhs)
5. Consultancy project on extractive metallurgy of polymetallic nodules (Ministry of Earth Science, New Delhi, Rs.40.53 Lakhs)
6. Corrosion resistance test of Reinforcement of Existing Major Bridge on Kanchnalla and River Bhargavi (CREB) (M/s Bhubaneswar Expressway Pvt. Ltd., N. Delhi – 110001, Rs.0.00 Lakhs)
7. Creep modelling of high temperature alloys for super critical applications (CHAC) (BHEL R&D, Hyderabad, Rs.6.00 Lakhs)
8. Development in process design to achieve improved structural integrity of gun barrel (Metal & Steel Factory, Ishapore, Rs.24.27 Lakhs)
9. Development of air cooled microalloyed steel with improved toughness for forging applications (Ashok Leyland, Rs.12.00 Lakhs)
10. Examination of cold rolled stainless steel samples (Salem Steel Plant, Rs.0.67 Lakhs)
11. Genetic Algorithms in Blast Furnace (Åbo Akademi University, Finland, Rs.0.00 Lakhs)
12. Improvement of Adhesion between Bead Wire and Rubber Material inside Radial Tires (Tata Steel, Rs.0.00 Lakhs)
13. Investigation on causes of Crack formation in cast Pb-5% Sb alloy spine and possible solutions. (Exide Industries Ltd, Durgachak, Haldia -721602., Rs.5.84 Lakhs)
14. Optimizing the properties of galvanized steel (TATA Steel, Rs.0.00 Lakhs)
15. Process Optimization of Polymetallic Nodules (Consulting for Extractive Metallurgy) (Ministry of Earth Sciences, Rs.0.00 Lakhs)
16. SEM and TEM Examination of Cold Rolled Stainless steels (Salem Steel Plant, Tamil Nadu, Rs.1.00 Lakhs)
17. Strength and fracture behaviour of spot-welds in automotive steel sheets (Tata Steel, Rs.17.83 Lakhs)
18. Stress relaxation behavior of steel reinforcing strands (SRBS) (Tata Steel Limited, Rs.11.00 Lakhs)
19. Study of structure-property relations of wire ropes for achieving improved service performance (Usha Martin Ltd., Rs.19.05 Lakhs)

### ***Patents (filed / granted)***

1. A hot-rolled high strength micro-alloyed steel with YS/UTS ratio less than 0.8 for automotive applications
2. An electrolyte bath composition for whisker resistant tin plating on bath substrate

3. Oxide dispersion strengthened powder metallurgy ferritic alloy and process for producing the same.
4. Synthesis of Bulk nanocomposites by non contact cavitation method

#### Visits Abroad by Faculty Members

1. Chakrabarti, D - Attending International Conference, Thermec-2013 (Las Vegas, USA, ) 1-8 December, 2013
2. Laha, Tapas - Attending Thermec 2013 (Las Vegas, USA, ) 30th Nov to 6th Dec 2013
3. Dutta Majumdar, Jyotsna - As an external expert to conduct Phd viva Voce examination (Malta, ) 4 days
4. Dutta Majumdar, Jyotsna - Discussion on collaborative research (Germany, ) 3 days
5. Dutta Majumdar, Jyotsna - To attend the International conference on Lasers in Manufacturing (Germany, ) 7 days
6. Dutta Majumdar, Jyotsna - to attend the Spring Meeting of European Materials Research Society (EMRS) and Present Paper (France, ) 6 days
7. Sant, Sudhindra B - Invited talk at MS&T13 (Montreal, Canada, ) Oct 28-31, 2013
8. Sant, Sudhindra B - Invited talk (Queens University, Canada, ) Nov 1, 2013
9. Kar, Sujoy Kumar - Research Collaboration (University of North Texas, ) 1 week
10. Singh, Shiv Brat - collorative work and symposium (Cambridge, ) 4 days in July 2013
11. Singh, Shiv Brat - Thermec 2013 conference (USA, ) December 4-6 2013

#### Invited Lectures by Faculty Members

1. Microstructural design of piezoelectric ZnO thin films as high frequency resonators. *by* Sant, Sudhindra B (Queens University, Canada)
2. Microstructural Design and Nature of Chemical Species for biological efficacy of novel antimicrob *by* Sant, Sudhindra B (MST13, Montreal, Canada)
3. Mechanical Properties and Oxidation Behavior of Ultra-High Temperature Structural Materials *by* Mitra, Rahul (IIT Kanpur)
4. Mechanical Behavior and Oxidation Resistance of Ultra-High Temperature Structural Materials *by* Mitra, Rahul (IIT-BHU Varanasi (67th Annual Technical Meeting))
5. Interfaces in ZrB<sub>2</sub>-SiC Composites *by* Mitra, Rahul (Kolkata - EMSI Conference)
6. Synthesis of Physically Functionalized CNT Reinforced Al-Si Nanocomposite by SPS *by* Laha, Tapas (Las Vegas, USA)
7. 2. Mechanical and Electro-chemical Properties of Laser Surface Alloyed AISI 304 Stainless Steel with *by* Dutta Majumdar, Jyotsna (Munich, Germany)
8. Laser Surface Engineering for Tribological Application *by* Dutta Majumdar, Jyotsna (AMPRI, Bhopal)
9. 9. Laser Surface Texturing of Ti-6Al-4V for Bio-implant Application *by* Dutta Majumdar, Jyotsna (Karlsruhe Institute of Technology, Germany)
10. Laser Composite Surfacing for Improved Wear Resistance *by* Dutta Majumdar, Jyotsna (University of Malta, Malta)
11. Role of Sn in Improving the Adhesion between Cu-Sn Alloy Coated Steel and SBR Based Rubber *by* Laha, Tapas (Thermec 2013, Las Vegas, USA)
12. Cored wire injection in steel melt *by* Roy, Gour Gopal (IT BHU, Vanarasi)
13. Evolution of RHF as chemical beneficiator for liquid iron production from iron ore coal composite *by* Roy, Gour Gopal (IIMT Bhubaneswar)
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15. Development of metallurgical structures during rolling and annealing of Copper *by* Chakrabarti, D (International Wrought Copper Council, Technical Seminar, Trident Hotel, Mumbai)

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33. Fracture behaviour of Nb-Si-Ti alloy, By Poulami Maji, R. Mitra and K. K. Ray, *National Conference on processing and characterization of materials*, NIT, Rourkela, India, (2012)
34. Fracture toughness of high entropy alloys, By U. Roy, H. Roy, H. M. Daoud, U. Glatzel and K. K. Ray, *66th Annual Technical Meeting of the Indian Institute of Metals*, Jamshedpur, Jharkhand, India, (2012)
35. Green Synthesis of a core-shell ZnO Nanostructure with a Graphene like Surface Layer at Low Temperature., By Sumit Kumar, S. Ram, R. Mitra, and S. K. Roy, *Presented at the 100th Indian Science Congress at Calcutta University*, Kolkata, (2013)
36. High energy milling of boehmite: changes in particulate characteristics., By T.C.Alex, Rakesh Kumar, S. K. Roy, and S.P.Mehrotra., *Presented at the International Seminar on Mineral Processing Technology*, Bhubaneswar, (2013)
37. Interfaces in ZrB<sub>2</sub>-SiC Composites, By R. Mitra, M. Mallik, S. Chakraborty, K.K. Ray, *International Conference on Electron Microscopy, & 34th Annual Meeting of Electron Microscopy Society of India*, Hyatt Hotel, Kolkata, (2013)
38. MD-Stochastic model based design, synthesis and thermo-physical characterization of nanofluids for advanced heat transfer applications, By S K Pabi, M M Ghosh, V Kartik and S Ghosh, *National Conference on Ocean Technology*, Chennai, (2013)
39. Mechanical and Electro-chemical Properties of Laser Surface Alloyed AISI 304 Stainless Steel with WC+Ni+NiCr (invited lecture), By J. Dutta Majumdar, *Lasers in Manufacturing - 2013*, Munich, Germany, (2013)
40. Mechanical Behavior and Oxidation Resistance of Ultra-High Temperature Structural Materials, By R. Mitra, *67th Annual Technical Meeting of the Indian Institute of Metals*, IIT-BHU, Varanasi, (2013)
41. Microstructural design of piezoelectric ZnO thin films as high frequency resonators, By P. Abhinav, B. M. Skaria, B. Pramanick, K. Sreenivas and S. B. Sant, *MS&T13*, Montreal, (2013)
42. Microstructure - Its effect of fracture toughness and tensile properties of Ti-5553 alloy, By Sujoy Kar, Swati Suman, Amit Bhattacharjee, Dipankar Banerjee, *TMS 2014*, San Diego, CA, USA, (2014)
43. Microstructure, Fracture Toughness and Tensile Properties for Ti-5Al-5V-5Mo-3Cr alloy, By Sujoy Kumar Kar, Swati Suman, Atasi Ghosh, Amit Bhattacharjee, Dipankar Banerjee, *NMD ATM 2013*, Varanasi, India, (2013)
44. Monotonic Stress-Strain Model for R-104, By Sujoy Kumar Kar, *Komplastech 2013*, Zakapone, Poland, Europe, (2013)
45. Non-isothermal and isothermal oxidation behaviour of CoNiCrAlY/YSZ thermal barrier coating, By S. Nath, I. Manna and J. Dutta Majumdar, *Annual Technical Meeting of the Indian Institute of Metals, 2013*, IIT BHU, (2013)

46. Oxide Dispersion Strengthened Powder Metallurgy Ferritic Alloy, By 1. K. Jayasankar, Abhishek Pandey, B. K. Mishra, and Siddhartha Das, *International Conference & Exhibition on Powder metallurgy, PM-2013*, Pune, India, (2013)
47. Phase stability of lanthanum gallate based electrolyte material by multiple doping, By Ramesh Chandra Biswal and Koushik Biswas, *51th National Metallurgists Day And 67th Annual Technical Meeting Of The Indian Institute Of Metals*, BHU, Varanasi, (2013)
48. Preparation and structural investigations of ODS ferritic steel, By K. Jayasankar, B. K. Mishra, and Siddhartha Das, *6th German-Japanese International Symposium on Nanostructures*, Kusatsu/ Kyoto, Japan, (2013)
49. Probabilistic analysis of fracture toughness of AISI 4335 steel, By R. N. Jha and K. K. Ray, *66th Annual Technical Meeting of the Indian Institute of Metals*, Jamshedpur, Jharkhand, India, (2012)
50. Process models for iron ore-coal composite pellets at RHF, By Vandana Kumari, P. K. Sen and G. G. Roy, *STIS-2013*, NML, Jamshedpur, (2013)
51. Rare earth hexaaluminate and yttrium aluminium garnet composites for advance thermal barrier coatings, By P Jana, P S Jayan, S Mandal and K Biswas, *International conference on advanced functional materials 2014 (ICAFM 2014)*, NIIST Trivandrum, India, (2014)
52. Recrystallization and austenite grain coarsening behavior during processing of microalloyed high strength steels for line pipe applications, By Debalay Chakrabarti, *Present & Future Trends in Auto & Line Pipe Steels*, RDCIS Auditorium, RDCIS Ranchi, (2013)
53. Role of Sn in binary alloy coating on steel for bead rubber and steel adhesion in radial tyre, By A. Banerjee, R. Kumar, M. Dutta, Tapas Laha, *NMD 2013*, IIT BHU, Varanasi, (2013)
54. Role of Sn on the Adhesion between Cu-Sn Alloy Coated Steel and SBR Based Rubber, By A. Banerjee, T. Laha, *Thermec 2013*, Las Vegas, USA, (2013)
55. Simulation of pearlitic microstructure using multi-phase field modelling, By J Venkatesan , Sujoy Kumar Kar, *NMD ATM 2013*, Varanasi, India, (2013)
56. Size effect and hall–petch interaction during indentation in Ti-Fe-(Sn) ultra- fine eutectic alloys, By T. Maity, J. Das, *The 51th National Metallurgist Day (NMD) and the 67th Annual Technical Meeting (ATM) of Indian Institute of Metals*, IIT (BHU) Varanasi, India, (2013)
57. Some aspects of electron beam welding of copper to AISI-304 stainless steel., By Jyotirmaya Kar, G.G.Roy and S.K.Roy, *Presented at the 67th ATM of IIM at.*, Varanasi, (2013)
58. Sponge iron production in tunnel kiln using iron ore-coal composite pellets, By S. C. Khattoi and G. G. Roy, *STIS-2013*, NML, Jamshedpur, (2013)
59. Structure-Property Correlation of Laser Surface Engineered AISI H13 Hot Work Tool Steel for Improved Mechanical Properties, By G. Telasang, J. Dutta Majumdar, N. Wasekar, G. Padmanabham, and I. Manna, *Annual Technical Meeting of the Indian Institute of Metals, 2013*, IIT BHU, (2013)
60. Studies on Ytria stabilized zirconia coating developed by pulsed laser deposition, By 11. Subhasisa Nath, Indranil Manna, Samit Kumar Ray, Pardha Sarathy Raghavarapu, Jyotsna Dutta Majumdar, *DAE-BRNS 7th National Symposium on Pulsed Laser Deposition of Thin Films and Nanostructured Materials*, Indian Institute of Technology Kharagpur, (2013)
61. Study of multiple doping in LaGaO<sub>3</sub> for SOFC electrolyte application, By Ramesh C. Biswasl and Koushik Biswas, *International conference on frontiers in energy, environment, health and materials research*, Bhubaneshwar, (2013)
62. Synthesis and characterization of perovskite type anode material for IT-SOFC application, By Ramesh Chandra Biswal, Subhajit Pan, Himani Thakur and Koushik Biswas, *51th National Metallurgists Day And 67th Annual Technical Meeting Of The Indian Institute Of Metals*, BHU, Varanasi, (2013)
63. Synthesis and characterization of sol gel derived meso-porous lanthanum magnesium hexaaluminate powder for various functional applications, By P Jana, P S Jayan, S Mandal and K Biswas, *International conference on functional materials 2014 (ICFM 2014)*, IIT Kharagpur, (2014)

64. Synthesis and property study of multi-doped LaGaO<sub>3</sub> for SOFC application, By Ramesh C. Biswas and Koushik Biswas, *4th International Conference on Mechanical and Manufacturing Engineering (ICME 2013)*, Putrajaya, Malaysia, (2013)
65. Synthesis and thermal analysis of core core-shell ZnO nanostructure with a graphene like surface layer., By Sumit Kumar, S. Ram, S. K. Roy and R. Mitra, *Presented at the International Conference on Recent Advances in Composite Materials (ICRACM-2013)*, Goa, (2013)
66. Synthesis of Physically Functionalized Carbon Nanotube Reinforced Al-Si Nanocomposite by Spark Plasma Sintering, By A. Maiti, R.S. Maurya, T. Laha, *Thermec 2013*, Las Vegas, USA, (2013)
67. Synthesis, characterization and mechanical activation of hydrothermally prepared boehmite., By T. Barol, T.C.Alex and S.K.Roy, *Presented at the 67th ATM of IIM.*, Varanasi, (2013)
68. Thermal treatment-Microstructure-Fracture Toughness correlation in Ti-5553 (Ti-5Al-5Mo-5V-3Cr) alloy for aircraft structural applications, By Atasi Ghosh, S.Shivaprasad, Sujoy Kar, Amit Bhattacharjee and Dipankar Banerjee, *TMS Fall Meeting 2012*, Orlando, Florida, USA, (2012)
69. Transmission Electron Microscopy of II-VI compound semiconductor thin films, By S. B. Sant, *Annual meeting of the Electron Microscopy Society of India*, Kolkata, (2013)
70. USE OF PROCESS MODELS TO ESTIMATE CO<sub>2</sub> EMISSION REDUCTION FOR TOP GAS RECYCLE FURNACE WITH INDIAN RAW MATERIALS, By R.K.Sahu,G.G.Roy and P.K.Sen, *International Conference on Science and Technology of Ironmaking and Steelmaking*, CSIR(NML),Jamshedpur, India, (2013)
71. Use of Top Gas Recycle Blast Furnace For Decreasing Co<sub>2</sub> Emissions: The Effect on Sequestration and Downstream Energy, By , *IIM-NMD-2013*, Varanasi, (2013)

## Department of Mining Engineering

### **Head**

Prof. Karanam Uma Maheshwar Rao

### **Professors**

Bhattacharya, Jayanta	<i>Ph.D.(IIT Kharagpur)</i> , Environmental Engineering and Management Social Impacts Mine Planning and Reliability Engineering
Bhattacharjee, Ashis	<i>Ph.D.(Penn-State)</i> , Occupational Health and Safety and Operations Research applications in mining
Das, Samir Kumar	<i>Ph.D.(ISM Dhanbad)</i> , Strata Control and Rock Mechanics, Mines Safety Engineering, Mine Environment
Deb, Debasis	<i>Ph.D.(Alabama Univ, USA)</i> , Rock Mechanics, Numerical modelling, Mine Design, Ground Control
Mukhopadhyay, Subir Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Mine Planning and Design, Underground Metalliferous Mining, Surface Mining (Open pit/ Opencast/ Quarry/ On & Offshore Placer), Mine Safety Mining Laws and Mine Management, Mine and Mineral Economics Valuation Trade & Stockpiling, Small-scale Mining and Sustainable Development in Mining
Pal, Samir Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Geomechanics - Roof fall prediction in underground coal mines, Mine Void Filling – Blind backfilling of abandoned mines using sand and other waste material, Wear of Elastomers in Mining – Abrasion of elastomers against different rock types.
Pathak, Khanindra	<i>Ph.D.(London Univ)</i> , Environmental Management in Surface Mining, Safety and Productivity of Mining Machinery, Application of Remote Sensing and GIS, Vetiver System Implementation for CSR- EMP Integration, Oil Spill Management
Rao, Karanam Uma Maheshwar	<i>Ph.D.(IIT Kharagpur)</i> , Rock Mechanics, Mine Development, Underground Metal Mining, Back filling of mine voids
Sastry, Bhamidipati Suryan	<i>Ph.D.(Utah)</i> ,

### **Associate Professors**

Chakravarty, Debashish	<i>Ph.D (IIT Kharagpur)</i> , Mine Mapping and Locational Surveillance using Digital Photogrammetry, GeoResource Exploitation using Geoinformatics and GPS & GIS, Mineral Resource Mapping using Geodesy and InSAR Technologies, Geotechnical Stability Analysis of Slopes using Numerical Modelling, Hyperspectral Imaging for Mineral Identification
Majumder, Arun Kumar	<i>Ph.D.(Univ. of Queensland)</i> , Mineral Processing, Coal Washing, Solid-Fluid Interactions, Fine Particle Processing
Samanta, Biswajit	<i>Ph.D.(IIT Kharagpur)</i> , Mine planning, Geostatistics, Mine environment and ventilation

### **Assistant Professors**

Dey, Kaushik	<i>Ph.D.(ISM, Dhanbad)</i> , Rock excavation blasting mechanised rock
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	cutting surface mining
Patra, Aditya Kumar	<i>Ph.D.(Imperial College, London)</i> , Air pollution measurement and modelling, Greenhouse gas emissions from mines, Human vibration in mines and allied industries, Industrial safety assessment and audit
Prusty, Basanta Kumar	<i>Ph.D.(Southern Illinois)</i> , Coalbed methane and shale gas, Geological Carbon Sequestration, Underground Coal Gasification
Verma, Abhiram Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Rock Mechanics and Ground Control, Slope Design, Numerical Modeling, Rock Fracture Mechanics

### ***Faculty Re-employment***

S K Mukhopadhyay                      Visiting Professor

### ***Brief Description of on-going activities***

Environment and Safety- Application of LCA, GIS and remote sensing for soil and water analysis as a part of mine closure planning; Experimental and computational fluid dynamics studies for shock loss determination in mine air flow; Biological and passive treatment of mine waste water; Investigation of soil and water contamination vis-à-vis land use changes near mining fields. Study of human behaviour related accidents in mines; Epidemiological investigations to identify possible risk factor of occupational injuries in mines; The statistical methods for assessing risk factors included logistical regression, loglinear modeling and structural equation modeling.

Rock Mechanics / Ground Control- Finite element analysis for longwall strata control problems, and design of shield supports; Rock Joints and their influence on the stability of underground openings; Rock Mass characterization, Land reclamation and soil mechanics; Assessment of Fly ash composites as a substitute fill material for underground mine voids; Risk analysis for the safety management of coalmines; On the mechanics of rock fragmentation by drilling and cutting- studies on the linear cutting machine (LCM).

Mine Planning / Modeling- Application of various grade estimation techniques namely kriging, cokriging, stichastic simulation and neural networks for estimation of mining blocks for quality control in mines; Investigation of different statistical quality control techniques including univariate and multivariate control charts for controlling the grade of mineral at various locations; Grade control aspects in limestone and bauxite operations. Fault Tree Analyses and algorithm development for a Coal Handling Plant.

Advanced Surveying & Geoinformatics: Integration of GPS & I.SAR ground deformation data over mining areas. Use of lasers for assessment of stability of dumps. Vision based semi-automatic mine navigation system.

Collaborative Research- Collaborative research is ongoing with the French National Institute of Health and Medical Research (INSERM) for conducting research on injury epidemiology. In this study, the public health prevention methods were applied to occupational injuries in mines.

### ***Thrust Areas***

1. Rock Mechanics and Ground Control
2. Surface and sub-surface Environment
3. Mine Safety and Systems Engineering
4. Advanced Surveying and Geo-informatics
5. Safety Engineering

## 6. Clean Coal Technology

### *New Acquisitions*

1. Total Kjeldahl Nitrogen Apparatus
2. Atomic Absorption Spectrophotometer (Graphite furnace)
3. Thermal gradient-differential scanning calorimetry
4. Oblique shear Equipment for shearing angle of 300, 350, 400, 450 and 500
5. Electronic lateral extensometer and compressometer (for NX size sample)
6. Rock Classification hammer (N-type)
7. Field density by Large Sand Pouring Cylinder [IS:2720, part XXVIII]
8. Pycnometer (capacity 250 gm or 500 gm or 1 kg) [IS:2720, part III]
9. Rapid moisture meter [IS:12175]
10. Dynamic cone penetration test apparatus for determination of cohesion and angle of internal friction
11. Pocket penetrometer
12. Proctor penetrometer (spring type)
13. Soil permeameter for both constant and falling head tests [IS:2720, part – 17, IS 11209]
14. Rock permeability apparatus for cylindrical specimen upto 100 mm dia and 100 mm high with high developing pressure upto 20 kg/sq. cm [IS:4348-1973]
15. Rock cutting Machine (2 H.P. motor operating on 440 volts 3 phase supply; rotates at approximately 2000 RPM.)
16. Diamond Cutting Saw 300 mm dia. (Thickness of blank 1.8 mm; Thickness of segment 2.8 mm)
17. Field CBR Test Apparatus (Capacity 100 kN; Penetration piston assembly)
18. CBR mould of 150 mm IS x 175 mm high with clamping lugs completed with extension collar and perforated base plate made of gun metal
19. Beam Mould [100 mm x 100 mm x 500 mm]
20. Portable Swelling Pressure and Heave Evaluating Apparatus
21. Universal Triaxial Cell for 38mm to 100 mm diameter soil specimen with lateral pressure upto 10.5 kg/cm<sup>2</sup>
22. Pneumatic Control Panel, 2 lines for Universal Triaxial Cell
23. Digital Direct Shear Apparatus (servo-controlled) of Shearing load 50kN; Vertical load 50kN; accommodate sample size of 300 mm x 300 mm x 150 mm and 200 mm x 200 mm x 100 mm with dedicated Computer and data acquisition card/ s/w
24. Hydrometer with Hydrometer Glass Jar
25. One constant volume mould each for 38 mm; 50 mm; 75 mm and 100 mm diameter specimen for unconfined compressive strength (UCS) test as per IS: 2720-Part 10 (1991) including spacers for compaction and removal of specimen from mould
26. GRIMM 1.108
27. Respo CO analyser
28. 2 LUX meter
29. 2 Digital barometer
30. 2 Anemometer
31. 3 point pitot tube
32. Wireless sensor network application kit
33. Self-contained compressed oxygen breathing apparatus
34. Spirometer (Hellious)
35. Triaxial whole body and hand arm vibration meter
36. Depth perception meter
37. Eye fatigue tester
38. Bicycle ergometer
39. Anthropolometer

### ***International Collaborations***

French National Institute for Health and Medical Research

Southern Illinois University Carbondale, USA

The University of Toulouse, France

Chonnam National University South Korea

Dong-A University South Korea

Imperial College London

Moscow State Mining University

University of Wollongong, Australia

### ***Lectures by Visiting Experts***

1. *by Mr Vivekananda Rai (ONGC Bokaro)*
2. *Prospecting and Production of Petroleum and Job Prospects in Oil Industry by Shri Biman Borgohain (ONGC Kolkata)*
3. *Surface mine environment by Dr Jim Flatt (The University of Adelaide, Australia)*

### ***Doctoral and MS Degrees Awarded***

1. Arup Roy : *Synthesis of nano-materials and their application in waste water treatment.(PhD)*
2. Amrendra Kumar : *Impact of pollution reduction instruments on coal based energy industries(PhD)*
3. Hemant Kumar : *Stability analysis of pillars in deep underground metal mines using finite element method(PhD)*

### ***Member - Professional Bodies***

1. Pathak, Khanindra, *Life Member* - Mining, Geology, Metallurgy Institute of India,
2. Pathak, Khanindra, *Life Member* - Acoustic Society of India
3. Pathak, Khanindra, *Life Member* - Indian Society for Technical Education
4. Pathak, Khanindra, *Life Member* - Institution of Engineers (India)
5. Pathak, Khanindra, *Member* - PNG Chamber of Mines and Petroleum
6. Deb, Debasis, *Life Member* - Indian Society of Theoretical and Applied Mechanics (ISTAM)
7. Deb, Debasis, *Life-time* - International Society of Rock Mechanics (ISRM)
8. Deb, Debasis, *Life-time* - Mining, Geology and Metallurgical Society of India (MGMI)
9. Chakravarty, Debashish, *Associate* - Associate Member of IEI
10. Chakravarty, Debashish, *Life Member* - Life Member of MGMI
11. Samanta, Biswajit, *Regular* - Institute of Engineer
12. Samanta, Biswajit, *Regular* - SME (Society of Mining Engineering, USA)
13. Samanta, Biswajit, *Regular* - MGMI
14. Prusty, Basanta Kumar, *Life Member* - Mining Engineers Association of India
15. Prusty, Basanta Kumar, *Life Member* - Mining Geological and Metallurgical Institute of India
16. Prusty, Basanta Kumar, *Member* - Institution of Engineers
17. Prusty, Basanta Kumar, *Member* - Society of Petroleum Engineers, USA

18. Prusty, Basanta Kumar, *Life Member* - Society of Geoscientist and Allied Technologists, India
19. Prusty, Basanta Kumar, *Life Member* - Indian Science Congress Association
20. Patra, Aditya Kumar, *Life member* - Institution of Public Health Engineers (IPHE)
21. Patra, Aditya Kumar, *Life member* - Mining, Geological and Metallurgical Institute of India (MGMI)
22. Patra, Aditya Kumar, *Life member* - Indian Science Congress Association (ISCA)
23. Patra, Aditya Kumar, *Life member* - Indian Institute of Chemical Engineers
24. Patra, Aditya Kumar, *Life member* - Society of Geoscientists and Allied Technologists (SGAT)
25. Patra, Aditya Kumar, *Life member* - IME Journal Readers' Forum
26. Patra, Aditya Kumar, *Member* - Institution of Engineers (India) (IE)
27. Verma, Abhiram Kumar, *Life Member* - International Society of Rock Mechanics
28. Verma, Abhiram Kumar, *Life Member* - Institute of Engineers (India)
29. Dey, Kaushik, *Life Member* - Indian Society of Rock Mechanics and Tunelling Technology
30. Dey, Kaushik, *Life member* - Indian Science Congress Association
31. Dey, Kaushik, *Life Member* - Mining Geological and Metallurgical Society of India
32. Dey, Kaushik, *Life Member* - Mining Engineers Association of India
33. Dey, Kaushik, *Associate Member* - Institute of Engineers (India)
34. Majumder, Arun Kumar, *Life Member* - Indian Institute of Metals
35. Majumder, Arun Kumar, *Life Member* - Institute of Standard Engineers
36. Majumder, Arun Kumar, *Life Member* - Institution of Engineers (India)
37. Majumder, Arun Kumar, *Life Member* - Indian Institute of Mineral Engineers
38. Pal, Samir Kumar, *Fellow* - The Institution of Engineers (India)
39. Pal, Samir Kumar, *Life Member* - The Mining, Geological and Metallurgical Institute of India
40. Bhattacharya, Jayanta, *Fellow* - Indian National Acedemy of Engineering
41. Bhattacharya, Jayanta, *Member* - Mining Geological and Metallurgical Institute of India
42. Bhattacharya, Jayanta, *Member* - Indian Society of Technical Education
43. Bhattacharya, Jayanta, *Member* - Institution of Engineers India
44. Bhattacharya, Jayanta, *Member* - State Environmental Appraisal Committee, West Bengal
45. Rao, Karanam Uma Maheshwar, *Fellow Institution of Engineers FIE-112784* - Institution of Enginners - FIE
46. Bhattacharjee, Ashis, *Life Member* - Mining, Geological and Metallurgical Institute of India
47. Bhattacharjee, Ashis, *Life Member* - The Institution of Engineers India
48. Mukhopadhyay, Subir Kumar, *Senior Life Member* - Indian Society of Technical Education
49. Mukhopadhyay, Subir Kumar, *Senior Life Member* - Mining Engineers Association of India
50. Mukhopadhyay, Subir Kumar, *Chartered Engineer (Regular)* - The Institution of Engineers (India) Estd. 1923
51. Mukhopadhyay, Subir Kumar, *Senior Life Member* - The Mining, Geological & Metallurgical Institute of India, Estd. 1906

#### ***Member - Editorial Board***

1. Bhattacharya, Jayanta (2010) *Member* - Journal of Mines Metals and Fuels
2. Bhattacharya, Jayanta (2012) *Member of the Editorial Board* - Institution of Enginners India Transactions on Material Science, Metallurgy and Mining
3. Majumder, Arun Kumar (2011) *Member of the Editorial Board* - World Environment
4. Mukhopadhyay, Subir Kumar (2009) *Member Editioral Board From 1999 - 2005, 2007 - till date.* - Journal of The Mining Geological & Metallurgical Institute of India (Estd. 1906)
5. Mukhopadhyay, Subir Kumar (2009) *Reviewer* - Journal of the Institution of Engineers India (1923) (Mining Engineering Division)
6. Pathak, Khanindra (2007) *Council Member* - The Indian Mining and Engineering Journal
7. Rao, Karanam Uma Maheshwar (0) *Member. Editorial Board* - International Journal of Earth Sciences And Engineering

8. Samanta, Biswajit (2010) *Member* - International Journal of Wireless Engineering and Technology
9. Samanta, Biswajit (2008) *Associate Editor* - Transactions of SME
10. Samanta, Biswajit (2008) *Associate Editor* - Mining Engineering

### ***Sponsored Research Projects***

1. An Automated Servo-controlled Direct Shear-cum-triaxial Testing Machine with Computer Control System and Power Pack (IIT Kharagpur, Rs.250.00 Lakhs)
2. Assessment Of Cracked Zone In The Post - Blast Walls Of Surface & Underground Excavations (ISIRD, SRIC,IIT Kharagpur,, Rs.5.00 Lakhs)
3. CO2 Sequestration in Abandoned Coal Mine - A Fesibility Study (DST, Rs.27.60 Lakhs)
4. Design and development of application tool for differential InSAR technique to determine ground surface movement (KCSTC, ISRO, Rs.30.00 Lakhs)
5. DESIGN AND DEVELOPMENT OF APPLICATION TOOL FOR DIFFERENTIAL INSAR TECHNIQUE TO DETERMINE GROUND SURFACE MOVEMENT (SAC, Rs.35.60 Lakhs)
6. Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-Learning (MHRD, Rs.500.00 Lakhs)
7. Development and application of a new partition curve for cyclones (Tega Industries Limited, Rs.21.00 Lakhs)
8. DEVELOPMENT OF A MATHEMATICAL MODEL FOR PREDICTING THE FISH-HOOK EFFECT IN HYDROCYCLONE CLASSIFIERS (ISIRD, SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
9. Development of a Mixed Culture Bio-Reactor For Mine Drainage Treatment (MDT) (Korean Institute of Geoscience and Mineral Resources (KIGAM) (South Korea), Rs.8.70 Lakhs)
10. Development of Indigenous Tools for carrying out Random Sampling & Testing of Explosive and Accessories used in mines of Coal India Limited (CMPDI (Coal India Limited), Rs.0.00 Lakhs)
11. Development of roof fall prediction system for underground mines using wireless network (Coal India Ltd, Rs.216.98 Lakhs)
12. Development of RS-GIS based database for Uranium Mining and Milling in the West Khasi Hills district, Meghalaya (BRNS, Rs.32.00 Lakhs)
13. Development of rubber compound and repair techniques for trailing cables of underground mining machines (Coal India Ltd, Rs.187.84 Lakhs)
14. Development of soft computing model to forecast the capacity of powered support for Indian geo-mining condition (SRIC-DST, Rs.9.00 Lakhs)
15. Dispersion of particulate matter from deep opencast mines (ISIRD, SRIC, Indian Institute of Technology Kharagpur, Rs.5.00 Lakhs)
16. Diversion of forest land for mining and other allied activities (Steel Authority of India Limited, Rs.27.30 Lakhs)
17. Effect of Mining on Water Regime (SAIL, Rs.27.80 Lakhs)
18. Effects of Mine Tailing and Jarofix leaching on Water Contamination (Hindustan Zinc Limited, Rs.19.00 Lakhs)
19. GPU BASED MULTI-TEMPORAL IMPLEMENTATION OF IMAGE CHANGE DETECTION ALOGRITHMS AND THEIR VERIFICATION (SAC, Rs.20.90 Lakhs)
20. Green house gas recovery from coal mines and unmineable coal beds and conservation to energy (EU Contribution, Rs.116.38 Lakhs)
21. Investigation on Augmentation of Life of Dump-Truck Tyres through the Improvement of Tyre Retreading Compound-Phase II (Coal India Limited, Rs.64.37 Lakhs)
22. Investigations of Bolt Behaviour in Development and Depillaring Panels under Blast Induced Dynamic Loading (CIL R&D Board, Rs.229.00 Lakhs)
23. Leaching Potential Studies of the Stock Piles of Run-of-Mine (Rom) Ore, Crusher Ore Tailings and Jarofix (LPS) (Hindustan Zinc Ltd. (HZL) Rajasthan, Rs.16.75 Lakhs)

24. Modeling Extent of Overbreak and Cracked Zone due to Blasting in Tunnels of Hydro-Electric Projects (CSIR, Rs.20.84 Lakhs)
25. National Mission on Education through Information and Communication Technology - NMEICT (MHRD, Rs.-0.00 Lakhs)
26. Numerical and Analytical Study of Crack Propagation Through Rock (ISIRD-SRIC, Rs.5.00 Lakhs)
27. Pedagogy Project for Mine Ventilation (MHRD, Rs.0.00 Lakhs)
28. Re-application of Model Studies on Gravity Blind Backfilling Method and Evaluation of a Pre-jamming Indication Parameter in the Field (Ministry of Coal, New Delhi, Rs.402.66 Lakhs)
29. Stope design and stability, production planning and paste backfilling to produce 5million tonne per annum ore from Malanjkhanda underground copper mine (Hindustan Copper Limited, Rs.119.69 Lakhs)
30. Studies on Mine Closure Planning, its Methodology and Implementation in an Open Cast and Underground Coal Mine (UCM) (South Eastern Coalfields Limited (SECL) Bilaspur, Rs.9.60 Lakhs)
31. Studies On Shrinkage Swelling Characteristics Of Some Indian Coals To Ascertain Recoverability Of Cbm From Deep Seated Coal And Shale Resources (CIL R&D, Rs.126.90 Lakhs)
32. Study of the Behavior of Oil Spill on Ocean Surface through Laboratory experiments, modeling and Satellite Image (Ministry of Earth Science, GoI, Rs.78.00 Lakhs)
33. STUDY ON MILL TAILINGS BASED COMPOSITES AS BACKFILL MATERIAL IN TUMMALAPALLE URANIUM MINES (ANDHRA PRADESH (BARC-UCIL, Rs.0.00 Lakhs)
34. Technical Study of Old and Active OB Dumps of WCL for Dimensional Optimization (CIL R&D Board, Rs.359.29 Lakhs)
35. The environmental impact of coal mines closure and ecological rehabilitation of mining area of India and Romania (Department of Science and Technology, Rs.5.20 Lakhs)
36. Underground coal gasification and its process optimisation for sub-bituminous coals of India by a laboratory study (SRIC, IIT, Rs.5.00 Lakhs)

### ***Consultancy Projects***

1. Applied Rock and Soil Mechanics Works for Mine Design System in UCIL mines (RSMW) (Uranium Corporation of India Ltd. (UCIL) GoI, Rs.9.88 Lakhs)
2. Arresting flow of fines from fines heaps at Gua ore mines (SAIL, Rs.0.80 Lakhs)
3. ASSESSMENT OF ACTION PLAN FOR DESIGN OF BREACHED ASH MOUND AT HIRAKUD UNIT OF HINDALCO INDUSTRIES LIMITED (HINDALCO Industries Limited, Rs.18.78 Lakhs)
4. Biological Condition and Ecological Assessment (BCEA) (Kolkata Municipal Corporation (KMC), Rs.2.94 Lakhs)
5. Blast design for a drive with a single boomer for 38 mm blasthole and post blast monitoring for safe blast design in haulage road (MOIL, Rs.4.00 Lakhs)
6. Coal as Raw Materials for Thermal Power Generation (The Orissa Power Generation Corporation Limited, Rs.0.79 Lakhs)
7. Consultancy by IIT-KGP for compliance of FC & EC Conditions of KIOM-MIOM, (SAIL, Rs.22.00 Lakhs)
8. Consultancy by IIT-KGP for compliance of FC & EC Conditions of Manaoharpur Iron Ore Mines, Chiria, (SAIL, Rs.11.50 Lakhs)
9. Design and Stability Analysis of Crown/ Sill Pillars below A Filled Stope (Hutti Gold Mines Ltd. A Govt. of Karnataka Undertaking, Rs.10.97 Lakhs)
10. Design of air-cooling system at SCCL mine, Kothagudem (SCCL, Rs.3.75 Lakhs)

11. Design, development and demonstration of a new hydrocyclone to analyze the feasibility of generating different quality of overflows simultaneously (Tega Industries Limited, Rs.5056200.00 Lakhs)
12. Determination of IPT and CPT of Jhillimili mine (SEC L, Rs.0.40 Lakhs)
13. Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning through ICT (Pedagogy Project; National Mission Project on Education through ICT, Rs.0.60 Lakhs)
14. Environmental impact assessment for fly-ash mixed dumping in JOCCM#1 (JSPL, Rs.5.10 Lakhs)
15. Fesibility Study of Sublebel in lode-4, F/W-A (Uranium Corporation of India Limited (UCIL), Rs.3.90 Lakhs)
16. Geo-Environmental Study for Fly-Ash Mixed Dumping in JPOCCM (JPL, Rs.5.20 Lakhs)
17. Geotechnical Instrumentation Monitoring and Data Analysis for Sub Level Open Stope at Bangur Chromite Mines (Underground) (GIMD) (The Orissa Mining Corporation, A Govt. of Orissa Undertaking, Rs.3.02 Lakhs)
18. Geotechnical Instrumentation, Monitoring and Data Analysis for open blast hole stoping at Khetri Copper Mine(Underground) (Hindustan Copper Limited, Khetri Copper Complex, P.O- Khetri Nagar - 333504, Dist. - Jhuniunu( Raj., Rs.7.10 Lakhs)
19. Heightening the tailings dam embankment at Sukinda Chromite Mines (Tata Steel, Rs.2.50 Lakhs)
20. Impact Assessment of Stoping of the L1 W2 Stope on the Settling Tanks of the Mine Water Treatment Plant (STMW) (Uranium Corporation of India Ltd. (UCIL), Rs.11.48 Lakhs)
21. Intent for Slope Stability Study of Overburden Dump at TRB Iron Ore Mines, Tensa, Jharkhand (TRBI) (Jindal Steel and Power Ltd., Sundargarh, Orissa, Rs.3.65 Lakhs)
22. NUMERICAL MODELING IN 3-DEMSION FOR SUBSIDENCE PREDICTION FOR LAWA UNDERGROUND MINES OF MMIPL (MMIPL, Rs.2.85 Lakhs)
23. Numerical Modelling of Tailings Pond Dam for TATA SCM (SCM, TATA, Rs.2.60 Lakhs)
24. Performance Measurement of Surface Miner and Cost Benefit Analysis (NALCO, Rs.3.90 Lakhs)
25. Pit Slope Stability of Limestone Mines of Ambuja Cement Ltd (Ambuja Cement Ltd, Rs.2.95 Lakhs)
26. Safety Audit of Bhushan Steel Limited (Bhushan Steel Limited, Rs.20.00 Lakhs)
27. SCIENTIFIC STUDY FOR QUARTERLY ASSESSMENT OF GEO-ENVIRONMENTAL PARAMETERS AT JINDAL POWER OPEN COAL MINES (JPL, Rs.25.60 Lakhs)
28. Sealed-off Area Monitoring by Video Photography at Kunustoria Colliery (Eastern Coalfields Limited, Kunustoria Colliery, Burdwan, Rs.1.86 Lakhs)
29. Slope Stability Assessment, Safe Overall Pit Slope Study and its control measures at Majhgawan Diamond Mine, Panna (National Mineral Development Corporation, Rs.5.68 Lakhs)
30. Slope Stability studies for Rawan Captive Limestone mine in Raipur (Ambuja Cements Ltd., Rs.4.50 Lakhs)
31. Slope Stability, safe over all pit slope study and its control measures at Majhgawan Diamond Mine (NMDC, Rs.5.68 Lakhs)
32. Slope stabilization by Vetiver System Technology (Tata Steel, Rs.24.00 Lakhs)
33. STABILITY ANALYSIS OF ASH-DYKE AT 4X250 MW JINDAL POWER PLANT, TAMNAR, RAIGARH (JPL, Rs.8.76 Lakhs)
34. Stability and strength test for Q-0, Dungri limestone Quarry (ACC Ltd, Rs.1.65 Lakhs)
35. Stability of Dump Slopes at Sukinda chromite mines, Sukinda. (TISCO -Tata Iron & Steel Co. Limited, Rs.12.00 Lakhs)
36. Stability of the parting between Ghusick (R-IX) and Ghusick (RIXA) seams and method of stabilization of void in Ghusick-A seam (R-IXA) (Eastern Coalfields Limited, Rs.8.98 Lakhs)
37. Study for fines dump slope stability at Thakurani Iron Ore Mines (FDSS) (Sarda Mines Private Limited, Rs.4.30 Lakhs)
38. Study of Dump Stability at Sukinda Chromite Mines, Tata Steel (Tata Steel, Rs.12.22 Lakhs)

39. Study of Pit Slope Stability in Kaliapani Chromite Mines of (Balasore Alloys Limited, Rs.3.00 Lakhs)
40. Study of Pit Slope Stability of Ari Dongri Iron Ore Mines (GPIL, Rs.4.66 Lakhs)
41. Study of Pit Slope Stability of Aridongri Iron Ore Mines (Godavari Power and Ispat Limited, Rs.4.66 Lakhs)
42. Study of ventilation system at Boula Chromite mine (FACOR, Rs.0.80 Lakhs)
43. Study on Impact of Surface Development on Underground Coal Mines in Durgapur and Asansol Sub-Divisions in Burdwan District (DUCM) (West Bengal Industrial Development Corporation Limited, Rs.9.37 Lakhs)
44. Study on intensity of noise and vibration due to non-blasting mechanical mining operations. (VTBM) (M/s. Birla Corporation Ltd., Rs.9.83 Lakhs)
45. Study Project for determining suitability of Surface Miners at NALCO Mines , Damanjodi , Orissa (NALCO, Rs.8.60 Lakhs)
46. Subsidence Study at ICCGroup of Mines (HCL, Rs.17.00 Lakhs)
47. Subsidence study of Surda, Kendadih & Rakha Mining Areas (SRMA) (Hindustan Copper Limited (HCL), Indian Copper Complex Mining Project, Ghatsila, Jharkhand, Rs.17.68 Lakhs)
48. Survey of Defense Land, Barrack pore Cantonment (Cantonment Board, Rs.11.00 Lakhs)
49. Survey of Defense Land, Jalapahar Cantonment (Cantonment Board, Rs.6.00 Lakhs)
50. Survey of Defense Land, LebongCantonment (Cantonment Board, Rs.5.00 Lakhs)
51. Technical Guidance in respect of Geological report of Machhakata Coal block (TGRM) (Mahaguj Collieries Limited, Rs.1.95 Lakhs)

#### **Visits Abroad by Faculty Members**

1. Dey, Kaushik - Present a Technical Paper (Turkey, ) April 16 – 19, 2013
2. Patra, Aditya Kumar - EU Project review meeting (Ljubliana and Velenje, Slovenia, ) 08-16 June 2013
3. Patra, Aditya Kumar - 23rd International Mining Conference and Exhibition (Antalya, Turkey, ) 16-19 April 2013
4. Bhattacharjee, Ashis - To discuss about collaborative research work (Moscow, ) June 25 - July 1, 2013
5. Bhattacharjee, Ashis - To present a paper at the 35th International Conference of Safety in Mines Research Institutes (London, ) October 14-17, 2013
6. Prusty, Basanta Kumar - International Conference (Vancouver Canada, ) March 2013
7. Prusty, Basanta Kumar - Attend review meeting of EU funded international research project (Slovenia, Europe, ) July 2013

#### **Invited Lectures by Faculty Members**

1. Expert Lectures on Rock Mechanics in Hard Rock Mining *by* Verma, Abhiram Kumar (ISM Dhanbad)
2. Professor S.K. Bose Memorial Lecture entitled Risk Assessment :An Emerging Trend To Address Safety *by* Bhattacharjee, Ashis (Dhanbad)
3. CO2 Sequestration in Underground Coal Mines *by* Prusty, Basanta Kumar (IIT Kharagpur)
4. Drainage of Methane for Enhanced Safety in Underground Coal Mines *by* Prusty, Basanta Kumar (IIT Kharagpur)

#### ***Books Published***

1. J Bhattacharya ( Ed): Design and Selection of Bulk Material Handling Equipment and Systems *published by* Wide Educational Products and Services (2012)
2. Jayanta Bhattacharya: Principles of Mine Planning Vol.II Enterprise Building *published by* Wide Educational Products and Services (2012)



- Jayanta Bhattacharya, Holger Lieberwirth and Bern Klien: Surface Mining: Methods, Technologies and Systems published by Wide Publishing (2014)

**Short-Term Courses, Training Programmes and Workshops organised**

- Land Acquisition and Environmental Clearance of Projects (5 day)
- Risk Assessment and Accident Prevention in Mines (November 5-8)

**Papers Published in Journals**

- A binary and ternary adsorption study of wastewater Cd (II), Ni (II) and Co (II) by  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> nanotubes By Roy, A. and Bhattacharya, J. *Separation and Purification Technology* 115:172–179 (2013)
- A critical review on importance of evaluation studies at different stages of a mining project. By I. Choudhury, S., and Patra, A. K. *Journal of Mines, Metals & Fuels* 82-87 (2013)
- A Prototype Autonomous Mine Robot for Underground Mine mapping By Ghosh, D., Chakravarty, D., Samanta, B., *CIM Magazine* Accepted (2014)
- Adsorption Studies of Indian Shale Samples: Applicability of Langmuir Model By S. Rani, B.K. Prusty and S.K. Pal *Fuel* Communicated (2014)
- Antimicrobial activity of CaO nanoparticles By Roy, A., Gauri, S.S., Bhattacharya, M. and Bhattacharya, J. *Journal of Biomedical Nanotechnology* 9(9):1570-1578 (2013)
- CO<sub>2</sub> Sequestration in Underground Coal Mines By B. K. Prusty and A.K. Patra *Journal of Mines, Metals and Fuels* Communicated (2014)
- Franken Macerals: Chemical Changes in Coal as a Result of Exposure to CO<sub>2</sub> By Michael Hitch, Maria Holuszko, Basanta K Prusty, Jiajie (Gloria) Li, and Helen Segarty Under Preparation (0)
- Gas shale as a source of energy - an overview By B K Prusty, S Rani, S K Pal and A K Patra *Indian Journal of Power and River Valley Development* Nov-Dec (2013)
- Support and Information Effect Modeling for Recoverable Reserve Estimation of a Beach Sand Deposit in India By Thakur, M., Samanta, B., Chakravarty, D. *Natural Resources Research* 15 (2013)
- Sweetmeat waste fractions as suitable organic carbon source for biological sulfate reduction By Das, B.K., Gauri, S.S., and Bhattacharya, J. *International Biodeterioration and Biodegradation* 82:215-223 (2013)
- The Role of Occupational Activities and Work Environment in Occupational Injury and Interplay of Personal Factors in Various Age Groups Among Indian and French Coal Miners By Bhattacharjee Ashis, Kunar B.M., Baumann M., and Nearkasen Chau *International Journal of Occupational Medicine and Environmental Health* 26, No. 6, 1-20 (2013)

**Papers Presented in Conferences**

- Adsorption Behavior of Coal and Shale from Jharia Coalfields – A Comparison, By B.K. Prusty, S.Rani, S.K. Pal, *International Conference on Coal and Energy*, Park Hotel, Kolkata, (2013)
- An enhanced numerical procedure for modeling fully grouted bolts intersected by rock joint, By Das, K.C., D. Deb, and A.K.Jha, *7th Asian Rock Mechanics Symposium (ARMS7)*, Seoul, South Korea, (2012)
- Analysis of Brittle Fracture in Rock using Smoothed Particle Hydrodynamics, By D. Deb and R. Pramanik, *Third Indian Rock Conference by Indian Society of Rock Mechanics and Tunnelling Technology (ISRMTT)*, IIT Roorkee, (2011)
- Analytical model for fully grouted rock bolts considering movements of rock joints, By Das, K.C., D. Deb, and G.P. Raja Sekhar, *3rd Indian Rock Conference by ISRMTT, INDOROCK-2011*, (2011)

5. Anisotropic shear strength behavior of rock joints, *By* Kumar Rakesh, Khushtar Shadab, Verma AK, *Int. Conf. on Coal and Energy – Technological Advances and Future Challenges*, Kolkata, India, (2013)
6. Assessment of Haul Road Quality using Ground Penetrating Radar, *By* Chakraborty S., and Dey K., *6th National Seminar on Surface Mining*, Dhanbad, (2014)
7. Beneficiation of Indian Rock Phosphates, *By* A K Majumder, K Dey and J Bhattacharya, *1st International Symposium on Innovation and Technology in Phosphate Industry*, Marrakech, Morocco, (2011)
8. Carbon footprint of coal mining, *By* 1. Patra, A. K., and Prusty, B. K., *23rd International Mining Congress and Exhibition*, Antalya, Turkey, (2013)
9. Comparison of Two Near-field Blast Vibration Estimation Models – A Theoretical Study, *By* Arora S., Murmu P. and Dey K., *10th International Symposium on Rock Fragmentation by Blasting FRAGBLAST*, New Delhi, (2012)
10. Development of a Fluid-Mechanical model for Flowing Film Concentrators, *By* A K Majumder, *XXVI International Mineral Processing Congress - IMPC 2012*, Hotel Ashoka, New Delhi, (2012)
11. Development of Blast Vibration Predictor Using Statistical Regression Analysis – Some Important Aspects, *By* Dey K., Bhagwat V. and Bhattacharya J., *23rd International Mining Congress and Exhibition of Turkey*, Kemer, Antalya-Turkey, (2013)
12. Establishing The Scope Of Chemo-bioreactor To Treat Metal Rich Acidic Wastewater, *By* Das, B.K., and Bhattacharya, J., *LGO-2013*, NML, Jamshedpur, India, (2013)
13. Excavation shape opening effect on fully grouted rock bolt through EFEM procedure, *By* Deb, D., K.C. Das, and S. Kavala, *3rd Indian Rock Conference by ISRMTT, INDOCK-2011*, IIT Roorkee, (2011)
14. Monitoring Ground Vibrations for Predicting Overbreak Threshold Levels in Underground Drivages, *By* Dey K. and Murthy V.M.S.R, *10th International Symposium on Rock Fragmentation by Blasting FRAGBLAST*, New Delhi, (2012)
15. Pavement Design of Haul Roads in Coal Mines - A Critical Review, *By* Mallick SR, Verma AK, Rao KUM, *6th Nat. Sem. on Surface Mining (NSSM)*, ISM Dhanbad (INDIA), (2014)
16. Prediction of Failure in Geomaterial using Smoothed Particle Hydrodynamics, *By* R. Pramanik and D. Deb, *56th Congress of the Indian Society of Theoretical and Applied Mechanics ISTAM 2011 (An International Meet)*, SVIT, Surat, (2011)
17. Process sustenance in an organic carbon exhausted chemo-bioreactor by sweetmeat waste dosing, *By* Jayanta Bhattacharya, Bidus Kanti Das, *International Mine Water Association (IMWA)*, Colorado, USA, (2013)
18. Real-Time Roof Health Status Monitoring System in Depillaring Section of a Bord and Pillar Coal Mine Using Multi-hop Wireless Sensor Network (MWSN), *By* Bhattacharjee S., D. Deb and S. K. Pal, *7th Asian Rock Mechanics Symposium (ARMS7)*, Seoul, South Korea, (2012)
19. Risk Assessment of Occupational Accidents at a Continuous Miner Worksite: An Epidemiological Study, *By* Bhattacharjee Ashis and Ravichandran Kartik, *35th International Conference of Safety in Mines Research Institutes*, London, (2003)
20. Rock Failure Analysis using Smoothed Particle Hydrodynamics, *By* R. Pramanik and D. Deb, *7th Asian Rock Mechanics Symposium (ARMS7)*, Seoul, South Korea, (2012)
21. SPH approach to rock failure with embedded discontinuity, *By* R. Pramanik, D. Deb, *RocDyn-1*, Laussane, (2013)
22. SPH Procedures for Failure Analysis of Circular Rock Disk under Distributed Arc Loading, *By* D. Deb and R. Pramanik, *10th International Symposium on Rock Fragmentation by Blasting (FRAGBLAST 10)*, New Delhi,, (2012)
23. Synthesis of magnetic adsorbent for removal of toxic heavy metals, *By* Roy A. and Bhattacharya J., *LGO 2013*, NML, Jamshedpur, India, (2013)
24. Whole Body Vibration of machine operators in opencast mines: Findings of a pilot study, *By* Patra A. K., Chaudhary D.K., and Bhattacharjee A., *Policies, Statutes, and Legislation in Mines*, Dhanbad, (2013)

## Department of Ocean Engineering & Naval Architecture

### **Head**

Prof. Trilochan Sahoo

### **Professors**

Mandal, Nisith Ranjan *Dr.Inz.(Poland)*, Wave and Tidal Energy, Computational Weld Mechanics and Welding Technology

Misra, Suresh Chandra *Ph.D.(Newcastle UK)*,

Sahoo, Trilochan *Ph.D.(IISc Bangalore)*, Coastal Hydrodynamics Hydroelasticity

Satsangi, Subir Kumar *Ph.D.(IIT Kharagpur)*, Ship Structures Structural Engineering Composite Materials Naval Architecture.

Sen, Debabrata *Ph.D.(Canada)*, Free Surface Hydrodynamics, Marine Hydrodynamics, Dynamics of Marine Vehicles, Seakeeping and Maneuvering

Sha, Om Prakash *Ph.D.(IIT Kharagpur)*, Marine Design and Production

### **Associate Professors**

Bhar, Ashoke *Ph.D.(IIT Kharagpur)*, Marine Structural Engineering

Bhaskaran, Prasad K *Ph.D (Kurukshetra)*, Wind-Wave Modeling, Marine Acoustics, Coastal Processes, Coastal Sediment Dynamics, Physical & Dynamical Oceanography, Ocean Wave Climate Projections

Warrior, Hari V , Turbulence Modeling in Oceanography, Computational Fluid Dynamics

### **Assistant Professors**

Bhattacharjee, Joydip *Ph.D.(IIT Kharagpur)*, Marine Hydrodynamics, Wave-Structure Interaction, Wave Energy Converters

Datta, Nabanita *Ph.D.(Univ. of Michigan, USA)*, Marine Dynamics, Vibrations, Hydroelasticity

Datta, Ranadev *Ph.D.*, Numerical Ship Hydrodynamics, Hydroelasticity of Floating Structures and Ships, Computational Geometry

Vishwanath, Nagarajan *Ph.D.(Osaka Univ. Japan)*, Ship motions, Rudder systems, Mathematical modelling

### **Visiting Faculty**

Sunny, Mohammed Rabius *Ph.D.(Virginia)*, Structural Engineering (Marine Structures)

### **Faculty Appointments**

Nabanita Datta Assistant Professor

Ranadev Datta Assistant Professor

Joydip BHattacharjee Assistant Professor

Md. Rabius Sunny Visiting faculty

### ***Faculty Retirement***

Misra, Suresh Chandra          Professor

### ***Brief Description of on-going activities***

The Department is continuously changing the teaching courses as per the need of industry and trend in academics. Three new electives will be introduced from next academic session. Department is in the process of enhancing the ongoing research activities in the areas of marine hydrodynamics, design and production, Coastal processes and Engineering, marine structures. The Department has introduced the International summer and winter terms into the academic programs from the current academic year. The Department runs a National Program in Marine Hydrodynamics sponsored by Naval Research Board (DRDO) which aims to bridge the knowledge gap in Marine Hydrodynamics and develop indigenous R & D capabilities on Naval Systems. Apart from some of the ongoing training program, since January, 2014, the Department is providing training program involving faculty across various discipline within the Institute to Government officers of both Gujarat and West Bengal under integrated Coastal Zone Management Project in different batches. The Department is in the process of upgrading the infrastructure and augmenting the existing laboratory facilities taking into account the increase in students strength.

### ***Thrust Areas***

1. The thrust areas of the Department includes: Marine and Ocean Hydrodynamics, Marine design and Production, Numerical Hydrodynamics, Coastal Marine Hazards, Ocean Structures, Marine Structural Analysis, Ocean Wave & Circulation Modeling, Marine Design and Production, Welding Technology, Coastal Processes and Engineering, Hydroelasticity, Storm Surge Prediction & Tsunamis, Suspended Sediment Dynamics, Marine Acoustics.

### ***New Acquisitions***

1. (i) NAPA Ship Design software, (ii) ADCIRC with SMS Interface, (iii) ORCAFLEX, (iv) WAMIT (v) MAXSURF (vi) SHIPFLOW (vii) Milling machine installed in Welding Laboratory

### ***International Collaborations***

A team from Southampton university, UK visited the Dept. for initiating collaborative research work

To initiate academic collaboration, a team from Alesund University College, Norway visited the Dept on 22nd January, 2014

### ***Lectures by Visiting Experts***

1. Scattering of a fluid-structure coupled wave at a flanged junction between two flexible waveguides by Jane B. Lawrie (Brunel University, UK)
2. 3-D flow measurement using stereo PIV/LDV system by Dr. Md. Hosseina (Dantec Dynamics, Denmark)
3. An insight into the design of the air conditioning system by Cmde A. S. Mitra (Principal Director, Directorate of Naval Architecture, Indian Navy)

### ***Doctoral and MS Degrees Awarded***

1. Sarat Chandra Mohapatra : Mathematical techniques in the hydroelastic analysis of floating and submerged flexible structures(Ph. D)
2. Bishakha Chakraborty : A response surface approach to the reliability analysis of FRP composite laminates used in ships(Ph. D)
3. Ramnarayan Mondal : Mathematical techniques for wave interaction with floating flexible structures in three dimensions(Ph.D)

### ***Member - Professional Bodies***

1. Sahoo, Trilochan, *Life Member* - Indian Society of Theoretical and Applied Mechanics(ISTAM)
2. Bhaskaran, Prasad K, *Life Member* - Indian Society of Theoretical & Applied Mechanics
3. Bhaskaran, Prasad K, *Life Member* - Ocean Society of India
4. Vishwanath, Nagarajan, *Member* - The Japan Society of Naval Architects and Ocean Engineers
5. Datta, Nabanita, *Member* - Society of Naval Architects and Marine Engineers
6. Satsangi, Subir Kumar, *Member* - Institution of Marine Technologists
7. Satsangi, Subir Kumar, *Member* - Indian Society of Technical Education
8. Satsangi, Subir Kumar, *Member* - Indian Society of Theoretical and Applied Mechanics
9. Sha, Om Prakash, *Member* - Royal Institution of Naval Architects, UK
10. Sen, Debabrata, *Life Member* - Ocean Society of India

### ***Member - Editorial Board***

1. Bhaskaran, Prasad K (2011) *Member* - Journal of Oceanography and Marine Sciences
2. Mandal, Nisith Ranjan (2010) *Editor in Chief* - Journal of Ocean and Ship Technology
3. Sen, Debabrata (2009) *Member, Editorial Board* - Journal of Ship Technology
4. Sen, Debabrata (0) *Associate Editor* - Journal of Ocean Engineering and Marine energy
5. Sha, Om Prakash (2012) *Editorial Board Member* - International Journal of Naval Architecture and Ocean Engineering (JNAOE), Korea
6. Sha, Om Prakash (0) *Reviewer* - Computer Aided Design,
7. Sha, Om Prakash (2013) *Reviewer* - Journal of Engineering for the Maritime Environment
8. Sha, Om Prakash (2010) *Reviewer* - Defence Science Journal
9. Sha, Om Prakash (0) *Reviewer* - Computer in Industry

### ***Awards & Honours***

1. Bhaskaran, Prasad K (2014) *Adjunct Professor, IIT Bhubaneshwar*
2. Bhaskaran, Prasad K (2014) *James Rennell MoES Young Fellow*
3. Bhaskaran, Prasad K (2014) *Member, Board of Studies, CUSAT Kochi*
4. Bhaskaran, Prasad K (2014) *Research Coordinator, Earth Science & Technology Cell (IIT Kharagpur)*

### ***Sponsored Research Projects***

1. An Investigation into the Maneuvering performance of ships in canals/channels around Indian Coast under different weather conditions (NRB, New Delhi, Rs.27.12 Lakhs)
2. ARTIFICIAL INTELLIGENCE FOR SOCIETAL NEEDS: KNOWLEDGE DISCOVERY AND INTELLIGENT DECISION MAKING FOR SOLVING PROBLEMS IN INDIAN CONTEXT RELATED TO ENER (IIT Kharagpur, Kharagpur, Rs.500.00 Lakhs)
3. CENTRE OF EXCELLENCE IN ROBOTICS (IIT Kharagpur, Rs.531.00 Lakhs)

4. Coastal Protection in the Mahakalpara area of Kendrapara district, Orissa (Ministry of Earth Sciences, New Delhi, Rs.44.17 Lakhs)
5. Developing a new eddy viscosity model in the presence of cavitation (NRB (submitted), Rs.0.00 Lakhs)
6. Development and Implementation of a Coupled ADCIRC-SWAN model for the Indian seas (Indian National Centre for Ocean Information Services, Ministry of Earth Sciences, Hyderabad, Rs.32.31 Lakhs)
7. Development of cage for Mari culture through numerical and physical modeling (Ministry of Earth Sciences, Government of India, Rs.47.76 Lakhs)
8. Development of high strength to weight ratio materials for the body of unmanned under water vehicle (MoES, Rs.76.02 Lakhs)
9. Experimental validation of theoretical models on sediment settling velocity and suspended sediment concentration using OCEANSAT data (NRB, New Delhi, Rs.9.56 Lakhs)
10. National Programme in Marine Hydrodynamics (Naval research board, Rs.255.00 Lakhs)
11. Research on ship maneuvering and propulsion performance using data from Voyage Data Recorder (VDR) and Automatic Identification System (AIS) (Ministry of Shipping, Government of India, Rs.27.48 Lakhs)
12. TOWING TANK EXPERIMENT FOR REDUCTION OF ENERGY DEMAND BY REDUCING RESISTANCE OF SHIPS BY FITTING BOW WINGS (SINGAPORE MARITIME INSTITUTE, Rs.18.25 Lakhs)
13. Weld Induced Distortion Analysis of 3-D Large Ship Structures (DST, New Delhi, Rs.13.44 Lakhs)

#### ***Consultancy Projects***

1. CALIBRATION OF WATER CURRENT METER (West Bengal Government, Rs.0.20 Lakhs)
2. Consultant for Project `Indigo (Tata Consultancy Services, Rs.55.00 Lakhs)
3. Design analysis and proof cheaking of 440 m long Heavy Motor Vehicle Suspension Bridge - Phase-II (Public Works Department, Govt. of Uttarakhand, Dehradun, Rs.108.00 Lakhs)
4. Design of dock gate (Kolkata Port Trust, Rs.7.50 Lakhs)
5. Design of Leaf Type Lock Gate (KoPT, Rs.4.50 Lakhs)
6. Fatigue analysis of the Platform and Seat for AK630 Gun in Naval OPV, Goa Shipyard Ltd. Yard No.: 1194-96 & 1211. (Goa Shipyard Ltd., Rs.7.25 Lakhs)
7. Fatigue Calculations for Car-on-Rail (COR) Wagon, Project of Titagarh Wagons Ltd. (Titagarh Wagons Ltd., Rs.0.00 Lakhs)
8. Hydrodynamic analysis of fishing vessels (CIFT, Cochin, Rs.5.95 Lakhs)
9. Hydrodynamic and Sediment transport mndeling studies for the Expansion of Adani Petronet Dahej Port, Gujarat (Cholamandalam MS Risk Services Ltd., Chennai, Rs.2.50 Lakhs)
10. Hydrodynamic Design & Development of Trimarans and Delta Hull Forms (NSTL Vizag, Rs.21.15 Lakhs)
11. Hydrodynamic design of high speed light weight torpedo (NSTL,DRDO, Visakhapatnam, Rs.22.25 Lakhs)
12. Impact of Storm Surge, Wind Waves and Seiches on the design of proposed Kalpasar Dam (Government of Gujarat, Rs.10.00 Lakhs)
13. MODEL FOR OCEAN WAVE ENERGY CONVERTER BUOY (DSIR (through: Mr. Sharat Kumar), Rs.1.00 Lakhs)
14. Model resistance/ self-propulsion tests, model wake measurements, hull form optimization using CFD of a 97 M OPV (GRSE, Rs.33.90 Lakhs)
15. Model Test for Self Propelled Sewage Barges Yard 446-451 (Bharati Shipyard, Mumbai, Rs.6.60 Lakhs)
16. Proof checking of the design calculations of Gantry Crane of Kankinara Project (Titagarh Marine Ltd., Rs.1.00 Lakhs)

17. Research on ship maneuvering using PMM captive tests and validation based on full scale maneuvering experiments (NSTL, Visakhapatnam, Rs.8.00 Lakhs)
18. Technical services in respect of leaf type Lock Gates at Kidderpore Dock, ( Kolkata Port Trust, Rs.8.00 Lakhs)
19. Thermal re-circulation features in ambient waters and its dispersion characteristics (SENES Consultants India Pvt. Ltd, Mumbai, Rs.6.00 Lakhs)
20. Trajectory Study of an Underwater Object (NSTL, Visakhapatnam, Rs.4.21 Lakhs)

#### **Visits Abroad by Faculty Members**

1. Datta, Nabanita - 32nd International Conference on Ocean, Offshore and Polar Engineering (Nantes, France, ) June 9-14, 2013
2. Sha, Om Prakash - Safety & Energy Efficiency in River Transportation for a Sustainable Development of the Peru Amazon (Iquitos,Peru, ) 17-19 july, 2013

#### **Invited Lectures by Faculty Members**

1. Engineering education in India – past and present *by* Satsangi, Subir Kumar (IEI (India), Kharagpur)
2. Marine hydrodynamics : Progress and Status in the National Context *by* Sen, Debabrata (NIO Goa)
3. Hydroballistics : Forces, Dynamic model and Trajectory Simulation of Underwater Objects *by* Sen, Debabrata (FM University Balasore)
4. Mathematical challenges in Hydroelasticity *by* Sahoo, Trilochan (41st Annual Conference of OMS & Intl Conference on Industrial Mathematics, KIITS Bhubaneswar)
5. Some issues on friction stir welding of AA5083 *by* Mandal, Nisith Ranjan (IIW International Congress 2014, New Delhi)
6. Weld Induced Distortion of Large Structures – Methods of Evaluation *by* Mandal, Nisith Ranjan (Indian Institute of Welding, Jamshedpur)

#### ***Short-Term Courses, Training Programmes and Workshops organised***

1. Inhouse Training Programme on Practical Shipbuilding (Mar.03-14, 2014)
2. Integrated Coastal Zone Management with Gujarat perspective (20-27 February, 2014)

#### ***Papers Published in Journals***

1. A numerical study of coastal inundation and its validation for Thane cyclone in the Bay of Bengal *By* Prasad K. Bhaskaran, R. Gayathri, P.L.N. Murty, Subba Reddy. B, Debabrata Sen *Coastal Engineering, Elsevier* 83, 108-118 (2013)
2. A numerical study of coastal inundation and its validation for Thane cyclone in the Bay of Bengal *By* Bhaskaran, P.K., Gayathri, R., Murthy, P.L.N, Bonthu, S. and Sen, D, *Coastal Engineering* Vol. 83, pp. 108-118 (2014)
3. An approach towards the design and development of a flexible 5dof AUV *By* Shome, S.N., Nandy, S., Das, S.K., Pal, D., Kumar, V, Sen, D and Ghosh, S *Indian Journal of Geo-Marine Sciences* Vol. 42 (5), pp. 565 (2013)
4. An Improved Model for the Return to Isotropy of Homogeneous Turbulence *By* Hari Warrior, Sajo Mathews, Subhendu Maity, and Kaushik Sasmal *ASME Journal of fluids engineering* doi: 10.1115/1.40262 (2014)
5. Analysis of forward speed effects on the radiation forces on a Fast Ferry *By* Datta R, Fonseca N and Guedes Soares, C *Ocean Engineering* 60, pp. 136-148 (2013)
6. Coastal vulnerability due to extreme waves at Kalpakkam based on historical tropical cyclones in the Bay of Bengal *By* Sashikant Nayak and Prasad K. Bhaskaran *International Journal of Climatology, Royal Meteorological Society* DOI:10.1002/JOC.3776 (2013)

7. Distortion Measurement of Ship Blocks using Photogrammetry By N R Mandal, Sharat Kumar and Pankaj Biswas *Journal of Ship Production and Design*, Vol.29, pp. 1-8 (2013)
8. Effect of Atmospheric Forcing on Plume Dispersion and Nuclear Effluent Trajectories Investigated Using Dispersion Modelling for Kalpakkam Coast By *Journal of Hazardous, Toxic, and Radioactive Waste* (under review) (0)
9. Forced capillary-gravity wave motion of two-layer fluid in three-dimensions By S C Mohapatra and T Sahoo *Meccanica* 49, 939–960 (2014)
10. Gravity wave interaction with porous structures in two-layer fluid By H Behera and T Sahoo *J Engineering Mathematics*, DOI: 10.1007/s10665-013-9667-0 (in press) (2013)
11. Hydroelastic analysis of surface wave interaction with concentric porous and flexible cylinder systems By S Mandal N. Datta and T. Sahoo *J Fluids and Structures* 42 , 437-455 (2013)
12. Influence of Tool Geometries and Process Variables on Friction Stir Butt Welding of Al-4.5%Cu/TiC In-Situ Metal Matrix Composites□?, By Anand Kumar, Venkateswarlu Devuri, M. M. Mahapatra, P. K. Jha, N. R. Mandal, *Materials and Design* Vol. 59 (2013)
13. Numerical Modeling of Suspended Sediment Concentration and its Validation for the Hooghly Estuary, India By Chitra Arora and Prasad K. Bhaskaran *Coastal Engineering Journal* 55 (2) (2013)
14. Oblique wave trapping by porous and flexible structures in a two-layer fluid By H. Behera, S Mandal and T. Sahoo *Physics of Fluids* Vol 25(11) (2013)
15. On friction stir butt welding of Al + 12Si/10 wt%TiC in situ composite By B. S. Yigezu, D. Venkateswarlu, M.M. Mahapatra, P.K. Jha, N.R. Mandal *Materials and Design* DOI:0261-3069 (2013)
16. On the application of a new formulation of nonlinear eddy viscosity based on anisotropy to numerical ocean models By Kaushik Sasmal, Subhendu Maity, Hari Warrior *Journal of Turbulence* (accepted) (0)
17. OVERVIEW AND PROSPECTS FOR DEVELOPMENT OF WAVE AND OFFSHORE WIND ENERGY By C. Guedes Soares, J. Bhattacharjee, D. Karmakar *Brodogradnja* No. 2 Vol. 65 (2014)
18. Performance and Validation of a Coupled parallel ADCIRC-SWAN model for THANE cyclone in the Bay of Bengal By Prasad K. Bhaskaran, Sashikant Nayak, Subba Reddy B., Murty P L N, and Debabrata Sen *Environmental Fluid Mechanics, Springer* DOI:10.1007/s10652-0 (2013)
19. Performance and validation of a coupled parallel ADCIRC-SWAN model for THANE cyclone in the Bay of Bengal By Bhaskaran, P.K., Nayak, S., Bonthu, S R, Murthy, P L N and Sen, D *Environmental Fluid Mechanics* (2013)
20. Predicting the effects of tool geometries on friction stirred aluminium welds using artificial neural networks and fuzzy logic techniques By Mohanty, H.K., Mahapatra, M.M., Pradeep K., Pankaj, B. and Mandal, N.R. *International journal of Manufacturing Research* Vol. 8, pp.296-312. (2013)
21. Response of Upper Ocean and Impact of Barrier Layer on SIDR Cyclone Induced Sea Surface Cooling By Naresh K. Vissa, A.N.V. Satyanarayana and Prasad K. Bhaskaran *Ocean Science Journal, Springer* 48(3), 1-10 (2013)
22. Scattering of gravity waves by multiple surface-piercing floating membrane By D. Karmakar, J. Bhattacharjee & C. Guedes Soares *Applied Ocean Research* 39, 40 – 52 (2013)
23. Stepped sea bottom effects on the efficiency of nearshore oscillating water column device By K. Rezanejad, J. Bhattacharjee & C. Guedes Soares *Ocean Engineering* 70, 25–38 (2013)
24. Time dependent flexural gravity waves in the presence of current By Mohanty, S K Mondal, R and Sahoo T *J Fluids and Structures* 45, 28-49 (2014)
25. Wave forecasting system for operational use and its validation at coastal Puducherry, east coast of India By Sandhya K G, Balakrishnan Nair, T M, Prasad K Bhaskaran, Sabique L, Arun N and Jeykumar K *Ocean Engineering, Elsevier* 10.1016/j.oceaneng.2 (2014)
26. Wave Structure Interaction Problems in Three-layer Fluid By R Mondal and T. Sahoo *ZAMP* 65(2), 349-375 (2014)



### *Papers Presented in Conferences*

1. A polynomial chaos approach to predict uncertainty in twin-propeller twin-rudder ship maneuvers, By Anil Kumar Dash, Vishwanath Nagarajan, Om Prakash Sha, *Annual Spring Meeting, The Japan Society of Naval Architects and Ocean Engineers*, Sendai, Japan, (2014)
2. A polynomial chaos approach to predict uncertainty in twin-propeller twin-rudder ship maneuvers, By Anil Kumar Dash, Vishwanath Nagarajan, Om Prakash Sha, *Annual Spring Meeting, The Japan Society of Naval Architects and Ocean Engineers*, Sendai, Japan, (2014)
3. A study on applicability of CFD for a variety of practical marine hydrodynamic problems, By Sen, D and Saripilli, JaiRam, *Int. conf. on Ship and Offshore Technology*, IIT Kharagpur, (2013)
4. AN INVESTIGATION TOWARDS ANALYSING MANEUVERING PERFORMANCE OF KVLCC2 VESSEL USING CFD, By A V Saj, O P Sha, V Nagarajan, *ICSOT 2013: Technical Innovation in Shipbuilding*, IIT Kharagpur, (2013)
5. AN INVESTIGATION TOWARDS ANALYSING MANEUVERING PERFORMANCE OF KVLCC2 VESSEL USING CFD, By A V Saj, O P Sha, V Nagarajan, *ICSOT 2013: Technical Innovation in Shipbuilding*, IIT Kharagpur, (2013)
6. Analytical and numerical study of nearshore multiple oscillating water columns, By K. Rezanejad, J. Bhattacharjee & C. Guedes Soares, *32nd Intl. Conf. on Ocean, Offshore and Arctic Engg. (OMAE2013)*, Nantes, France, (2013)
7. CFD ANALYSIS FOR A BALLAST FREE SHIP DESIGN, By Avinash Godey, S.C.Misra, O.P.Sha, *International Conference on Advanced Technologies for MANAGEMENT OF BALLAST WATER & BIOFOULING (MABB 2014)*, NIOT. Chennai, (2014)
8. Challenges in Ship Production, By N R Mandal, *Shipbuilding Challenges Faced by India and the Role of NIRDESH*, Calicut, (2013)
9. Effect of current on time dependent capillary gravity wave motion in two-layer fluid, By S. K. Mohanty and T. Sahoo, *ISTAM-2013*, BESU, Kolkata, INDIA, (2013)
10. Expansion formula for velocity potential for wave interaction with floating and submerged structures, By S C Mohapatra, T Sahoo, *Intl Workshop on Water Waves and Floating Bodies*, (2013)
11. Failure load estimation of marine composite panels, By Satsangi S.K., and Das,J, *5th Indian National Conf. on Harbour and Ocean Engg.,(INCHOE 2014)*, CSIR-NIO,, (2014)
12. Feasibility Study and Design of Shallow Draft Ore Carriers for Inland Waterways, By O P Sha, satish Paliencar, S C Misra and Vishwanath Nagarajan, *Safety & Energy Efficiency in River Transportation for a Sustainable Development of the Peru Amazonian Region*, Iquitos, Peru, (2013)
13. Finite element analysis of laminated composites using a recently developed semi-refined HSDT, By Bhar, A., Satsangi S., K.,and Bhattacharyya,S.K., *Proc. ISTAM 2014*, BESU, Howrah, (2013)
14. Finite element analysis of failure of laminated composite plate for marine structures, By Das,J., Satsangi S.K., and Parihar,Y., *Proc. ISTAM 2014*, BESU, Howrah, (2013)
15. Finite element analysis of laminated composite stiffened annular sector plates., By Bhar, A., Satsangi, S. K. and Bhattacharya, S. K., *Proc. Conf. on Ship and Offshore Structures (ICSOT 2013) Royal Inst. Of Naval Architects*, IIT Kharagpur, (2013)
16. Forced damped wet vibration analysis of an idealized compliant tower in the Indian Ocean, with superstructure due to current loads, wave excitation, and earthquake impulses, By Ankit, N.Datta., *33rd International Conference on Ocean, Offshore and Polar Engineering*, San Francisco, CA, USA, (2014)
17. Friction Stir Welding of 5083 Aluminum Alloy, By N.R. Mandal, Sharat Kumar and Pankaj Biswas, *National Conference on Advances in Naval Materials*, NIOT, Chennai, (2013)
18. Gravity wave interaction with porous and flexible cylinder system, By S Mandal and T. Sahoo, *INCHOE-2014*, NIO, GOA, (2014)

19. Human Values in Higher Education, *By* N R Mandal, *One-Day Workshop on Human Values in Higher Education*, IIT Delhi, (2013)
20. Hydroelasticity analysis of ships in waves, *By* Ranadev Datta, Mohammed R. Sunny, *International Conference on Hydrodynamics*, Singapore, (2014)
21. Modeling the Forces and Motions of a Single Point Mooring Marine Aquaculture Cage, *By* Mohd Atif Siddiqui, Vishwanath Nagarajan, Chanchal Kumar Mukherjee, *24th International Ocean and Polar Engineering Conference, ISOPE-2014 Busan*, Busan, Korea, (2014)
22. Non-linear Forced Vibration Analysis of a Marine Cycloidal Propeller, *By* Joseph Prabhu, Vishwanath Nagarajan, Om Prakash Sha, *International Mechanical Engineering Congress 2014*, NIT Tiruchirappalli, (2014)
23. Non-linear Forced Vibration Analysis of a Marine Cycloidal Propeller, *By* Joseph Prabhu, Vishwanath Nagarajan, Om Prakash Sha, *International Mechanical Engineering Congress – 2014*, NIT Tiruchirappalli, (2014)
24. Numerical modeling of an offshore fishing cage, *By* Mohd. Atif Siddiqui, Vishwanath Nagarajan, *International Conference on Applied Mathematical Models (ICAMM 2014)*, PSG College of Technology, Coimbatore, (2014)
25. Numerical modelling of a heaving point absorber in front of a vertical wall, *By* J. Schay, J. Bhattacharjee & C. Guedes Soares, *32nd Intl. Conf. on Ocean, Offshore and Arctic Engg. (OMAE2013)*, Nantes, France, (2013)
26. NUMERICAL SELF PROPULSION SIMULATION AND PROPELLER INDUCED VIBRATION STUDY, *By* Ishaq Makkar and O P Sha, *ICSOT 2013: Technical Innovation in Shipbuilding*, IIT Kharagpur, (2013)
27. Oblique Wave Scattering By A Submerged Porous Breakwater, *By* S. Koley, H. Behera and T. Sahoo, *ISTAM-2013*, BESU, Kolkata, INDIA, (2013)
28. Oblique wave scattering by partial porous structures of finite width in a two-layer fluid, *By* H. Behera and T. Sahoo, *ISTAM-2013*, BESU, Kolkata, INDIA, (2013)
29. Oblique wave trapping by a submerged porous structure near a wall, *By* S. Koley H Behera and T. Sahoo, *INCHOE-2014*, NIO, GOA, (2014)
30. PERTURBATION STABILITY ANALYSIS OF NONLINEAR MATHEMATICAL MODEL, *By* Anil Kumar Dash, Vishwanath Nagarajan, *58th Congress of the Indian Society of Theoretical and Applied Mechanics (ISTAM 2013) An International Conference*, BESU, Kolkata, (2013)
31. Prediction of Ship Maneuvering Characteristics using CFD, *By* Seemontini RoyChoudhury, Vishwanath Nagarajan, Om Prakash Sha, *24th International Ocean and Polar Engineering Conference, ISOPE-2014*, Busan, Korea, (2014)
32. Prediction of Ship Maneuvering Characteristics using CFD,, *By* Seemontini RoyChoudhury, Vishwanath Nagarajan, Om Prakash Sha,, *24th International Ocean and Polar Engineering Conference, ISOPE-2014*, Busan, Korea, (2014)
33. Reliability Analysis Using a Response Surface Method for Laminated Composite Stiffened Plates, *By* B.Chakraborty , A.Bhar, *International Conference on Ship and Offshore Technology*, IIT Kharagpur, (2013)
34. SHIP COLLISION RISK ASSESSMENT USING AIS DATA, *By* Saurav Mandal, Shwetabh Suman, Vishwanath Nagarajan, Om Prakash Sha, *International Mechanical Engineering Congress 2014*, NIT Tiruchirappalli, (2014)
35. SHIP COLLISION RISK ASSESSMENT USING AIS DATA, *By* Saurav Mandal, Shwetabh Suman, Vishwanath Nagarajan, Om Prakash Sha, *International Mechanical Engineering Congress – 2014*, NIT, Tiruchirappalli, (2014)
36. Ship maneuvering mathematical model for twin-propeller twin-rudder, *By* A K Dash, Vishwanath Nagarajan, O P Sha, *ICSOT 2013: Technical Innovation in Shipbuilding*, IIT Kharagpur, (2013)
37. Ship structures and finite element analysis, *By* Satsangi, S.K, *Presidential Address. ISTAM 2014*, BESU, Howrah, (2013)
38. Stability Analysis of Ship Maneuvering Model, *By* Anil Kumar Dash, Vishwanath Nagarajan, *INTERNATIONAL CONFERENCE ON APPLIED MATHEMATICAL MODELS ICAMM 2014*, PSG COLEGE OF TECHNOLOGY, COIMBATORE, (2014)

39. Time dependent flexural gravity wavemaker problem, *By* S K Mohanty, R Mandal, T Sahoo, *Intl Workshop on Water Waves and Floating Bodies*, France, (2013)
40. Trapping of oblique waves by porous and flexible barriers near a wall in two-layer fluid, *By* S. Koley H Behera and T. Sahoo, *INCHOE-2014*, NIO, GOA, (2014)
41. Wave interaction with circular flexible structure in two-layer fluid, *By* S. Mandal, R. Mondal and T. Sahoo, *ISTAM-2013*, BESU, Kolkata, INDIA, (2013)

## Department of Physics

### **Head**

Prof. Arghya Taraphder

### **Professors**

Bharadwaj, Somnath	<i>Ph.D.(IISc Bangalore)</i> , Astrophysics, Cosmology
Datta, Prasanta Kumar	<i>Ph.D.(Burdwan Univ)</i> , Ultrafast Lasers and Nonlinear Optics, Photonics
Kar, Sayan	<i>Ph.D.(IIT Kanpur)</i> , Gravitation and Geometry, High Energy Physics, Quantum mechanics
Kumar, Krishna	<i>Ph.D.(IIT Kanpur)</i> , Hydrodynamic flows, Pattern-forming instabilities
Mathur, Balbir Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Web Based Service, Microprocessor, ERP, Thin Films
Ray, Samit Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Semiconductor nanostructures, Condensed Matter Physics, Thin Films, Photovoltaics
Roy, Anushree	<i>Ph.D.(IISc Bangalore)</i> , Raman spectroscopy
Sharma, Shivcharan Lal	<i>Ph.D.(IIT Kanpur)</i> , Effects of Ionizing Radiation on Semiconductor Thin Films, Physics and Technology of Ionizing Radiation, Monte Carlo Simulations, Physics of Semiconductors and Semiconductor Devices, Fission Dynamics
Taraphder, Arghya	<i>Ph.D.(IISc Bangalore)</i> , Condensed matter physics, Condensed matter physics

### **Associate Professors**

Das, Amal Kumar	<i>Ph.D.(IOP Bhubaneswar)</i> , Experimental Condensed Matter Physics, Magnetism including spintronics, Magnetic semiconducting nanoparticles and thin films, Mechanical and magnetic stress measurement of thin films
Dhar, Achintya	<i>Ph.D.(Jadavpur Univ)</i> , Organic Semiconductors, Semiconductor Nanostructures, Heterostructure Devices, Organic Solar Cells
Goswami, Dipak Kumar	<i>Ph.D.(Institute of Physics, Bhubaneswar)</i> , Surfaces and Interfaces Science, Nanoscale Science, Organic Semiconductors Thin Films and Nanostructures Growth, Organic Field-Effect Transistors (OFETs): Fabrication and Characterization, X-ray Physics, Ion-solid Interaction
Khastgir, Sugata Pratik	<i>Ph.D.(IOP Bhubaneswar)</i> , Mathematical Physics/High Energy Physics
Majumder, Sonjoy	<i>Ph.D.(IIA Bangalore)</i> , Computational Many-body physics, Atomic & Molecular Physics, Theoretical modeling of bulk and nano-materials, Astronomy and Astrophysics, Physics of Ultra-Cold atom
Nath, Tapan Kumar	<i>Ph.D.(IIT Kanpur)</i> , Magnetic oxide thin films and multilayers, Spin electronics, Nanostructured Magnetic oxides, Magnetic Alloys, Multiferroics, Condensed Matter Physics (Low temperature Physics), Magnetism and Superconductivity, Magnetic semiconductors, Strongly Correlated System
Panigrahi, Kamal Lochan	<i>Ph.D.(Institute of Physics, Bhubaneswar)</i> , String Theory, High Energy

Physics, String Inspired Cosmology

Roy Chaudhuri, Partha	<i>Ph.D.(IIT Delhi)</i> , Fiber & Integrated Optics and Optoelectronics, Experimental Bio-Photonics & Nano-Photonics
Shukla, Pragya	<i>Ph.D.(JNU Delhi)</i> , Random matrix theory and Quantum Chaos, Condensed Matter Physics, Statistical Studies of Complex Systems, Theoretical Physics
Singh, Ajay Kumar	<i>Ph.D.(Calcutta Univ)</i> , Experimental Nuclear Physics, Double Beta decay studies
Srivastava, Sanjeev Kumar	<i>Ph.D.(JNU, New Delhi)</i> , Materials Engineering using Ion Beams, Nuclear Condensed Matter Physics, Quantum Criticality

***Assistant Professors***

Banerjee, Debamalya	<i>Ph.D.(IISc. Bangalore)</i> , Electron Paramagnetic Resonance (EPR), Supercooled liquid dynamics, Dynamic nuclear polarization (DNP)
Bhaktha, Shivakiran B N	<i>Ph.D.(Univ of Hyderabad)</i> , Glass Photonics, Optofluidics, Random Laser
Chandra, Amreesh	<i>Ph.D.(I.T., B.H.U.)</i> , Multifunctional Ceramics, Energy Systems, Polymer Composites, Experimental Condensed Matter Physics, Microbial Fuel Cells, Supercapacitors
Das, Baidya Nath	<i>Ph.D.(IIT Kharagpur)</i> , condense matter physics
Gupta, Amar Nath	<i>Ph.D.(JNU)</i> , Biophysics and Soft Matter Physics
Hundi, Raghavendra Srikanth	<i>Ph.D.(Harish Chandra Research Institute)</i> , Theoretical particle physics
Manoj, Brundavanam Maruthi	<i>Ph.D.(Hyderabad Univ.)</i> , Singular Optics, Applied Optics, Ultrafast Laser Filamentation
Roy, Samudra	<i>Ph.D.(Jadavpur Univ.)</i> , Silicon Photonics, Nonlinear Photonics, Plasmonics

***Scientific Officer***

Chakraborty, Syamal	<i>Ph.D.(IIT Kharagpur)</i> ,
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***Faculty Appointments***

Dr. M.M. Brundavanam	Assistant Professor
Dr. S. Roy	Assistant Professor
Dr.R.S. Hundi	Assistant Professor
Dr. A.N. Gupta	Assistant Professor
Dr. D. Banerjee	Assistant Professor
Dr. D.K. Goswami	Associate Professor

### ***Brief Description of on-going activities***

The Department is carrying out research and development utilizing in-house facilities and in collaboration with sister departments. Many of the facilities have been developed in the department and procured from sponsored projects. Faculty and scholars are carrying out active research in the following areas: Astrophysical Spectroscopy, Astrophysics, Atmospheric Sciences, Atomic and Molecular Physics, Biophysics, Condensed Matter Physics, Physics of Complex Systems, Cosmology, Electronic properties of solids, ERP, Bio-Photonics, Optical Imaging, Nuclear Physics, Ferroelectricity, Fiber & Integrated Optics, Optoelectronics, Gravitation and Geometry, High Energy Physics, Hydrodynamics, Laser Physics, Nonlinear Optics, Photonics, magnetic semiconducting nanoparticles and thin films, Magnetism, Spintronics, Materials engineering, Mathematical Physics, Mechanical and magnetic stress, Microprocessors based systems, Monte Carlo Simulation of Radiation Detectors, Semiconductor Devices, Nano- and Bulk-material science, Nanostructured Magnetic Materials, Magnetic thin films and Multilayers, Multiferroics, Nanotechnology, Nonlinear Dynamics, Nonlinear instabilities, Nuclear condensed matter physics, Nuclear Structure, Double Beta Decay and Neutrino Physics, Optoelectronics, Organic Electronics, Particle and Cluster Emission in Fission and Fusion-Fission, Physics of Semiconductor Crystals and Thin Films, Quantum Many-Body Theory, Radiation Measurement Techniques, Radiation Sensors and Dosimetry, Renewable Energy Sources, Semiconductors, Nanostructures, Solid State Ionics, Thermoelectricity, Web Based Services, Engineering and characterization of materials using ion beams, String Theory, Superconductivity

### ***Thrust Areas***

1. Condensed Matter Physics
2. Non-linear Dynamics and complexity
3. Astronomy and Astrophysics
4. Nuclear and Particle Physics
5. Optics and Photonics

### ***Lectures by Visiting Experts***

1. LIGO-India: Locating Einsteins messengers and Inaugurating Gravitational Wave Astronomy *by Prof. BalaIyer (Raman Research Institute, IndIGO Consortium, Bangalore)*
2. At the donor/acceptor interface in Organic Photovoltaics: Energy or Charge transfer? *by Dr. Raavi Sai Santosh Kumar (Nanyang Technological University, Singapore)*
3. Novel Transport phenomena in hybrid junctions of Nanowires *by Dr. Arijit Saha (Department of Physics, University of Basel, Switzerland)*
4. Ultrafast probes Ultra-small: Using few-femtosecond IR pulses and EUV spectroscopy to interrogate collective dynamics in nanoscale plasmon and superfluid *s by Dr. Sivarama Krishnan (TIFR-Hyderabad)*
5. Quest for new physics in condensed matter systems *by Mr. Sitikantha Dhurjati Das (Quantum Matter Group, Cavendish Laboratory, Cambridge UK)*
6. Towards Physical Quantum Computation - Solving MAX 2-SAT using Quantum Annealing *by Mr. Siddhartha Santra (University of Southern California, L.A. and Center for Quantum Information Science and Technology, USC, L.A.)*
7. Topological parameters in classical and quantum gravity *by Dr. Sandipan Sengupta (Raman Research Institute, Bangalore)*
8. Berry phase and gauge anomalies *by Mr. Vatsal Dwivedi (Department of Physics, University of Illinois at Urbana-Champaign, USA)*
9. Study of electron-phonon interaction with self-consistent basis generation scheme *by Dr. Monodeep Chakraborty (Department of Solid State Physics, IACS, Kolkata)*
10. Magneto-optic Kerr microscopy for nanomagnetism *by Prof. Subhankar Bedanta (National Institute of Science Education and Research (NISER), Bhubaneswar)*

11. NMR as a local probe of magnetism and spin dynamics *by* Dr. Panchanana Khuntia (Max Planck Institute for Chemical Physics of Solids, Dresden, Germany)
12. Studies on intermetallic compounds by perturbed angular correlation *by* Prof. C. C. Dey (SINP Kolkata)
13. Probing the Universe through Neutral Hydrogen Distribution *by* Prof. Tirthankar Roy Choudhury (NCRA-TIFR, Pune)
14. Some aspects of correlated material phenomena *by* Dr. Anamitra Mukherjee (University of Tennessee, Knoxville)
15. Quantum electronic and high frequency transport in carbon superlattice systems *by* Prof. Somnath Bhattacharyya (School of Physics, & Centre of Excellence in Strong Materials, University of the Witwatersrand, Johannesburg, South Africa)
16. Magnetically Disordered Interfaces in Magnetic Tunnel Junctions *by* Dr. Kalpataru Pradhan (University of Augsburg, Germany)
17. Bertrand Space-times, or, what General Relativity can teach us about galaxies *by* Prof. Tapobrata Sarkar (Department of Physics, Indian Institute of Technology Kanpur)
18. The Pebble Bed Modular Reactor, its Implications for Power Consumption in Developing Countries and some Material Properties of its Fuel *by* Professor Johan B Malherbe (Dept. of Physics, University of Pretoria, Pretoria 0002, South Africa)
19. A needlet ILC analysis of WMAP 9-year data *by* Dr. Soumen Basak (Service d'Astrophysique (SAP), Centred Etudes de SACLAY, France)
20. Ultrafast Dynamics of the Excited States Using Femtosecond Time-Resolved Spectroscopy *by* Dr. Dipak K. Palit (Head, Radiation & Photochemistry Division, Bhabha Atomic Research)
21. Coherent Control : Replacing Serendipity with Intention *by* Dr. Sisir K. Sarkar (Director, Chemistry Group, Bhabha Atomic Research Centre, Mumbai)
22. Laws of Universe *by* Professor Jnanadeva Maharana (Institute of Physics, Bhubaneswar)
23. Structural transitions of colloids under magnetic field & compressive strain *by* Dr. Junaid Masud Laskar (Max Planck Inst. for Dynamics and Self organization, Goettingen, Germany)
24. Gravitational Lensing: Probing the Unseen and Unaccounted for *by* Professor D. Narasimha (Tata Institute of Fundamental Research, Mumbai)

#### ***Doctoral and MS Degrees Awarded***

1. Tirupathi Patri : Establishing structure-property correlation in multiferroic  $\text{Bi}_{1-x}\text{Ca}_x\text{FeO}_3$  nanoceramics and solid solution with ferroelectric  $\text{PbTiO}_3$  and  $\text{BaTiO}_3$ (PhD)
2. Kajal Mondal : Light Propagation in Microstructured Holey Optical Fibers and Designing New Fibers and In-line Active Fiber Devices(PhD)
3. K.D. Chandra Sekhar : Exploring the correlation of structural, magnetic and magnetodielectric properties in  $\text{R}_2\text{MnNiO}_6$  and  $\text{R}_{1-x}\text{Ca}_x\text{MnO}_3$ (R=Rare earth) Perovskite systems.(PhD)
4. Trilochon Sahoo : Microstructure controlled magnetoimpedance behavior of rapidly solidified iron-and cobalt-based metallic glass ribbons(PhD)
5. Pankaj Kumar Sinha : Studies on Three Dimensional Variational Data Assimilation of Wind Observations in Simulating Meteorological Systems over the Indian Region(PhD)
6. Suman Majumder : Probing the Epoch of Reionization through Radio-Interferometric Observations of Neutral Hydrogen(PhD)
7. Sudipta Koley : Correlated Electronic Models for Transition Metal Dichalcogenides(PhD)

#### ***Member - Professional Bodies***

1. Datta, Prasanta Kumar, *Member* - SPIE (USA)
2. Datta, Prasanta Kumar, *Regular* - Optical Society of America
3. Datta, Prasanta Kumar, *Life* - Indian Laser Association

4. Datta, Prasanta Kumar, *Regular Associate* - International Centre for Theoretical Physics, Trieste, Italy
5. Nath, Tapan Kumar, *Life Time Member* - Magnetic Society of India
6. Nath, Tapan Kumar, *Life time member* - Material Research Society of India
7. Nath, Tapan Kumar, *Full Member* - American Nano Society
8. Roy Chaudhuri, Partha, *Regular* - KIT International Exchange Club, Japan
9. Roy Chaudhuri, Partha, *Life Member* - Indian Science Congress Association, ISCA
10. Roy Chaudhuri, Partha, *Life Member* - Optical Society of India, OSI
11. Roy Chaudhuri, Partha, *Regular* - Optical Society of America, OSA
12. Roy Chaudhuri, Partha, *Life Member* - Institute of Electronics & Telecommunication Engineers, IETE
13. Srivastava, Sanjeev Kumar, *Member* - Indian Science Congress Association
14. Srivastava, Sanjeev Kumar, *Member* - Indian Physical Society
15. Chandra, Amreesh, *Life Member* - Indian Science Congress Association
16. Chandra, Amreesh, *Life Member* - Indian Solid State Ionics Society
17. Sharma, Shivcharan Lal, *Life Member* - Indian Physics Association
18. Sharma, Shivcharan Lal, *Life Member* - Indian Physical Society
19. Sharma, Shivcharan Lal, *Member* - IEEE
20. Sharma, Shivcharan Lal, *Life Member* - Acoustical Society of India
21. Sharma, Shivcharan Lal, *Life Member* - Materials Research Society of India
22. Sharma, Shivcharan Lal, *Life Member* - Indian Society for Radiation Physics
23. Sharma, Shivcharan Lal, *Life Member* - Nuclear Track Society of India
24. Ray, Samit Kumar, *Member* - MRS, USA
25. Ray, Samit Kumar, *Member* - IEEE, USA
26. Bharadwaj, Somnath, *Member* - International Astronomical Union
27. Kar, Sayan, *Member* - Indian Association for General Relativity and Gravitation
28. Mathur, Balbir Kumar, *Senior Member* - IEEE
29. Mathur, Balbir Kumar, *Lile member* - MRSI
30. Mishra, Shradha, *Member* - American Physical Society

#### ***Member - Editorial Board***

1. Bharadwaj, Somnath (2010) *Member Editorial Board* - Journal of Astrophysics and Astronomy
2. Kar, Sayan (2011) *Member, Editorial Board* - Indian Journal of Physics
3. Nath, Tapan Kumar (2012) *Editorial Board Member* - ScienceJet
4. Nath, Tapan Kumar (2012) *Editorial Board Member* - Journal of Spintronics and Magnetic Nanomaterials
5. Nath, Tapan Kumar (2012) *Editorial Board Member* - Dataset Papers in Nanotechnology
6. Panigrahi, Kamal Lochan (0) *Editorial Board Member: High Energy Physics* - The Scientific World Journal
7. Panigrahi, Kamal Lochan (0) *Editorial Board Member: High Energy Physics* - Dataset Papers in Physics
8. Ray, Samit Kumar (2011) *Editorial Board Member* - Journal of Nano Energy and Power Research.
9. Ray, Samit Kumar (2011) *Member of the Editorial Board* - Nanotrends
10. Ray, Samit Kumar (0) *Associate Editor* - Frontiers in Materials : Optics and Photonics
11. Roy, Samudra (0) *Referee* - Optics and Laser Technology (Elsevier)
12. Roy, Samudra (0) *Referee* - Optics Express (OSA)
13. Roy, Samudra (0) *Referee* - Optical Fiber Technology (Elsevier).
14. Roy, Samudra (0) *Referee* - Journal of Optical Society of America B
15. Shukla, Pragma (2013) *Review Editor* - Frontiers in Physics



### ***Awards & Honours***

1. Shukla, Pragma (2013) *Paper Physical curl force... selected as Highlight of the year 2013 by J. Phys. A, IOP Publication*
2. Shukla, Pragma (2014) *Paper Super adiabatic dipole ... selected as Highlight of the year 2014 by J. Phys. A, IOP Publication*

### ***Sponsored Research Projects***

1. A Detailed Study of the Effect of Gamma Radiation on Structural, Optical and Electrical Properties of Indium Oxide Doped Tellurium Dioxide Thin Films (DAE-BRNS-GOI (Submitted for funding), Rs.36.00 Lakhs)
2. Co-operative Phenomena and Nanosize effect in some Correlated Systems (DAE-BRNS, Rs.18.00 Lakhs)
3. Detection/measurement of low magnetic field through phase modulation of light in optical fiber/ photonic crystal fiber coated with ceramic magnetostris (BRNS, Government of India, Rs.15.65 Lakhs)
4. Development and Characterization of Nanostructured thin films for SiGe Quantum Well Infrared Photodetector (QWIP) and ferroelectric based gas/chemi (DRDO, Rs.201.80 Lakhs)
5. Development of Fluorescent Whole Cell Optical Fibre Biosensor for Heavy Metal Pollutants (DOB, Ministry of Science and Technology, Government of India, Rs.44.00 Lakhs)
6. Development of Rare-Earth Doped Low-Loss Glass-Ceramic Waveguides by Sol-gel technique for Photonics Applications (ISIRD, IIT Kharagpur, Rs.5.00 Lakhs)
7. Development of Real Time Gamma Radiation Dosimeters Employing Thin Films of Different Metal Oxides and Their Mixtures (BRNS-DAE-GOI (SRIC-Code: DRG), Rs.35.55 Lakhs)
8. Development of realtime gamma dosimeters employing thin films of different metal oxides and their mixtures. (BRNS, Rs.36.00 Lakhs)
9. Experimental investigation of the modes of random laser in disordered microfluidic channels. (SERB (DST, Young Scientist), Rs.24.24 Lakhs)
10. Generation of tunable mid-infrared coherent radiation in the range of 12.7-17 $\mu$ m for strategic spectroscopic application (BRNS, Rs.22.57 Lakhs)
11. Graphene based hybrid solar cells (CSIR, Rs.20.92 Lakhs)
12. Green photonics using semiconductor nanostructures (DST, Rs.32.45 Lakhs)
13. Investigation of Electrical-, Magneto-Transport, Extraordinary Hall resistivity, Specific Heat and Magnetic studies in nanostructured CMR Manganites (DST, India (Completed, 2012-13), Rs.128.00 Lakhs)
14. MBE growth of strained Si/Ge layers and self-assembled Ge islands for heterostructure MOSFETs and flash memory devices (DST, New Delhi, Rs.161.66 Lakhs)
15. Molecular Structural Evolution of Nanoparticles Mediated Amyloid Protein Fibrils (DST, Rs.0.00 Lakhs)
16. Nanomaterials for smart energy systems (UKIERI, Rs.16.00 Lakhs)
17. Polymer composites for energy systems (Max Planck Society (Germany), Rs.8.50 Lakhs)
18. Pre-operative programme for Indian participation in the FAIR project at GSI, Darmstadt Germany- Accelerator and Detector-related R&D and protot (DST, Rs.15.00 Lakhs)
19. Proposal for Developing an Advanced Electromagnetic Modeling Platform for Complex, Arbitrary Microstructured Fiber and Designing Inline Active and No (DST, Government of India, Rs.10.80 Lakhs)
20. Realization of Packet-switched Node with optoelectronic and Photonic technologies for ultrabroadband communication systems and networks (Italian Ministry of Education, University and Research, Rs.300.00 Lakhs)
21. Second order cascaded nonlinear optical processes for all-optical photonic devices (DST, Govt. of India, Rs.7.62 Lakhs)
22. Semiclassical strings in AdS/CFT (DST, Rs.11.84 Lakhs)

23. Semiconductor Superlattices for Terahertz Emission at Room Temperature (DST-Russian Foundation of Basic Research, Rs.17.40 Lakhs)
24. Si/Ge Nanostructure sensitized hybrid solar cells (DST, Rs.47.45 Lakhs)
25. Studies on Laser-Optical Fiber-Based Micro-Imaging Techniques in the Analysis of Tissue Structure and Detection of Abnormalities (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
26. Studies on Ultrafast Processes for Electronic, Spintronic, Magnonic and Photonic Applications, (SGIGC, IIT Kharagpur (2014), Rs.250.00 Lakhs)
27. Study of hyperfine structure and isotope shift of Isotopes using relativistic highly correlated many-body theory (BRNS, DAE, Rs.17.00 Lakhs)
28. Theoretical studies on transition metal dichalcogenides (TID) (DST, Rs.15.00 Lakhs)
29. Theoretical Study of Hyperfine Interaction in Heavy Atoms and Molecules for Quantum Computation and Frequency Standard (IIT-Kharagpur(ISIRD), Rs.3.00 Lakhs)
30. To strengthen the post-graduate teaching and research facilities in the department (DST, New Delhi, Rs.365.00 Lakhs)
31. Upgradation of Basic Low Temperature and High Magnetic Field Facility for Spin-Electronics Research, (SGIRG, IIT Kharagpur (2014), Rs.25.00 Lakhs)

### ***Consultancy Projects***

1. Development of Admission Modules (IISER Admission Committee, Rs.6.00 Lakhs)
2. Guest House management System (IIT Kharagpur, Rs.3.00 Lakhs)
3. Measurement of optical nonlinearity of organic and polymer samples (DMSRDE, DRDO Kanpur, Rs.0.53 Lakhs)
4. Students Academic Management (IISER Pune, Rs.6.00 Lakhs)
5. Thin Film Characterization (Various departments & agencies, Rs.0.00 Lakhs)

### ***Patents (filed / granted)***

1. Solar based mobile charger

### **Visits Abroad by Faculty Members**

1. Chandra, Amreesh - Collaborative Program (Max Planck Institute for Polymer Research, Germany, ) 1 month
2. Chandra, Amreesh - AvH Foundation sponsored CONNECT program (TU Braunschweig, Germany, ) 28 days
3. Chandra, Amreesh - Synchrotron XRD experiments (Photon Factory, Tsuka, Japan, ) 7 days
4. Shukla, Pragya - Scientific collaboration as Senior Associate (International Center for Theoretical Physics (ICTP), Trieste, Italy, ) 1 month
5. Shukla, Pragya - Scientific collaboration (National University of Singapore, Singapore, ) 10 Days
6. Srivastava, Sanjeev Kumar - Experiment (DESY, Hamburg, Germany, ) 5th - 8th April, 2013
7. Srivastava, Sanjeev Kumar - International Conference (Seattle, WA, USA, ) 23rd - 28th June, 2013
8. Panigrahi, Kamal Lochan - Research (International Centre for Theoretical Physics (ICTP), Trieste, ) 75 days
9. Roy Chaudhuri, Partha - Invited Talk in JSA-OSA Symposium (Doshishya University, Kyoto Japan, ) September 16-20, 2013
10. Das, Amal Kumar - Collaborative research work (Jahannes Kepler University (JKU) Linz, Austria, ) March to December 2013
11. Roy, Anushree - visting with ICTP TRIL fellowship (CNR, Pisa Italy, ) 27 days
12. Taraphder, Arghya - Academic (Michigan State University, ) May 28 - June 28, 2013
13. Dhar, Achintya - Invited talk in Indo-US workshop on Organic Solar Cells (National Renewable Energy Centre, Colorado,USA, ) June 24-26

14. Ray, Samit Kumar - To deliver an Invited talk in INSA-Leopoldina Symposium ( Halle, Germany, ) 24/11/13 - 27/11/13
15. Ray, Samit Kumar - Research collaboration (Leibnitz University, Hannover, Germany, ) 27/11/13 - 28/11/13
16. Ray, Samit Kumar - To deliver an invited lecture (Johan Kepler University Linz, Austria, ) 29/11/13 - 30/11/13
17. Ray, Samit Kumar - Carrying out Synchrotron based experiments at DESY (Humburg, Germany, ) 4/4/13 - 10/4/13

### Invited Lectures by Faculty Members

1. Photonic Crystals: Periodic Interaction of Light with Matter *by* Roy Chaudhuri, Partha (HNPEED-2013, Mat Sc, IIT Kharagpur)
2. Basics of Optical Fiber based Sensors *by* Roy Chaudhuri, Partha (NSSFTM-2013, HiTech College of Engineering)
3. Analysis of Complex and Arbitrary Structure Optical Waveguides & Fibers *by* Roy Chaudhuri, Partha (Nanophotonics Workshop, Calcutta University)
4. A New Algorithm to Analyse Complex and Arbitrary Structure Optical Waveguides, Fibers, Fiber Devices *by* Roy Chaudhuri, Partha (PAOMP-2014, ITER, Bhubaneswar)
5. Introduction to the Principles and Applications of Fiber Optic Sensors *by* Roy Chaudhuri, Partha (OFCS-2014, Kolaghat Engineering College)
6. Finite difference Mode Convergence Algorithm to Analyse Complex and Arbitrary Optical Waveguides, Fi *by* Roy Chaudhuri, Partha (INDO-UK Workshop, IIT Delhi)
7. Photonics Crystals & Photonics Sensors *by* Roy Chaudhuri, Partha (Workshop on Materials Science, University of Burdwan)
8. Designing Microstructured Optical Fiber towards High-Performance Fiber Amplifier *by* Roy Chaudhuri, Partha (ICOL-2014, IRDE, Dehradun)
9. Dispersion Engineering towards Ultra Broadband Supercontinuum generation in Soft glass based High-In *by* Roy Chaudhuri, Partha (JSAP-2013, Doshisha University, Kyoto, Japan)
10. High-Performance Erbium-doped Fiber Amplifier and Fiber Laser in PCF Host *by* Roy Chaudhuri, Partha (NLS-22, Manipal University, Karnataka)
11. Submicron-size high-index-core Bragg fiber with high nonlinearity *by* Roy Chaudhuri, Partha (WRAP-2013, IIT Delhi)
12. Interface Effect on Magnetoresistance of Ferromagnet/Semiconductor Heterostructure *by* Das, Amal Kumar (International Conference PSI2014 in Puri, Odisha)
13. Seeing the Universe with Redshifted 21-cm Radiation *by* Bharadwaj, Somnath (Presidency University, Kolkata)
14. Eddington inspired Born-Infeld gravity *by* Kar, Sayan (IIT Kanpur)
15. A century of extra dimensions (colloquium) *by* Kar, Sayan (IIT Kanpur)
16. Transverse polarization structure of an optical vortex beam in a birefringent crystal *by* Manoj, Brundavanam Maruthi (IIST, Trivandrum)
17. Physics of PLD grown epitaxial TiN(Ni)/p-Si heterojunction *by* Nath, Tapan Kumar (DAE-BRNS 7th National Symposium on Pulsed Laser Deposition of Thin Films and Nanostructured Materials, IIT Kharagpur (PLD-2013))
18. Radiation Sensing Properties of Metal oxide Thin Films *by* Sharma, Shivcharan Lal (Kanpur University)
19. Roughening and smoothing in electronic growth of Ag on Si(111)-7x7 surfaces *by* Goswami, Dipak Kumar (Puri, India)
20. Enhanced magnetocaloric effect in Sm<sub>0.55</sub>Sr<sub>0.45</sub>MnO<sub>3</sub> phase separated manganites *by* Nath, Tapan Kumar (International conference on functional materials (ICFM-2014, 5 - 7 Feb. 2014), Materials science centre, IIT Kharagpur)
21. Nanostructured Magnetic oxides *by* Nath, Tapan Kumar (Vidyasagar University, V.U., Midnapore)
22. Rotating thermal convection *by* Kumar, Krishna (Viswabharati, Santiniketan)

23. Physical Curl Forces *by* Shukla, Pragma (SN Bose center for Basic Sciences, Kolkata)
24. Complex Systems with Goldstone conditions: a statistical view point *by* Shukla, Pragma (Indian Institute of Science, Bangalore)
25. System dependent random matrix ensembles: a single parametric formulation *by* Shukla, Pragma (Department of Physics, IIT Indore)
26. Protein folding at single-molecule level *by* Gupta, Amar Nath (Bhubaneswar)
27. Nano-oxides for energy applications *by* Chandra, Amreesh (TU Braunschweig, Germany)
28. Semiconductor Nanomaterials  
as Probed by Inelastic Light Scattering *by* Roy, Anushree (NIT Durgapur)
29. III-V Semiconductor Nanowires of Wurtzite Phase  
as Probed by Inelastic Light Scattering  
*by* Roy, Anushree (Brescia, Italy)
30. *by* Taraphder, Arghya (MSU, USA. IIT Roorkee and many other places)
31. Nanostructure influence in transport processes through hetero-interfaces of organic cells *by* Dhar, Achintya (NREL, Colorado, USA)
32. Role of nanostructures for higher efficiencies in organic solar cells *by* Dhar, Achintya (IIT Kanpur)
33. Silicon Hybrid Nanostructures for Electronic and Photonic Devices *by* Ray, Samit Kumar (German Academy of Sciences, Halle, Germany)
34. Optical and Electrical Characteristics of Strained Ge Films / Nanostructures *by* Ray, Samit Kumar (Johan Kepler University Linz, Austria)
35. Light Emission and Charge Storage Characteristics of Ge Nanostructures *by* Ray, Samit Kumar (Leibnitz University, Hannover, Germany)
36. Optical Properties of Semiconductor Hetero- and Nanostructures Grown by Pulsed Laser Deposition *by* Ray, Samit Kumar (IIT Kharagpur)
37. Functional Devices using Low Dimensional Semiconductor Structures *by* Ray, Samit Kumar (Shiv Nadar University, Noida)
38. Structural and Optical Characteristics of Strained Ge Nanostructures *by* Ray, Samit Kumar (Puri)
39. Silicon Based Hybrid Nanostructures for Device Applications *by* Ray, Samit Kumar (IIT Bombay)
40. Silicon Germanium Heterostructures for Electronic & Photonic Devices *by* Ray, Samit Kumar (NIT Durgapur)
41. Silicon Based Nanophotonic Devices : Status & Trends *by* Ray, Samit Kumar (Bhubaneswar)

### ***Books Published***

1. Maruthi M Brundavanam, Y. Miyamoto, M. Takeda and K. Nakagawa: FRINGE 13 (One Chapter, pp. 611-615) *published by* Springer (2014)
2. Rajkumar Singha and Samit K. Ray: Book Chapter : "Silicon-Based Detectors and Sources for Optoelectronic Devices" in "Guided Wave Photonics" *published by* CRC Press, USA (2013)
3. Samudra Roy, Debashri Ghosh and S.K. Bhadra: Guided wave optics and photonics devices (Chapter 15) *published by* Taylor & Francis Group (2013)

### ***Papers Published in Journals***

1. A Facile Route for the Synthesis of Nanotubular Composite of Polyaniline with Cobalt and its Superparamagnetism below Blocking Temperature *By* K. Gupta, P. T. Das, T. K. Nath, A. K. Meikap, P. C. Jana *POLYMER COMPOSITES*, 8 March, DOI10.1002 (2014)
2. A Griffiths-like phase in antiferromagnetic  $R_{0.5}Eu_{0.5}MnO_3$  ( $R = Pr, Nd, Sm$ ), *By* A Karmakar, S Majumdar, S Kundu, T. K. Nath and S Giri, *J. Phys.: Condens. Matter* 25 , 066006. (2013)

3. A preformed excitonic liquid route to charge density wave in 2H-TaSe<sub>2</sub> By A.Taraphder, S. Koley, N. S. Vidhyadhiraja and M. Laad *Phys. Rev. Lett.* 106, 236405 (2011)
4. An investigation of low temperature electronic phase arrest and glassy ferromagnetic phase in Sm<sub>0.55</sub>Sr<sub>0.45</sub>MnO<sub>3</sub> phase separated manganite, By S. K. Giri and T. K. Nath, *Journal of Applied Physics* 115 , 053902 (2014)
5. Angular Momentum Transfer in Interaction of Laguerre-Gaussian Beams with Atoms and Molecules By Pradip Kumar Mondal, Bimalendu Deb, and Sonjoy Majumde *arxiv* :1403.2881 (2014)
6. Anomalous magnetic behavior below 10 K in YCrO<sub>3</sub> nanoparticles obtained under droplet confinement By Inderjeet Singh, K. Lanfester, R. Espi, A.K. Nigam and Amreesh Chandra *Applied Physics Letters* 103, 182902 (2013)
7. “Improvement of the nanostructured zinc oxide/polymer based solar cell efficiency through the incorporation of N,N’- Dioctyl-3,4,9,10-perylenedicarboximide (PTCDI-C8) nanoribbons as charge mediator□? By S. Pradhan and A. Dhar *Synthetic Metals* 176, p116-120 (2013)
8. Broadband photoresponse and rectification of novel graphene oxide/n-Si heterojunctions By R. Maiti, S. Manna, A. Midya, and S. K. Ray *Optics Express* 21, 26035 (2013)
9. Broadband Supercontinuum Generation in Ultra-flat near zero Dispersion PCF with Selective Liquid Infiltration By Partha Sona Maji and Partha Roy Chaudhuri *Journal of Photonics and Optoelectronics* 1072, 2304-1064 (2013)
10. Chemically Reduced Graphene Oxide for Ammonia Detection at Room Temperature By R. Ghosh, A. Midya, S. Santra, S. K. Ray, and P. K. Guha, “ *ACS Appl. Mater. Interfaces* 15, pp. 7599-7603 (201)
11. Circular Photonic Crystal Fibers: Numerical Analysis of Chromatic Dispersion and Losses By Partha Sona Maji and Partha Roy Chaudhuri *ISRN Optics* 2013, ID 986924 (2013)
12. Collective and noncollective excitations in 122Te By Somnath Nag, A.K. Singh, I. Ragnarsson, H. Huebel, A. Al-Khatib, P. Bringel, C. Engelhardt, A. Neusser-Neffgen, G.B. Hagemann, B. Herskind, G. Sletten, M.P. Carpenter, R.V.F. Janssens, T.L. Khoo, T. Lauritsen et al. *Physical Review C* 88, 044335 (2013)
13. Confinement and focusing of geodesics in warped spacetimes By Sayan Kar, Anirvan DasGupta, Suman Ghosh and Hemwati Nandan *J.Phys.Conf.Ser. (refereed conference proceedings)* 484 , 012019 (2014)
14. Correlation between the mechanical and magneto-transport properties of cobalt film on semiconducting substrate By A. Sarkar, R. Adhikari, A. K. Das *Physica B* 407, 4148 (2012)
15. Critical behavior and magnetic relaxation dynamics of Nd<sub>0.4</sub>Sr<sub>0.6</sub>MnO<sub>3</sub> nanoparticles, By S. Kundu and T. K. Nath, *Philosophical Magazine*, 93, 2527 (2013)
16. Defect-induced Room Temperature Ferromagnetism in SnO<sub>2</sub> Nanowires Controlled by UV Light Irradiation By Sudipta Bhaumik, Arun Kumar Sinha, Samit K. Ray and Amal Kr. Das, “ *IEEE Transactions on Magnetism* DOI 10.1109/TMAG.201 (2014)
17. Defects in 6 MeV H<sup>+</sup> irradiated hydrothermal ZnO single crystal By A. Sarkar, M. Chakrabarti, D. Bhowmick, A. Chakrabarti, S. K. Ray, D. Rafaja and D. Sanyal *J. Phys.:* *Condens. Matter* 25, 385501 (2013)
18. Defects in 700 keV oxygen ion irradiated ZnO□? By S. Pal, A. Sarkar, S. Chattopadhyay, M. Chakrabarti, D. Sanyal, P. Kumar, D. Kanjilal, T. Rakshit, S.K. Ray and D. Jana *Nuclear Instruments and Methods in Physics Research B* 311, 20–26 (2013)
19. Development of a high vacuum cantilever beam magnetometer for measurement of mechanical and magnetic properties of thin films By A. Sarkar, R. Adhikari and A. K. Das *CURRENT SCIENCE, VOL. 104, NO. 7, 10 APRIL 2013* 104, 826 (2013)
20. Direct band gap optical emission from compressively strained Ge films grown on relaxed Si<sub>0.5</sub>Ge<sub>0.5</sub> substrate By R. Aluguri, S. Manna, and S. K. Ray *Applied Physics Letters* 103, 161118 (2013)
21. Direct band gap optical emission from Ge islands grown on relaxed Si<sub>0.5</sub>Ge<sub>0.5</sub>/Si (100) substrate By R. Aluguri, S. Manna, and S. K. Ray *J. Appl. Phys.* 115, 013502 (2014)
22. Dispersion properties of the square-lattice elliptical-core PCFs By Partha Sona Maji and Partha Roy Chaudhuri *American Journal of Optics and Photonics* 2(1), pp. 1-6 (2014)

23. Distribution of Protein Ramachandran Psi ( $\psi$ ) Angle Using Non- Resonance Visible Raman Scattering Measurements By Susmita Bhattacharya, Sudeshna Ghosh, Nitin Kumar Pandey, Susmitnarayan Chaudhury, Swagata Dasgupta, and Anushree Roy *The Journal of Physical Chemistry B* 117, 13993 (2013)
24. E1- PNC transition amplitudes of the hyperfine components for  $^{2}S_{1/2}$   $^{2}D_{3/2}$  transitions of  $^{137}\text{Ba}^{+}$  and  $^{87}\text{Sr}^{+}$  By Narendra Nath Dutta and Sonjoy Majumder *Physical Review A (Accepted)*, arxiv: 1404.2020 (2014)
25. Effect of Mn doping on magnetic and transport properties of  $\text{Nd}_{0.5}\text{Sr}_{0.5}\text{Co}_{1-y}\text{Mn}_y\text{O}_3$  ( $y = 0, 0.1, 0.3, 0.9, 0.95$  and  $1$ ), By S. Kundu and T. K. Nath, *Journal of Magnetism and Magnetic Materials*, 325, 1–6, (2013)
26. Effect of site disorder on the electronic properties of  $\text{Fe}_2\text{VAl}$  Heusler alloy By Ch. Venkatesh, V. Srinivas, V.V. Rao, S.K. Srivastava, and P. Sudheer Babu *Journal of Alloys and Compounds* Vol. 577, Page 417 (2013)
27. Electric quadrupole and magnetic dipole interactions at 181Ta impurity in  $\text{Zr}_2\text{Ni}_7$  intermetallic compound: Experiment and first-principles calculations By C.C. Dey, S.K. Srivastava *Physica B* Vol. 427, page 126 (2013)
28. Electroluminescence from metal- insulator-semiconductor tunneling diodes using compressively strained Ge on  $\text{Si}_{0.5}\text{Ge}_{0.5}$  virtual substrates By S. Manna, R. Aluguri, S. Das, R.K. Singha and S.K.Ray *Optics Express* 21, pp. 28219-28231 (2013)
29. Electronic band structure of wurtzite GaP nanowires via temperature dependent resonance Raman spectroscopy By Jaya Kumar Panda, Anushree Roy, Mauro Gemmi, Elena Husanu, Ang Li *Applied Physics Letters* 103, 023108 (2013)
30. Emergence of Griffiths phase and glassy mixed phase in  $\text{Sm}_{0.5}\text{Ca}_{0.5}\text{MnO}_3$  nanomanganites, By S. K. Giri, S. Mukadam, S. Yusuf, T. K. Nath, *Journal of Alloys and Compounds*, 591, 181 (2014)
31. Enhanced exchange bias effect in size modulated  $\text{Sm}_{0.5}\text{Ca}_{0.5}\text{MnO}_3$  phase separated manganite, By S. K. Giri, S. M. Yusuf, M. D. Mukadam and T. K. Nath, *Journal of Applied Physics*, 115 , 093906 (2014)
32. Enhanced Magnetocapacitance and Dielectric property of Multiferroic  $\text{Co}_{0.65}\text{Zn}_{0.35}\text{Fe}_2\text{O}_4\text{-PbZr}_{0.52}\text{Ti}_{0.48}\text{O}_3$  Magnetodielectric composites, By P. R. Mandal and T. K. Nath, *Journal of Alloys and Compounds* 599, 71 (2014)
33. Enhanced temperature dependent junction magnetoresistance in  $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3 / \text{Zn}(\text{Fe},\text{Al})\text{O}$  carrier induced dilute magnetic semiconductor junctions, By S Chattopadhyay, J. Panda, T. K., Nath, *Journal of Applied Physics* 113 (19), 194501 (2013)
34. Entropy and energy spectra in low-Prandtl-number convection with rotation By Hirdesh K. Pharasi, Krishna Kumar, and Jayanta K. Bhattacharjee *Physical Review E* Vol. 89, 023009 (2014)
35. Exchange bias effect concerned with tunneling magnetoresistance in  $\text{Sm}_{0.35}\text{Pr}_{0.15}\text{Sr}_{0.5}\text{MnO}_3$  phase separated manganites, By S. K. Giri, Proloy. T. Das, S. K. Hazra, T. K. Nath, *IEEE Transactions on Magnetics* 50, 2000504 (2014)
36. Exploring low temperature  $\text{Li}^+$  ion conducting plastic battery electrolyte By Avirup Das, Awalendra K. Thakur and K. Kumar *Ionics* Vol. 19, 1811–1823 (2013)
37. Fabrication of N,N'-dioctyl-3,4,9,10-perylenedicarboximide nanostructures through solvent influenced  $\pi$ - $\pi$  stacking and their morphological impact on photovoltaic performance By S. Pradhan, J. Redwine, J.T. McLeskey Jr., A. Dhar *Thin Solid Films* j.tsf.2014.03.035 (2014)
38. Field induced ferromagnetic phase transition and large magnetocaloric effect in  $\text{Sm}_{0.55}\text{Sr}_{0.45}\text{MnO}_3$  phase separated manganites, By S. K. Giri, A. Poddar and T. K. Nath, *Journal of Alloys and Compounds* , 582, 609 (2014)
39. Field-induced magnetic phase transition in  $\text{Pr}^{3+}$  doped  $\text{Sm}_{0.5}\text{Sr}_{0.5}\text{MnO}_3$  manganites, By S. K. Giri and T. K. Nath, *Journal of Applied Physics*, 113, 17D706 (2013)
40. First principles density functional calculation of magnetic moment and hyperfine fields of dilute transition metal impurities in Gd host By S.K. Mohanta, S.N.Mishra and S.K.Srivastava *Journal of Magnetism and Magnetic Materials* Vol. 355, Page 142 (2014)

41. Geometrical parameters dependence towards ultra-flat dispersion square-lattice PCF with selective liquid infiltration By Partha Sona Maji and Partha Roy Chaudhuri *American Journal of Optics and Photonics* 1(5), pp. 28-32 (2013)
42. Giant junction magnetoresistance effect in ferromagnet/semiconductor heterostructures By Anirban Sarkar, Rajdeep Adhikari, and Amal Kumar Das *JOURNAL OF APPLIED PHYSICS* 114, 154513 (2013)
43. Graphite oxide/polypyrrole composite electrodes for achieving high energy density supercapacitors By Arvinder Singh and Amreesh Chandra *Journal of Applied Electrochemistry* doi:10.1007/s10800-0 (2013)
44. High-spin spectroscopy of  $^{140}\text{Nd}$  By R. Leguillon et al. *Physical Review C* 88, 014323 (2013)
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  46. Optical and magnetic properties of Co doped ZnO-ZnS core-shell nanorods, By S. Bhaumik, A. K. Sinha, S. K. Ray A. K. Das, *IUMRS-International Conference in Asia (IUMRS-ICA 2013)*, IISc Bangalore, (2013)
  47. Optical Properties of Semiconductor Hetero- and Nanostructures Grown by Pulsed Laser Deposition, By Samit K Ray (Invited Talk), *7th DAE-BRNS National Symposium on Pulsed Laser Deposition*, IIT Kharagpur, (2013)

48. Organic Nanostructures for Photovoltaic Applications, By A. Dhar and S. Pradhan, *17th International Workshop on The Physics of Semiconductor Devices (17th IWPSD)*, Amity University, Noida, 2011, UP, INDIA, (2013)
49. Patterning of gold nanoparticles using electron beam lithography defined array of trenches in PMMA on silicon, By Subhendu S Sarkar, A. Rudra, R. K. Khatri, A. Katiyar, Narendar G, Arun Sinha, S. K. Ray, *6th International conference on Nano Science and Technology (ICONSAT 2014)*, Chandigarh, (2014)
50. Performances of ring-shaped cladding structured PCF laser and triangular lattice PCF laser, By Kajal Mondal and Partha Roy Chaudhuri, *WRAP-2013 held at IIT Delhi*, IIT Delhi, (2013)
51. Physics of PLD grown epitaxial TiN(Ni)/p-Si heterojunction,, By T. K. Nath,, *DAE-BRNS 7th National Symposium on Pulsed Laser Deposition of Thin Films and Nanostructured Materials (PLD-2013)*, IIT Kharagpur,, (2013)
52. Plasmonic enhancement of optical properties of ZnO-Ag nanostructured thin films for photonic applications, By Arijit Sarkar, Narendar Gogurla, B. N. Shivakiran Bhaktha and Samit K Ray, *Intl. Conf. on optics and optoelectronics (ICOL-2014)*, IRDE, Dehradun, (2014)
53. Probing the effect of grain size on transport, and magnetic properties of Pr<sub>0.7</sub>Sr<sub>0.3</sub>MnO<sub>3</sub> nanoparticles, By P. T. Das, S. K. Giri, A. Taraphder and T. K. Nath, *3rd international Symposium on Advanced Magnetic Materials and Applications (ISAMMA- 2013)*, Taichung, Taiwan, (2013)
54. Probing the magnetic state in nanoparticles of antiferromagnetic Nd<sub>0.4</sub>Sr<sub>0.6</sub>MnO<sub>3</sub>., By S. Kundu and T. K. Nath, *Proceedings of ISJPS 2013, page 145 (2013)*, held in IIT KGP, (2013)
55. Radiation Sensing Properties of Metal Oxide Thin Films, By S. L. Sharma, *NCTP-2013 7th Nat Conf on Thermo Physical Properties*, Kanpur University, (2013)
56. Role of oxygen vacancies in magnetic properties of LaAlO<sub>3</sub>/SrTiO<sub>3</sub> interface, By N. Mohanata and A. Taraphder, *AIP Conf. Proc. 1591, 1513 (2014)*, , (2014)
57. Room temperature giant positive magnetoresistance of NiFe<sub>2</sub>O<sub>4</sub>/n-Si heterojunction for spintronics application, By J. Panda, S. N. Saha, and T. K. Nath,, *International Conference on Magnetic Materials and Applications (Magma-2013)*, IIT Guwahati,, (2013)
58. Rotating thermal convection, By Krishna Kumar, *Recent Perspectives on Nonlinear Mathematics and its Applications (RPNMA-2014)*, Department of Mathematics, Visva-Bharati, (2014)
59. Selective Gas Sensing on Graphene Platform, By Anupam Midya, Narendar Gogurla, Arun Kumar Sinha, Sumita Santra, Samit K Ray, *IUMRS-International Conference in Asia (IUMRS-ICA 2013)*, IISc Bangalore, (2013)
60. Semiconductor Nanomaterials as Probed by Raman Scattering, By Anushree Roy, *FCS 2014*, IISc Bangalore, (2013)
61. Si<sub>1-x</sub>Gex nanocrystals embedded in epitaxial Gd<sub>2</sub>O<sub>3</sub> on p-Si (111) grown by molecular beam epitaxy for nanocrystal based flash memory devices, By R. Bar, S. Manna, A. Laha, H. J. Osten, and S. K. Ray, *IUMRS-International Conference in Asia (IUMRS-ICA 2013)*, IISc Bangalore, (2013)
62. Silicon Based Hybrid Nanostructures for Device Applications, By Samit K.,Ray (Invited Talk), *7th India-Singapore Symposium Experimental Condensed Matter Physics*, IIT Bombay, (2014)
63. Single Si nanowire near infra-red photodetector with high responsivity and large polarization selectivity, By Kaustuv Das, Subhrajit Mukherjee, Santanu Manna, S.K Ray, A. K. Raychauduri, *6th International conference on Nano Science and Technology (ICONSAT 2014)*, Chandigarh, (2014)
64. Size induced magnetic behavior in Nd<sub>0.4</sub>Sr<sub>0.6</sub>MnO<sub>3</sub> nanoparticles., By S. Kundu and T. K. Nath,, *International Conference on Magnetic Materials and Applications (Magma-2013)*, IIT Guwahati,, (2013)

65. Smooth Supercontinuum Generation in a Dispersion-Flattened Nonlinear High-Index-Core Bragg Fiber, *By* Sudip Kumar Chatterjee, Saba N. Khan and P. Roy Chaudhuri, *WRAP-2013 held at IIT Delhi*, IIT Delhi, (2013)
66. Spin reorientation and magnetodielectric effect in Gd-substituted  $\text{YFe}_{0.6}\text{Mn}_{0.4}\text{O}_3$ , *By* P. R. Mandal and T. K. Nath, *Proceedings of ISJPS 2013*, page 134 (2013), held in IIT Kharagpur, (2013)
67. Strain induced first order magnetic phase transition in epitaxial  $\text{Sm}_{0.55}\text{Sr}_{0.45}\text{MnO}_3$  thin film,, *By* S. K. Giri, P.T. Das and T. K. Nath,, *DAE-BRNS 7th National Symposium on Pulsed Laser Deposition of Thin Films and Nanostructured Materials (PLD-2013)*, IIT Kharagpur, (2013)
68. Structural and Magnetization Behavior of Highly Spin Polarized  $\text{Co}_2\text{CrAl}$  Full Huesler Alloy,, *By* S. N. Saha, J. Panda and T. K. Nath, *Proceedings of ISJPS 2013*, page 109 (2013), held in IIT KGP, (2013)
69. Structural and Optical Characteristics of Strained Ge Nanostructures, *By* Samit K Ray (Invited Talk), *3rd International Conference on Physics at Surface and Interfaces (PSI2014)*, Puri, (2014)
70. Structural parameters dependence towards ultra-flat dispersion square-lattice PCF with selective liquid infiltration, *By* Partha Sona Maji and Partha Roy Chaudhuri, *ICOL-2014 at IRDE, Dehradun*, Dehradun, (2014)
71. Studies on Nonlinear Electrical Transport and Magnetoresistance in Co/CoO Core-Shell Nanostructure, *By* A. Sarkar, N. Behera, R. Adhikari and A. K. Das, *AIP Conf. Proc. 1447*, 937, , (2012)
72. Swift heavy ion induced nano-dimensional phase separation in liquid immiscible binary Mn–Bi, *By* S.K. Srivastava, P. Sudheer Babu, S.A. Khan and D.K. Avasthi, *21st International Conference on Ion Beam Analysis (IBA 2013)*, Seattle, WA, USA, (2013)
73. Synthesis of ZnO nanorod arrays by wet chemical method (CBD), *By* I. Sasmal, D. Pradhan, and T. K. Nath,, *Proceedings of ISJPS 2013*, page 57 (2013), IIT KGP (2013)., (2013)
74. Temperature dependent current – voltage characteristics of  $\text{Co}_{0.65}\text{Zn}_{0.35}\text{Fe}_2\text{O}_4/\text{n-Si}$  magnetic diode like structure,, *By* A. Santosh kumar, J Panda and T. K. Nath,, *National Seminar on Recent Trend in Condensed Matter Physics*, ITER, SOA University, Bhubaneswar, (2014)
75. Temperature dependent giant positive Magnetoresistance in  $\text{Co}_{0.65}\text{Zn}_{0.35}\text{Fe}_2\text{O}_4/\text{p-Si}$  heterostructure magnetic Diode for Spintronics,, *By* J. Panda and T. K. Nath,, *Proceedings of ISJPS 2013*, page 144 (2013), held in IIT KGP, (2013)
76. The ground states of Perovskite nickelates: A dynamical mean field approach, *By* D. Misra and A. Taraphder, *AIP Conf. Proc. 1591*, 1297 (2014), , (2014)

## Advanced Technology Centre

### **Head**

Prof. Sunando DasGupta

### **Professor**

Roy, Jatindra Nath ,

### **Senior Scientific Officer**

Gangopadhyay, Pranabendu , Microphotonics, Microstructuring & MOEMS, Integrated Optics, Fiber Optics

### **Awards & Honours**

1. Gangopadhyay, Pranabendu (2012) *Certificate of Appreciation was awarded by SPIE, USA, for serving as a reviewer for the journal Optical Engineering.*

### **Sponsored Research Projects**

1. Development of SU-8 based microstructures for integrated-optic and bio-applications (ISIRD, IIT Kharagpur, Rs.5.00 Lakhs)

### **Papers Published in Journals**

1. A technical report on fabrication of SU-8 optical waveguides By P.K. Dey and P. Ganguly *Journal of Optics*, 10.1007/s12596-013-0144-y, (2013)
2. Construction and generation of OCDMA code families using a complete row-wise orthogonal pairs algorithm By M. Ravi Kumar, P. Ganguly, S.S. Pathak, and N.B. Chakrabarti, *AEÜ - International Journal of Electronics and Communications* 67, pp.868-874 (2013)
3. Theoretical Estimation of Refractive Index of Continuous Wave UV Induced Waveguide in LiNbO<sub>3</sub> Considering Temperature Dependent Absorption Coefficient By T. Ghosh, B. Samanta, P.C. Jana, and P. Ganguly, *IEEE/OSA Journal of Lightwave Technology* Vol.31,pp.2728-2734, (2013)

### **Papers Presented in Conferences**

1. Design of CW direct UV-written waveguides in LiNbO<sub>3</sub> to retain its full electro-optic property,, By T. Ghosh, B. Samanta, P.C. Jana, and P. Ganguly,, *37th National Symposium of Optical Society of India*,, Pondicherry,, (2013)
2. Design of single mode LiNbO<sub>3</sub> photonic wires and estimation of its bending losses for different bending radii., By P. Ganguly, *International Conference on Fiber Optics and Photonics, Photonics-2012.*, Channei, India., (2012)

## Centre for Educational Technology

### **Head**

Prof. Bani Bhattacharya

### **Professor**

Ray, Anup Kumar ,

### **Associate Professor**

Bhattacharya, Bani *Ph.D.(IIT Kharagpur)*, Instructional Design Distance Education  
Technology Enhanced Learning Pedagogical Research

### **Assistant Professors**

Bhowmick, Plaban Kumar *Ph.D.(IIT Kharagpur)*, Natural Language Processing in Education,  
Artificial Intelligence in Education, Computer Aided Education

Das Mandal, Shyamal Kumar *Ph.D.(Jadavpur Univ)*, Speech and Signal Processing

Mohanty, Atasi *Ph.D.(Utkal University)*, Cognitive Psychology Human Resource  
Development Health & Counselling Psychology, Educational  
Psychology Teacher Education

### **Faculty Appointments**

Plaban Kumar Bhowmick Assistant Professor

### **Visiting Faculty**

Prof. A.K. Ray Ph.D Educational Technology; Video  
Systems Engg

### **Faculty Retirement**

Anup Kumar Ray Professor

### **Faculty Re-employment**

Bani Bhattacharya Associate Professor

### **New Academic Programmes**

M Tech in Multimedia Information Processing

### **Brief Description of on-going activities**

CET, IIT Kharagpur is offering an M.Tech Programme on “Multimedia Information Processing”. Students with B.Tech./B.E. or equivalent qualification in CSE/ECE/EE/Instrumentation Engineering /IT are eligible to apply. CET also offers Ph.D and M.S. programmes in both, areas related to educational pedagogy and in Speech and Image processing. Research scholars are already working in these areas. 11 research scholars are already working in the area of Educational Technology and Speech Processing. M.Tech programme for teachers of AICTE affiliated institutions and industry are being offered through videoconferencing mode at 3 studios in CET.



Ongoing Sponsored Projects : 1) National Program on Technology Enhanced Learning - CET, IIT Kharagpur has already developed more than 200 courses as a part of NPTEL phase I & II. 2) Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning. 90 courses have been completed in the pilot phase. The main phase program with objective of development of 200 courses has been started. These courses consist detailed curriculum documents with instructional objectives, assessment and references to learning resource materials. 3) Creation of Integrated Development Environment (IDE) for Generation of Pronunciation Lexicon for Indian Languages (PL-IL) in W3C Pronunciation Lexicon Standard (PLS) and Example lexicon in Hindi and Bangla Languages 4) Language Technology for E-learning Applications

### ***Thrust Areas***

1. The center has produced nearly 4,800 hours of video courses in various engineering subjects. These are in use in more than 250 engineering colleges, universities and R & D laboratories. These courses are primarily used for self-learning by faculty, staff and students. Significant demand for them exists in overseas markets also. CD & DVD versions of these courses are available. CET is now also making the courses available on HDDs – to be used in the Video-on-Demand (VOD) mode by institutions within their internal LAN. This allows access to any course on the LAN to a large number of users at any point of time along with the ability to control all normal play functions at will. More than 3700 users access these courses on any single day within the LAN of IIT Kharagpur.
2. Instructional Design; Technology Enhanced Learning; Teaching-Learning Process; Distance Education; Speech and Image processing; Speech Technology development for Indian Language and ICT application; Cognitive Psychology & Human Resource Development; E-learning; Natural Language Processing for e-Learning; Artificial Intelligence in Education;

### ***New Acquisitions***

1. The video studios are being updated to HD (High definition) system and as a result new set of instruments like camera, switcher etc are being installed.
2. Upgradation of M Tech software laboratory; Upgradation of project laboratory; Installation of new pedagogy server

### ***Lectures by Visiting Experts***

1. Massive Open Online Courses by Prof. Michael Lightner (University of Colorado)
2. Speech Prosody by Prof. Keikechi Hiroshi (Prof. Univ of Tokyo)

### ***Doctoral and MS Degrees Awarded***

1. Richa Anil Rastogi Mittal : Factors Influencing Students' Performance in Engineering Education in India(Ph D)

### ***Member - Professional Bodies***

1. Mohanty, Atasi, *Life Member- No.1232* - Indian Academy of Applied Psychology
2. Mohanty, Atasi, *Life Member* - Indian Association of Health Research & Welfare
3. Mohanty, Atasi, *Regular Member up to 2016* - National Academy of Psychology
4. Das Mandal, Shyamal Kumar, *Member* - International Speech Communication Association
5. Bhattacharya, Bani, *Regular* - International Forum of Educational Technology and Society
6. Bhattacharya, Bani, *member* - Technical Programme Committee, T4E, IEEE Hyderabad
7. Bhattacharya, Bani, *Associate* - Board of experts in E-Learning Forum and Distance Education, Commonwealth of Learning

8. Bhattacharya, Bani, *Regular* - Expert committee on Distance education & e-Learning for the Asian Productivity Organization, (APO) Tokyo
9. Bhattacharya, Bani, *Regular* - Indo US Collaboration for Engineering Education (IUCEE)
10. Bhattacharya, Bani, *Member* - Technical Programme Committee, T4E, IEEE Chennai

#### ***Member - Editorial Board***

1. Bhattacharya, Bani (2013) *Committee Member* - The 7th European Conference on Games Based Learning (ECGBL13)
2. Bhattacharya, Bani (2011) *Member, Editorial Advisory Board* - Higher Education Institutions and Learning Management Systems: Adoption and Standardization
3. Bhattacharya, Bani (2010) *Member, Technical Programme Committee* - International Conference on Technology for Education 2010 (IEEE)
4. Bhattacharya, Bani (0) *Member and Reviewer* - IEEE Techsym
5. Bhattacharya, Bani (2011) *Member and reviewer* - ICALT 2011

#### ***Awards & Honours***

1. Das Mandal, Shyamal Kumar (2013) *Best Student paper awards COCODA 2013 by MS student Sankar Mukherjee*

#### ***Sponsored Research Projects***

1. A Multi-modal and ICT based Intervention Programme for removing Specific Learning Difficulties among Children (Indian Council of Social Science Research- MHRD India, Rs.0.00 Lakhs)
2. Creation of IDE for Generation of Pronunciation Lexicon for Indian Languages (PL-IL) in W3C Pronunciation Lexicon Standard (PLS) and Example lexicon i (Department of Information Technology, Rs.47.26 Lakhs)
3. Creation of Integrated Development Environment (IDE) for Generation of Pronunciation Lexicon for Indian Languages (PL-IL) in W3C Pronunciation Lexicon (DIT, Rs.47.00 Lakhs)
4. Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning (MHRD, Rs.100.00 Lakhs)
5. Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning ICE - main phase (MHRD, Rs.1600.00 Lakhs)
6. Language Technology for E-learning Applications (SRIC, ISIRD grant, Rs.5.00 Lakhs)
7. NPTEL (MHRD, Rs.1133.00 Lakhs)

#### ***Invited Lectures by Faculty Members***

1. Creativity and Innovation *by* Mohanty, Atasi (Deptt of HSS IIT Kharagpur)
2. Outcome-based Curriculum Design *by* Das Mandal, Shyamal Kumar (BIT Misra)
3. Effective Teacher as a Reflective Practitioner *by* Mohanty, Atasi (Allahabad Motilal Nehru NIT)
4. Computer Assisted Spoken Language Learning (CASLL) for L2 Learners: A Study for L1 – Bengali, L2 – E *by* Das Mandal, Shyamal Kumar (AIISH Mysore)

#### ***Papers Published in Journals***

1. Impact of Teacher Competence and Teaching Effectiveness on Students Achievement in Life Science Subjects at Upper Primary Stage *By* S. Banerjee, A.Mohanty, N.Das *Journal of Indian Education* February 2014 (2014)
2. Plan State Representation Using Heterogeneous Data Sources *By* Santa Maiti, Plaban Bhowmick, Debnath Mukherjee *Advances in Smart Systems Research* 3 (2014)

### *Papers Presented in Conferences*

1. Analysis of Occurrence Probability and Duration of Sentence-Medial Pauses in English Readout Speech for L2 English Speakers Compared to L1 English Speakers, *By* Shambhu Nath Saha and Shyamal Kumar Das Mandal, *O'COCOSDA 2013, IEEE Conference*, KIIT College of Engineering,Gurgaon, Ind, (2013)
2. Bengali Parts-of-Speech Tagging using Global Linear Model, *By* S. Mukherjee, S. K. Das Mandal, *IEEE INDICON -2013*, IIT Bombay, (2013)
3. Equal Education, *By* Mittal, R. and Bhattacharya, B, *BTTIC-ICREEH*, Mumbai, (2013)
4. How Quality of Work and Life has been perceived by Indian Employees?, *By* Atasi Mohanty, *Gender & Attractive work: Sweden- India Meet on Strategic Thinking*, TISS Mumbai, (2013)
5. Impact of SOLO Taxonomy in Computer Aided Instruction to Qualitative Outcome of Learning for Secondary School Children., *By* Bhattacharya , T. Bhattacharya, B. Mitra, T, *T4E conference, IEEE,, IIT Hyderabad*, (2012)
6. L1 Bengali Phonological Interference on L2 English - Analysis of Bengali AESOP Corpus, *By* Shambhu Nath Saha and Shyamal Kumar Das Mandal, *Springer LNCS 2013 Volume 8284, 2013, pp 790-798, , (2013)*
7. PL-ILT: A Web Tool fo Creation of Pronunciation Lexicon in Indian Languages, *By* S. Mukherjee, S. K. Das Mandal, *O'COCOSDA 2013, IEEE Conference*, KIIT College of Engineering,Gurgaon, (2013)
8. Prosodic Word And Phrase Boundary Detection Based On F0 Contour Analysis Using Empirical Mode Decomposition, *By* Sudipta Acharya, Shyamal Kumar Das Mandal, *O'COCOSDA 2013, IEEE Conference*, KIIT College of Engineering,Gurgaon, Ind, (2013)
9. Prosody Modeling: A Review Report on Indian Language, *By* Sudipta Acharya, Shyamal Kr.Das Mandal, *LNCS Volume 8284, 2013, pp 790-798, , (2013)*
10. Spirituality & Subjective Well-being, *By* Ms. Atasi Mohanty, *4th International Conference on Integrating Spirituality and Organizational Leadership*, XIMB- Bhubaneswar, (2013)

## Centre for Oceans, Rivers, Atmosphere and Land Sciences

### **Head**

Prof. Arun Chakraborty

### **Associate Professors**

Behera, Mukunda Dev	<i>Ph.D.(IIRS, DehraDun)</i> , Land/ Vegetation Cover and River Basin Dynamics, Biodiversity and Geoinformatics Modeling, Forest Biomass and Carbon Sequestration, Ecosystem Ecology and Climate
Chakraborty, Arun	<i>Ph.D (IIT Delhi)</i> , Ocean Dynamics and Ocean Circulation Modeling of the Bay of Bengal, Data Assimilation
Satyanarayana, Achanta Naga Venkata	<i>Ph.D (BHU)</i> , Observations and Modeling of PBL dynamics and Thunderstorms, Meso-scale Modeling of weather events (Thunderstorms Monsoon), Upper Ocean Response Air Sea Interactions to Tropical Cyclones, Monsoon Meteorology, Air Pollution Modeling

### **Assistant Professors**

Dash, Mihir Kumar	<i>Ph.D. (Gujarat University)</i> , Satellite Oceanography, Mesoscale Ocean Modeling, Cryospheric Studies
Mandal, Manabottam	<i>Ph.D.(IIT Delhi)</i> , Observations and modeling of land surface processes, Modeling of extreme weather events - tropical cyclones and thunderstorms, Regional climate modeling, Cloud Microphysics, Mesoscale and land surface data assimilation
Shaji, C	<i>Ph.D. (IIT Delhi)</i> , Climate Variations, Ocean Modeling and Analysis, Coastal Processes, Monsoon Oceanography

### **Brief Description of on-going activities**

The Centre is established in March 2005 with a vision to impart quality education in Earth System Science & Technology and conduct advance research on the multi-disciplinary aspects of earth and climate sciences with major focus on Land-Ocean-Atmospheric sciences interactions. Since 2006, the centre is offering M.Tech. degree in Earth System Science and Technology. The Centre has been actively participating in various programs of research and application importance at national and international levels. Beside, M.Tech. degree in Earth System Science and Technology the Centre is also offering Ph.D. and MS degrees. The Centre has set its goals, made strategies to meet the goals in phases in corroboration with the Institute's broad vision. The Centre is leading Digital Earth Initiative of the Institute and gearing up for the development of a meso-scale Land-Ocean-Atmosphere coupled model, especially to suitable for Indian sub-continent for better understanding. The Centre aims at being a hub in the Global network of organizations involved in multi-disciplinary earth system studies and research; also contributing to the national development by informing the policymakers of the technological and scientific advancements in the field. The Centre has prepared a visionary road map and planned to execute in stages towards achieving the broad objectives; i.e., excellence in advanced teaching and research in earth system and climate studies.

### **Thrust Areas**

1. Ocean modeling for Bay of Bengal, Indian Ocean and North Indian Ocean
2. Observation and modeling of thunderstorm
3. Modeling and prediction of tropical cyclone
4. Study of Forest Biomass and Carbon Sequestration

5. Monsoon Meteorology
6. Air pollution study
7. Observations and modeling of land surface processes
8. Mesoscale and land surface data assimilation
9. Cloud Microphysics
10. Cryospheric Studies
11. Satellite Oceanography

#### ***Lectures by Visiting Experts***

1. Climate Impacts of Elevated Absorbing Aerosol Layers by Prof. S. K. Satheesh (IISC, Bangalore)
2. Ocean Data Assimilation by Dr. C. Gnanaseelan (IITM Pune)
3. Ocean Information and Services by Dr. M. Ravi Chandran (INCOIS)

#### ***Doctoral and MS Degrees Awarded***

1. Shantanu Kumar Pani : Sources and Radiative Effects of Ambient Aerosols in an Urban Atmosphere in East India(Ph.D.)

#### ***Member - Professional Bodies***

1. Mandal, Manabottam, *Life Member* - Indian Meteorological Society
2. Mandal, Manabottam, *Member* - Asia Oceania Geophysical Society
3. Satyanarayana, Achanta Naga Venkata, *Life Member* - India Meteorological Society, New Delhi
4. Satyanarayana, Achanta Naga Venkata, *Member* - Internatinal Association of Urban Climate (IAUC), USA
5. Dash, Mihir Kumar, *Member* - American Geo-physical Union
6. Chakraborty, Arun, *Life member* - Ocean Society of India
7. Chakraborty, Arun, *Life Member* - Indian Meteorological Society
8. Chakraborty, Arun, *Life Member* - The Indian Science Congress Association
9. Chakraborty, Arun, *Life Member* - Indian Geophysical Union
10. Behera, Mukunda Dev, *Life Member* - Indian Association of Angiosperm taxonomy
11. Behera, Mukunda Dev, *Life Member* - Indian Society of Remote Sensing
12. Behera, Mukunda Dev, *Annual Member* - International Association of Vegetation Science
13. Behera, Mukunda Dev, *Life Member* - Indian Society of Geomatics
14. Behera, Mukunda Dev, *Life Member* - National Institute of Ecology
15. Shaji, C, - *Life Member*: Indian Society of Theoretical and Applied Mathematics
16. Shaji, C, - *Life Member*: Ocean Society of India
17. Shaji, C, *Life Member* - Indian Geophysical Union
18. Shaji, C, - *Life Member*: American Geophysical Union, USA
19. Shaji, C, - *Member*: Japan Oceanographic Society, Japan

#### ***Member - Editorial Board***

1. Chakraborty, Arun (2011) *Reviewer* - Journal of Shipping and Ocean Engineering
2. Chakraborty, Arun (2011) *Associate Editor* - Geoscience Research
3. Satyanarayana, Achanta Naga Venkata (2014) *Guest Editor* - Advances In Atmospheric Sciences

#### ***Awards & Honours***

1. Chakraborty, Arun (2013) *Adjunct Faculty*, IIT Bhubaneswar

2. Behera, Mukunda Dev (2014) *Erasmus Mundus Visiting Scholar*

### ***Sponsored Research Projects***

1. Analysis and simulation of land surface energy balance at a tropical site using INSAT-3D observations (ISRO, Rs.15.30 Lakhs)
2. Climate Change Programme Proposals (CCP-DST)(under process) (DST, Govt. of India, Rs.10.00 Lakhs)
3. Developing Ganga Basin Environment Management Plan-Biodiversity and Ecology Theme (Ministry of Environment and Forests (MOEF), New Delhi, Rs.32.00 Lakhs)
4. Development of a Hybrid Coordinate Ocean Model (HYCOM) for the Bay of Bengal (Indian National Centre for Ocean Information Services (INCOIS), Hyderabad., Rs.0.00 Lakhs)
5. Feature based study of Indian Ocean Circulation Using Saral Altika Observations (Indian Space Research Organization, Rs.15.42 Lakhs)
6. High resolution mesoscale prediction of land-falling Bay of Bengal cyclones for coastal disaster preparedness (MoES, Govt. of India, Rs.16.20 Lakhs)
7. Land Use Land Cover Dynamics in Relation to Human Dimensions and climate change in Mahanadi, Ganga and Brahmaputra River Basin (Indian Institute of Remote Sensing, ISRO, DehraDun, Rs.41.00 Lakhs)
8. Monitoring of sea ice using oceanat - 2 scatterometer data for determination of climatic trend (Space Applications Centre (ISRO), Ahmedabad, Rs.22.80 Lakhs)
9. Observational & Modeling of Atmospheric Boundary Layer over different land surface conditions in the CTCZ domain (MoES, Rs.0.00 Lakhs)
10. Observational & modeling of atmospheric boundary layer over different land surface conditions in the CTCZ domain during different epochs of Indian summer (MoES, Rs.31.20 Lakhs)
11. Regional assimilation of land surface parameters over Indian landmass for providing surface boundary condition to numerical models for simulation of M (MoES, Rs.64.92 Lakhs)
12. Sea ice monitoring in the Arctic and the Antarctic (National Centre for Antarctic and Ocean Research (MOES), Goa, Rs.45.00 Lakhs)
13. South Asian Precipitation A: Seamless Assessment (SAPRIS) (MoES and UK, Rs.53.00 Lakhs)
14. Study of the surface and upper ocean Mesoscale features of North Indian Ocean from observation and Model (Ministry of Earth Sciences Through OASTC cell, IIT Kharagpur, Rs.31.36 Lakhs)

### ***Consultancy Projects***

1. Study of Forest change Proneness and Resilience in the Hindu-Kush Himalayan Landscapes (ICIMOD, Nepal, Rs.2.47 Lakhs)

### **Visits Abroad by Faculty Members**

1. Behera, Mukunda Dev - Conference Presentation (Tartu, Estonia, ) 24 June to 1 July 2013
2. Behera, Mukunda Dev - Research Discussion (ICIMOD, Nepal, ) 08-10 January 2014
3. Behera, Mukunda Dev - Project Discussion (ICIMOD, Nepal, ) 08-13 March 2014

### **Invited Lectures by Faculty Members**

1. Climate change and its impact over Bay of Bengal *by* Dash, Mihir Kumar (Dr. Harekrushna Mahatab College, Kupari)
2. What contributes to the Himalayan Plant Diversity Heterogeneity? *by* Behera, Mukunda Dev (ICIMOD, Nepal)

3. Mesoscale Prediction of Land-falling Bay of Bengal Cyclones by Mandal, Manabottam (India Meteorological Society, Kolkata)
4. Atmospheric Boundary Layer - Turbulent Transport mechanisms by Satyanarayana, Achanta Naga Venkata (IIT Kharagpur For Training Workshop for IFS Officers)

### ***Papers Published in Journals***

1. 2013. Coherent Structures contributions in fluxes of momentum and heat at two tropical stations during pre-Monsoon Thunderstorm season By Tyagi, B., Satyanarayana, A.N.V., *International Journal of Climatology* DOI: 10.1002/joc.378 (2013)
2. 2013. Coherent Structures contributions in fluxes of momentum and heat at two tropical stations during pre-Monsoon Thunderstorm season By Tyagi, B., Satyanarayana, A.N.V. *Agriculture and Forest Meteorology* 186,43-47 (2014)
3. Analysis of stability parameters in relation to precipitation associated with pre-monsoon thunderstorms over Kolkata, India By H. P. Nayak and M. Mandal *Journal of Earth System Science* In Press (2014)
4. Characterizing Shorea robusta communities in the part of Indian Terai landscape By Chitale VS, Behera MD, Matin S, Roy PS, Sinha VK. *Jr. of Forestry Res.* 25 (1) (2014)
5. Effect of near-surface bubble plumes on the acoustic signal used in UWACNs By A. K. Mandal, S. Misra and Mihir K. Dash *Wireless Communications and Mobile Computing Conference (IWCMC), 2013 9th International* 1816-1820 (2013)
6. Effect of Pacific warm and cold events on the sea ice behavior in the Indian sector of the Southern Ocean By Pranab Deb, Mihir K. Dash and P. C. Pandey *Deep-Sea Research – I* 84, 59 – 72 (2014)
7. Evaluation of Atmospheric Turbulence, Energy exchanges and structure of convective cores during occurrence of Mesoscale Convective Systems using MST Radar Facility at Gadanki By Satyanarayana, A.N.V., Sabiha Sultana, T. Narayana Rao and S. Satheesh Kumar *Atmospheric Research* Online Published (2014)
8. India`s biodiversity hotspots face climate change challenges By Chitale VS, Behera MD. *Nature India* doi:10.1038/nindia.2 (2014)
9. Performance Evaluation of PBL and Cumulus Convection Parameterization Schemes of WRF-ARW Model in Simulating Severe Thunderstorm Events over Gadanki MST Radar Facility - Case study By Srikanth Madala., Satyanarayana, A.N.V., and T. Narayana Rao *Atmospheric Research* 139, 1-17 (2014)
10. Stochastic modeling of internal wave induced acoustic signal fluctuation and performance evaluation of shallow UWANs By A. K. Mandal, S. Misra and Mihir K. Dash *IEEE International Conference on Communications 2013: IEEE ICC'13 – 3rd IEEE International Works* 1101 – 1105, (2013)
11. Storm Surge Studies in the North Indian Ocean: A Review By C. Shaji, S. K. Kar and T. Vishal *IJMS* 43 (2) 125-147 (2014)
12. Surface Energy Exchanges during pre-monsoon thunderstorm activity over tropical station Kharagpur By 2. Bhishma Tyagi, ANV Satyanarayana, R.K. Rajvanshi and M. Mandal *Pure and Applied Geophysics* DOI 10.1007/s00024-0 (2013)
13. Surface mesoscale features associated with leading convective line-trailing stratiform squall lines over the Gangetic West Bengal By S. Dawn and M. Mandal *Meteorology and Atmospheric Physics* DOI: 10.1007/s00703- (2014)
14. Terrestrial carbon studies and earth observation data By Behera MD and Dash J. *Current Science* 104 (4) (2013)
15. Thermodynamical structure of atmosphere during pre-monsoon thunderstorm season over Kharagpur as revealed by STORM data, By Tyagi, B., Satyanarayana, A.N.V., and Naresh Krishna, V., *Pure and Applied Geophysics* 170(4), 675-687 (2013)
16. Wind-Wave Climate Projections for the Indian Ocean from Satellite Observations By Prasad K. Bhaskaran, Nitika Gupta and Mihir K. Dash *Journal for Marine Science: Research and Development* (Accepted) (2014)

### *Papers Presented in Conferences*

1. Simulation of inter-annual and inter-seasonal variability of climate over India using RegCM4 - Sensitivity to cumulus convection, *By* S. Nayak, M. Mandal and S. Maity, *International Conference on Regional Climate – CORDEX*, Brussels, Belgium, (2013)
2. Assessment of the Predictive Capability of the Multiscale Features of the Bay of Bengal Using Regional Ocean Modeling System, *By* Chakraborty A., Sil S. and Jana S., *AOGS*, Singapore, (2012)
3. Eco-complexities in Indian biodiversity hotspots, *By* Behera MD, Roy PS, Chitale, VS., *IAVS-2013*, Tartu, Estonia, (2013)
4. Evaluation of Integrated WRF-AERMOD Model in NO<sub>x</sub> dispersion over Visakhapatnam: A case study, *By* 2. Rahul Boadh, Satyanarayana A.N.V., Srikanth Madala and Rama Krishna T.V.B.P.S., *International Tropical Meteorology Symposium (INTROMET-2014)*, SRM University, Chennai, (2014)
5. Impact of Initial and boundary condition on mesoscale simulation of Bay of Bengal cyclones using WRF model, *By* K.S. Singh and M. Mandal, *HIGH IMPACT WEATHER EVENTS AND THEIR PREDICTION OVER HIGH IMPACT WEATHER EVENTS AND THEIR PREDICTION OVER THE SAARC REGION*, New Delhi, (2013)
6. Modelling Contribution of Wildfires in Predicting Distribution of Four Endemic Tree Species in western Himalaya, *By* Chitale, VS, Behera MD, *ISEM-2013*, Toulouse, France, (2013)
7. Performance Evaluation of PBL schemes of WRF-ARW Model and Integration with Lagrangian Particle Dispersion Model in the air pollution dispersion over a Coastal Region, *By* 1. Srikanth Madala, Satyanarayana A.N.V. and Srinivas, C.V, *International Tropical Meteorology Symposium (INTROMET-2014)*, SRM University, Chennai, (2014)
8. Sensitivity of Indian summer monsoon simulation to cumulus convection using RegCM4 with Community Land Model, *By* S Maity, M Mandal and S Nayak, *International Conference on Regional Climate – CORDEX*, Brussels, Belgium, (2013)
9. What contributes to higher species richness and endemism? A study of two Indian biodiversity hotspots, *By* Chitale, VS, Behera MD, Roy PS, *Intecol-2013*, London, U.K., (2013)



## Cryogenic Engineering Centre

### **Head**

Prof. Kanchan Chowdhury

### **Professors**

Bandyopadhyay, Syamalendu Sekhar	<i>Ph.D.(IIT Kharagpur)</i> , Natural gas processing, Carbon dioxide capture and sequestration, Air breathing propulsion, Separation processes
Chowdhury, Kanchan	<i>Ph.D.(IIT Kharagpur)</i> , Helium Liquefier and Refrigerator, Cryogenic Air Separation, Prevention of Fire in Oxygen-rich systems, Electrostatics and Safety, Heat Exchanger, Refrigeration Technology and Cold Storage, Closed Cycle Cryorefrigerator
Dey, Tapas Kumar	<i>Ph.D.(Delhi Univ)</i> , Superconducting Levitation, Thermal Properties of Polymer Nanocomposites, Electrical and thermal properties of Superconductors, Magnesium Di-boride Superconductors: Critical Current density and Pinning mechanism.
Rao, Vutukuru Vasudeva	<i>Ph.D.(IIT Madras)</i> , Vacuum Technology, Cryogenic Engineering, Applied Superconductivity
Sarangi, Sunil Kumar	<i>Ph.D.(Stony Brook)</i> ,

### **Associate Professor**

Ghosh, Parthasarathi	<i>Ph.D.(IIT Kharagpur)</i> , Low Temperature Processes and equipment, Cryogenic turboexpander and expansion devices, Helium Refrigeration and liquefaction systems, Cryogenic storage and transfer, Thermodynamics and heat transfer of supercritical helium
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### **Assistant Professors**

Adyam, Venimadhav	<i>Ph.D.(IISc. Bangalore)</i> , Multiferroics Spintronics Multicaloric cooling Nanomaterials and Thin film batteries
Ghosh, Indranil	<i>Ph.D.(IIT, Kharagpur)</i> , Compact Heat Exchangers, Heat Transfer in Porous Media, Sorption Cooling
Nandi, Tapas Kumar	<i>Ph.D.(IIT Kharagpur)</i> , Perforated plate matrix heat exchanger, Cryogenic wave expander, Cryogenic rocket propulsion
Sandilya, Pavitra	<i>Ph.D.(IIT Kanpur)</i> , Gas hydrates, Cryogenic transport Phenomena-based processes, CO2 capture and sequestration, Space cooling

### **Faculty Appointments**

Parthasarathi Ghosh	Associate Professor
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### **Faculty Retirement**

Sunil Kumar Sarangi	Professor
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### **Brief Description of on-going activities**

Cryogenic Engineering Centre is engaged in teaching at UG and PG levels, sponsored research and consultancy remain at the core activity of the Centre.

The Centre is also active in Continuing Education through training engineers from industries, faculty from academic institutions, and scientists from R&D organisations by conducting short term courses and workshops in specialised areas like Cryogenic Engineering, Air Seapartio, Vacuum Technology etc.

### ***Thrust Areas***

1. Cryogenic Engineering
2. Advanced Materials
3. Nonconventional Energy

### ***Doctoral and MS Degrees Awarded***

1. Tisha Milind Dixit : Experimental and Theoretical Studies on Miniature Crossflow Heat Exchangers(MS)
2. Sukanta Dash : Carbon dioxide capture by absorption in piperizine activated 2-amino-2-methyl-1-propanol solvent(Ph.D)

### ***Member - Professional Bodies***

1. Sandilya, Pavitra, *Life Member* - Indian Cryogenic council
2. Nandi, Tapas Kumar, *Life Member* - Indian Society for Technical Education (ISTE)
3. Nandi, Tapas Kumar, *Life Member* - Indian Cryogenics Council
4. Ghosh, Parthasarathi, *Regular* - Indian Cryogenic Council
5. Ghosh, Parthasarathi, *Regular* - American Society of Mechanical Engineers
6. Ghosh, Parthasarathi, *Regular* - Plasma Science Society of India, Ahmedabad
7. Adyam, Venimadhav, *Parmanent* - Magnetic Society of India
8. Dey, Tapas Kumar, *Regular (life Member)* - Indian Cryogenic Council
9. Dey, Tapas Kumar, *International Scientific Committee Member* - Asian Thermophysical Society
10. Dey, Tapas Kumar, *Fellow (Life member)* - Thermophysical Society of India
11. Dey, Tapas Kumar, *Regular (Life Member)* - Materials Research Society of India
12. Rao, Vutukuru Vasudeva, *Senior Member* - IEEE-Senior Member
13. Rao, Vutukuru Vasudeva, *Life* - Indian Cryogenics Council
14. Rao, Vutukuru Vasudeva, *Life* - Indian Vacuum Society
15. Chowdhury, Kanchan, *Member* - Indian Institute of Chemical Engineers
16. Chowdhury, Kanchan, *Member* - Indian Cryogenic Council
17. Bandyopadhyay, Syamalendu Sekhar, *Life Member* - Indian Institute of Chemical Engineers

### ***Member - Editorial Board***

1. Dey, Tapas Kumar (2011) *Member* - Indian Journal of Cryogenics

### ***Awards & Honours***

1. Bandyopadhyay, Syamalendu Sekhar (2012) *Member, Programme Advisory and Monitoring Committee (PAMC) of National Programme of Carbon Sequestration Research of DST*

### ***Sponsored Research Projects***

1. A bridge project aimed at the expansion of Lithium ion battery research (SRIC, Rs.5.00 Lakhs)

2. Analysis & Development of Conceptual Design Methodologies for Air Collection and Enrichment System of Air Breathing Propulsion-Phase II ( ISRO, Rs.30.00 Lakhs)
3. Design and development of perforated plate heat exchangers for cooling of gaseous helium by using liquid hydrogen (Indian Space Research Organisation, Rs.20.00 Lakhs)
4. Design, Fabrication and Testing of Miniature Heat Exchangers and Heat Sinks (COMPLETED) (CSIR, New Delhi, Rs.10.61 Lakhs)
5. Fabrication of oxide multiferroic thin films by RF Magnetron Sputtering: Investigation of magnetodielectric and magnetoferroelectric properties (DST, Rs.17.00 Lakhs)
6. Investigation of Magnetoelectric and Magnetodielectric behaviour in Charge Ordered Manganite System (CSIR, Rs.0.00 Lakhs)
7. Investigation on polymer nanocomposite for electronic packaging applications (CSIR, New Delhi, Rs.10.76 Lakhs)
8. Na-ion rechargeable batteries, a cost effective alternative to Li-ion technology (CSTEP, Rs.5.60 Lakhs)
9. Radiation Heat Transfer in Open Cell Metal Foam - An Experimental Study (ON-GOING) (CSIR, New Delhi, Rs.18.42 Lakhs)
10. Refurbishing a DC/RF Sputtering and development of Ferromagnetic/semiconductor hybrid structures for spintronics (SRIC (Completed), Rs.4.60 Lakhs)
11. Studies on novel Heusler alloys for the development of environmentally friendly thermoelectric materials (DST, Rs.34.00 Lakhs)
12. Synthesis and multiferroic properties of AFe<sub>2</sub>O<sub>19</sub> (A= Ba, Sr) nanoparticles reinforced polymer nanocomposites for space applications (CSIR, Rs.18.00 Lakhs)
13. Thermal and Mechanical Properties of Polymer Nanocomposites and Agro-fiber based Biocomposites ( Department of Science & Technology, Govt. of India, Rs.40.00 Lakhs)
14. Thermohydraulic simulation of LOX booster turbopump for semi-cryogenic rocket engine (ISRO, Rs.10.18 Lakhs)

### ***Consultancy Projects***

1. Characterization of cryochamber and soaking chamber (STNIL Cryogenics, Rs.1.00 Lakhs)
2. Conceptual Design of a Novel Method for Extraction of Methane Gas from Submarine Gas Hydrate by Seabed Heating (KDMIPE (ONGC), Rs.50.24 Lakhs)
3. Design of Support Structure for Cryogenic HTS Coil of HTSC Motor (BHEL, Rs.11.85 Lakhs)
4. Development of Gas Sweetening Technology for Removal of CO<sub>2</sub> from Natural Gas and Industrial Gas Streams by Using Blended/Activated Amine Solvents. (Engineers India Limited (EIL)), Rs.30.00 Lakhs)
5. Discussion on feasibility of producing SO<sub>3</sub> with pure oxygen and alternative cycle for oxygen production (Greentec India Pvt. Ltd., New Delhi., Rs.1.20 Lakhs)
6. R & D Projects on High Temperature Superconductor Technology (RDTS) (Power Grid Corporation of India Ltd, Rs.67.41 Lakhs)
7. Technical interaction and training of engineers in ORYX-GTL Plant at Doha, Qatar, 2013 (ORYX-GTL, Qatar, Rs.20.00 Lakhs)

### **Visits Abroad by Faculty Members**

1. Ghosh, Indranil - To attend Int. Sorption Heat Pump Conference 2014 (University of Maryland, College Park, ) March 29-April 4, 2014
2. Bandyopadhyay, Syamalendu Sekhar - Invited lecture (Monash University, Australia, ) June 2013
3. Bandyopadhyay, Syamalendu Sekhar - Research collaboration (University of Melbourne, Australia, ) June 2013

### **Invited Lectures by Faculty Members**

1. Cryogenics and Rocket Propulsion *by* Nandi, Tapas Kumar (Jawahar Novodaya Vidyalaya, Paschim Medinipur, WB)
2. Guest of honour and Chief speaker in seminar on Advances in Special materials *by* Rao, Vutukuru Vasudeva (Bhubaneswar)
3. to deliver Invited lectures at Powergrid, Gurgaon in the workshop on application of superconductors *by* Rao, Vutukuru Vasudeva (Gurgaon)
4. Invited Lecture and to Interact with faculty members of Electrical engineering dept of NIT Rourkela *by* Rao, Vutukuru Vasudeva (Rourkela)
5. Carbon dioxide capture with activated hindered amine solvents *by* Bandyopadhyay, Syamalendu Sekhar (Monash University, Australia)
6. Computational Methods for Chemical Engineers *by* Sandilya, Pavitra (Chennai)

### **Short-Term Courses, Training Programmes and Workshops organised**

1. CRYOGENIC AIR SEPARATION-2014 (22-27 March, 2014)
2. Cryogenic Technology: Materials, processes & equipment (17-21 February 2014)
3. PREVENTION OF FIRE IN OXYGEN-ENRICHED SYSTEMS-2014 (28-29 March-2014)
4. Two week course on Vacuum Technology and Process Applications (18-11-13 to 27-11-13)

### **Papers Published in Journals**

1. Exergy analysis of large scale helium liquefiers: evaluating design trade-offs *By* Rijo Jacob Thomas, Parthasarathi Ghosh, and Kanchan Chowdhury *Proceedings of the CEC/ICMC, Advances in Cryogenic Engineering Vol 59A* In Press (2013)
2. A cycle configuration for large scale helium refrigerator for fusion devices towards complete mitigation of the effects of pulsed heat load. *By* Rohan Dutta, Parthasarathi Ghosh, and Kanchan Chowdhury. *Fusion Engineering and Design*, Vol. 88, 2972-2982 (2013)
3. A new scaling relation for n-AlN doped superconducting MgB<sub>2</sub> *By* D. Tripathi, and T. K. Dey *Journal of Applied Physics* 114, 093906-11 (2013)
4. A study of crossover from 3D ferrimagnetic bulk NiCr<sub>2</sub>O<sub>4</sub> compound into 2D spin-glass-like nanophase *By* I. H. Singh, T. Ono, T. Chakraborty, K. Srikanth, A. Venimadhav, R. Chandra, C. Mitra, U. Kuma *J. NanoPart. Res* 16, 2354 (2014)
5. Analysis of drying and dilution in phosphoric acid fuel cell (PAFC) using galvanometric study and electrochemical impedance spectroscopy *By* T. Paul, M. Seal, D. Banerjee, S. Ganguly, K. Kargupta, P. Sandilya *Journal of Fuel Cell Science and Technology* 11 (2014)
6. Annealing effect on the dielectric response of novel polymer/ nano-quasicrystalline composites *By* Ch. Venkatesh, V. V. Rao *AIP Conference proceeding 1536* pp 879-880 (2013)
7. Centrifugal stress analysis on small cryogenic turboexpander, *By* Rahul Bhaskar, Nandi, Parthasarathi Ghosh, . *International Journal of Mechanical Engineering and Research* 03/2012 1, 29-33. (2012)
8. CFD analysis of energy separation in Ranque-Hilsch vortex tube at cryogenic temperature *By* Dutta, T., Sinhamahapatra, K., Bandyopadhyay, S.S., *Journal of Fluids* Volume 2013 (2013)
9. Critical current density and grain connectivity of starch doped MgB<sub>2</sub> superconductor *By* D. Tripathi, Sujit Sekhar and T. K. Dey *Journal of Science & Technological Research* Vol.3, 15-18 (2013)
10. Critical current density of MgB<sub>2</sub> superconductor with (Bi,Pb)-2223 addition *By* D. Tripathi, and T. K. Dey *Journal of Alloys Compounds* Accepted-April-14 (2014)
11. Effect of Nano-AlN Addition on the Critical Current Density of MgB<sub>2</sub> Superconductors *By* D. Tripathi, and T. K. Dey *Journal of Superconductivity and Novel Magnetism* DOI10.1007/s10948-01 (2014)

12. Effect of site disorder on the electronic properties of Fe<sub>2</sub>VAl Heusler alloy By Ch. Venkatesh, V. Srinivas, S. K. Srivastava, V. V. Rao and P.S.Babu *Journal of Alloys and Compounds* vol. 577, pp 417 (2013)
13. Enhanced thermophysical properties of Nanofluids and their applications in electronic cooling, By T. K. DEY *Advances in Materials Science & Technologies* pp. 382 - 415 (2013)
14. Evaluating performance of mixed mode multistage helium plants for design and off-design conditions by exergy analysis By Arpan Kundu and Kanchan Chowdhury *International Journal of Refrigeration* Vol 38, Pg. 46–57 (2014)
15. Exergy Analysis of large scale Helium Liquefiers: Evaluating Design Trade-offs By Rijo Jacob Thomas, Parthasarathi Ghosh, and Kanchan Chowdhury *Advances in Cryogenic Engineering* Vol 59A (2013)
16. Fires in Indian hospitals: root cause analysis and recommendations for their prevention By Kanchan Chowdhury *Journal of Clinical Anesthesia*, Vol. 26, no. 4, (2014)
17. Generating Continuous Solid Sorption Cooling in a Single Adsorbent Tube - Experiment and Generalised Transient Analysis By Koley, S., and Ghosh, I. *International Journal of Heat & Mass Transfer* Vol. 72, pp. 470-478 (2014)
18. Giant zero field cooled spontaneous exchange bias effect in phase separated La<sub>1.5</sub>Sr<sub>0.5</sub>CoMnO<sub>6</sub> By J. Krishna Murthy and A.Venimadhav, *Applied Physics Letters* 103, 252410 (2013)
19. Identification of critical equipment and determination of operational limits in helium refrigerators under pulsed heat load By 13. Rohan Dutta, Parthasarathi Ghosh, and Kanchan Chowdhury *Cryogenics* Accepted (2013)
20. Influence of Aluminium Nitride (nano) on the superconducting properties of MgB<sub>2</sub> By D. Tripathi, and T. K. Dey *AMST-2012 conference proceeding* pp. 248-263 (2013)
21. Low Reynolds Number Thermo-Hydraulic Characterization of Offset and Diamond Minichannel Metal Heat Sinks By Dixit, T. and Ghosh, I. *Experimental Thermal & Fluid Science* Vol. 51, 227-238 (2013)
22. Magnetic field induced dielectric relaxation in the strain glass state of Pr<sub>0.6</sub>Ca<sub>0.4</sub>MnO<sub>3</sub> By K. Devi Chandrasekhar, A. K. Das, A. Venimadhav *Journal of Applied Physics* 113, 173907 (2013)
23. Mitigation of Effects of Pulsed Heat Load from Fusion Devices on Helium Refrigerator: A Novel Technique using Vapor Compression Cycle By Rohan Dutta, Parthasarathi Ghosh, and Kanchan Chowdhury *International Journal of Refrigeration* Vol. 36, No. 6 (2013)
24. Optimum number of stages and intermediate pressure level for highest exergy efficiency in large helium liquefiers By 14. Rijo Jacob Thomas, Parthasarathi Ghosh, and Kanchan Chowdhury *International Journal of Refrigeration* In Print (2013)
25. Pool Boiling Heat Transfer and Critical Heat Flux Enhancement of Copper Nanoparticles Dispersed in Distilled Water By Madhusree Kole and T. K. Dey *Journal of Nanofluids* Vol. 3, pp. 1 - 12 (2014)
26. Reentrant cluster glass behavior in La<sub>2</sub>CoMnO<sub>6</sub> nanoparticles By J. Krishna Murthy and A. Venimadhav *Journal of Applied Physics* 113, 163906 (2013)
27. Role of Particle size on the magnetoresistance of nano-crystalline Graphite By Guruprasad Mandal, V. Srinivas, V. V. Rao, *Carbon* Vol. 57, pp. 139-145 (2013)
28. Simulation and parametric study of post-combustion CO<sub>2</sub> capture process using (AMP+PZ) blended solvent By Dash, S.K., Samanta, A.N., Bandyopadhyay, S.S. *International Journal of Green House Gas Control*, 21, 130–139 (2014)
29. Two-stream Cross Flow Heat Exchangers in Thermal Communication with the Surroundings - A Generalised Analysis By Dixit, T. and Ghosh, I. *International Journal of Heat & Mass Transfer* Vol. 66, 1-9 (2013)

### *Papers Presented in Conferences*

1. Designing process plant with pulsating loads: Exergy analysis of helium plants for fusion reactors, By Rohan Dutta, Rijo J Thomas, Parthasarathi Ghosh and Kanchan Chowdhury, *National Conference on Energy Engineering, Analysis, Audit and Management., India, ., NIT Agarpara, Kolkata, (2013)*
2. Activated Carbon Based Solid Sorption Cooling Using Different Adsorptives in Different Temperature Zones (Paper No. HMTC1300161), By Koley, S. and Ghosh, I., *22nd National and 11th International ISHMT-ASME Heat and Mass Transfer Conference, IIT Kharagpur, (2013)*
3. Analysis of various liquid nitrogen pre-cooling schemes for large-scale helium liquefiers/refrigerators., By Rahul Verma, Rohan Dutta, Parthasarathi Ghosh, and Kanchan Chowdhury, *24th National Symposium on Cryogenics, IPR, Gandhinagar, (2013)*
4. “Critical current density and grain connectivity of Bi- 2223 added MgB<sub>2</sub> superconductor”, By D. Tripathi, and T. K. Dey, *58th DAE Solid State Physics symposium, Thapar University, Patiala, Panjab., (2013)*
5. Critical current density and grain connectivity of starch doped MgB<sub>2</sub> superconductor, By D. Tripathi, and T. K. Dey, *5th National Conference on “Nanotechnology and Materials Science (NATCON NAMTECH- 2013), Dept. of Physics, University of Lucknow., (2013)*
6. Design of a setup to cool liquid nitrogen by bubbling helium, By P Sandilya, and Anuj Kumar, *CHEMCON 2013, Mumbai, (2013)*
7. Evaluation of a technique to mitigate effects of pulsed heat load of fusion devices on helium refrigerator., By Rohan Dutta, Soumyarup Roy, Parthasarathi Ghosh, and Kanchan Chowdhury, *24th National Symposium on Cryogenics, IPR, Gandhinagar, (2013)*
8. Exergy analysis to determine appropriate design and operating parameters for Collins refrigerator-liquefier under mixed mode operation., By A. Kundu, R.J. Thomas, P. Ghosh, K. Chowdhury, *12th Cryogenics 2012 - IIR Conference, Dresden, Germany, (2012)*
9. Experimental Investigation of Straight Mini-Channel Heat Sinks Along with Comparison of Internal Flow and Fin Analysis Approaches (Paper No. HMTC1300162), By Dixit, T. and Ghosh, I., *22nd National and 11th International ISHMT-ASME Heat and Mass Transfer Conference, IIT Kharagpur, (2013)*
10. Issues on the testing of a recuperator at cryogenic temperatures and experimental studies on cu-ss perforated plate heat exchangers, By Sunil Kumar S. and T. K. Nandi, *22th National and 11th International ISHMT- ASME Heat and Mass Transfer Conference, IIT, Kharagpur, (2013)*
11. Kinetics of Thermal Degradation of HDPE filled MWCNTs Polymer Nanocomposites: Complementary use of iso-conversional and differential model-fitting methods., By P.Rajeshwari and T.K.Dey, *International Conference on Advancements in Polymeric Materials (APM-2014), CIPET Bhubaneswar, (2014)*
12. Many hospital fires are due to oxygen enrichment: need for redesigning ventilation system, air conditioner and arrangement of intensive care units., By Shekhar Gaikwad, Kanchan Chowdhury, *24th National Symposium on Cryogenics, Institute for Plasma Res, Gandhinagar, (2013)*
13. Mitigation of effects of pulsed heat load to helium refrigerator in fusion devices: use of a cold-compressor., By Rohan Dutta, Parthasarathi Ghosh, and Kanchan Chowdhury, *24th National Symposium on Cryogenics, IPR, Gandhinagar, (2013)*
14. Numerical study of liquid cooling by gas bubbling, By Pavitra Sandilya , Anuj Kumar, Himanshu Chakranarayan and Sonali Sengupta, *CHEMCON 2013, Mumbai, (2013)*
15. On Scope of Improving Solid Sorption Cooling - Generating it Continuously in a Regenerative Single Adsorbent Column, By Ghosh, I., *Int. Sorption Heat Pump Conference 2014, University of Maryland, College Park., (2014)*
16. Performance of large-scale helium refrigerators subjected to pulsed heat load from fusion devices, By Rohan Dutta, Parthasarathi Ghosh, and Kanchan Chowdhury, *International Cryogenic Engineering Conference 24-International Cryogenic Materials Conference, Fukuoka, Japan, (2012)*

17. Post-combustion CO<sub>2</sub> capture: VLE of CO<sub>2</sub> in aqueous sodium glycinate., By Mondal, B.K., Samanta, A.N., Bandyopadhyay, S.S., *Indian Chemical Engineering Congress 2013*, Mumbai, India, (2014)
18. Predicting the electrostatic charging behavior of insulating materials without charging tests., By Ulrich von Pidoll, Kanchan Chowdhury, *12th European Conference on Electrostatics*, Budapest, Hungary, (2013)
19. Pressure drop studies on supercritical helium flowing in horizontal tubes, By Rebello N and Parthasarathi Ghosh, *Proceedings of 22th National and 1th International ISHMT-ASME Heat and M*, IIT Kharagpur, (2013)
20. Probing of phase separation dynamics in Pr<sub>0.6</sub>Ca<sub>0.4</sub>MnO<sub>3</sub> using dielectric spectroscopy, By K Devi Chandrasekhar, A K Das and A Venimadhav, *Novel Materials: Adding materialspecific reality in physicists models*, Natal, Brazil, (2012)
21. Proposed experiments for tribocharging of dust particles and possible ignition upon discharge in oxygen environment., By Debanjana Bhattacharyya, Kanchan Chowdhury, *24th National Symposium on Cryogenics*, Institute for Plasma Res, Gandhinagar, (2013)
22. Thermal Conductivity of AlN (nano) added MgB<sub>2</sub> superconductors?, By D. Tripathi, and T. K. Dey, *7th National Conference on Thermo-physical properties (NCTP-2013)*., CSJM University, Kanpur, (2013)
23. Thermal Degradation Kinetics of High Density Polyethylene filled MWCNTs polymer nanocomposites., By P.Rajeshwari and T.K.Dey, *International Conference on Functional Materials (ICFM-2014)*, IIT Kharagpur, (2014)
24. Thermal degradation mechanism of HDPE reinforced multiwall carbon nano-tubes., By P.Rajeshwari and T.K.Dey, *7th National Conference on Thermo-physical properties (NCTP-2013)*., CSJM University, Kanpur, (2013)
25. Vapour-liquid equilibrium of CO<sub>2</sub> in piperazine (PZ) activated aqueous methyldiethylamine (MDEA) and hybrid solvent aqueous (PZ+MDEA+Sulfolane) and simulation of CO<sub>2</sub> absorption in these solvents, By Dash, S. K., Samanta, A.N., Bandyopadhyay, S. S., *Indian Chemical Engineering Congress 2013*, Mumbai, India, (2014)

## Materials Science Centre

### **Head**

Prof. Shanker Ram

### **Professors**

Adhikari, Basudam

*Ph.D.(Calcutta Univ)*, Membrane Electrode Based Portable e-Tongue Device for Rapid Taste Characterization of Tea, Development of jute based fully biodegradable green composites, Development of jute-cement concrete composites, Development of jute based geotextiles, Development of jute based sound proofing panels, Development of a suitable processing technique for rubber coating of jute, Development of conducting polymer based gas sensors, Polymer based drug delivery systems, Development of volatile compound based biosensor for pest control, Development of polymer based taste sensor, Collagen and chitosan based scaffold for tissue engineering, Development of jute based baby diaper materials, Development of jute based fully biodegradable green composite, Ramie plantation and development of its downstream products

Banerjee, Susanta

*Ph.D.(IIT Kharagpur)*, Fluorinated High performance polymers, Membrane based separation, Hyperbranched polymers, Light emitting polymers, Polymer synthesis and characterization

Banerji, Pallab

*Ph.D.(Jadavpur Univ)*, Low dimensional semiconductors: Structures & Devices, Thermoelectricity, Photovoltaics, Organic semiconductors

Bhattacharya, Debasis

*Ph.D.(Calcutta Univ)*, Synthesis and processing of meso porous ceramics for catalytic applications, Nano HAP for biomedical applications, High proton conductor for application in solid oxide fuel cell

Das, Chapal Kumar

*Ph.D.(IIT Kharagpur)*, Nanocomposites, Direct fluorination, Insitu Nanocomposites for supercapacitor Application, Polymer Blends and its compatibilization, Insitu Nanocomposites for Microwave absorbing Materials, Graphene Based Nanocomposites, Organic Inorganic Hybrid Nanocomposites, Hybrid Materials for Fuel Cell Applications

Jacob, Chacko

*Ph.D.(Case Western, USA)*, Materials Science/ Nanomaterials and Nanotechnology/Semiconductors

Ram, Shanker

*Ph.D.(BHU, Varanasi)*, Glasses and disordered solids, Alloys and intermetallics, Nanoceramics and hybrid composites, Magnetics and magnetocaloric materials, Ferroics and applications, Porous materials and applications, Metallic foams for biological applications, Nanofluids and nanoglues, Films, Optical materials and applications, Biomaterials, Phase transformations and phase transitions, Photonics

### **Associate Professors**

Khatua, Bhanu Bhusan

*Ph.D.(IIT Kharagpur)*, Polymer-clay and Polymer-CNT Nanocomposites, Polymer Blends and Composites, Polymer Blend-Clay nanocomposites: Morphology control, Polymeric PTCR composites, Polymer-Graphene Nanocomposites, polymer-carbon



nanohorn nanocomposites, Polymeric Supercapacitors, Polymer Composites for EMI Shielding Applications

Majumder, Subhasish Basu *Ph.D.(IIT Kanpur)*, Oxide gas sensors, Lithium rechargeable batteries, Natural fiber reinforced cement composites, Fly ash based ceramic products, Multiferroic thin films and composites

***Assistant Professor***

Pradhan, Debabrata *Ph.D.(IIT Bombay)*, Nanostructured Materials, Physical Chemistry, Materials for Energy and Environment, Catalysis

***Brief Description of on-going activities***

Apart from teaching various courses in our M. Tech. Program on Materials Science and Engineering we also teach undergraduate and post graduate level courses on biomaterials, ceramic, polymer and electronic materials to other departments of our Institute. So far as the research activity is concerned our Centre is engaged in development and application of novel polymers, ceramics and semiconductor materials supported by our Institute as well as by various funding agencies. In the area of polymer materials besides polymer modification we synthesize new polymers for application as electronic materials, membranes for gas separation, nanoclay and carbon nanotube reinforced composites for automobiles and other high performance speciality applications. Few research projects are in progress for jute fiber reinforced cement concrete and biodegradable rigid composites. The Centre is now also engaged in a new field of welding thermoplastics, recycling waste polymers and direct fluorination of polymers. Apart from activities on structural ceramics, refractories, and bioceramics, we are also investigating various research issues related to the synthesis of nano-crystalline shape memory materials for biomedical applications, nano-fluids, nano ceramics for drug delivery, nano-structured oxides for ceramic gas sensor and cathode materials for lithium rechargeable batteries. We are also actively involved in the research on ferroic and multiferroic thin/thick films, sensors magnetic and magnetocaloric materials. Novel inorganic and organic semiconductor materials are being synthesized and characterized for various electronic and optoelectronic applications. MOCVD growth of InGaP epitaxial layers as well as quantum dots are also being carried out for various applications such as solar cell, etc. Another important area of research is the synthesis and characterization of wide band gap materials like SiC, ZnO and nitride semiconductors and nano materials for device applications. Multiwall carbon nanotubes are also being synthesized by CVD on silicon substrates.

***Thrust Areas***

1. Nanomaterials / Nanocomposites
2. Energy Materials
3. Magnetic Materials
4. Electrically Conducting Polymer Nanocomposites
5. Polymeric Supercapacitors
6. Polymer Membranes for Gas Separation and Proton Exchange
7. Sensor Materials

***New Acquisitions***

1. Rotary vacuum evaporator (Heidolph), 2. Microwave synthesis system (China National Corp.), 3. Ageing oven, 4. Source Meter (Keithley), 5. Computerized 8 channel battery analyzer (MTI Corp.), 6. Precision Impedance analyzer (Waynekerr), 7. Moisture & oxygen control Glove box (Mbraum, Germany), 8. Single channel FFT analyzer, 9. Electrometer with GPIB & RS232 (Keithley), 10. Solar Simulator System, 11. Photoluminescence System, 12. Differential Scanning Calorimetry (DSC), 13. Thermogravimetric Analyzer, 14. Probe

Station, 15. Thermal Conductivity Measurement System, 16. Universal Tensile Testing Machine, 17. Internal-Mixer, 18. PE Loop, 19. Keithley 4200, 20. Gas Permeation Apparatus.

### ***Doctoral and MS Degrees Awarded***

1. Sarada Prasad Kundu : Jute fibre reinforced cement concrete for structural applications(Ph.D.)
2. Muktikanta Panigrahi : Conducting Polymer Composite for Gas Sensing(Ph.D.)
3. Asish Malas : Elastomeric Nanocomposites Based on Organoclays, Expanded graphite and Graphene Oxide(Ph.D.)
4. S. Srinivas Kalyan Kamal : Synthesis and Characterization of Surface Modified Cobalt and Cobalt Alloys of Core-Shell Nanostructure(Ph.D.)
5. Prasanna A. A : Magnetostructural Transitions, Magnetocalory and Magnetoresistance in Heusler Ni-Mn-Sn Alloys of Granular Nanostructure(Ph.D.)
6. Sridevi A.N. : Jute reinforced soy resin based biodegradable composites(Ph.D.)
7. Rakesh Kumar Sahoo : The Role of the Catalyst in the Synthesis of one Dimensional Carbon Nano Structures(Ph.D.)
8. Sougata Roy Chowdhury : Exopolysaccharide of Riverine – Silt Bacterial Origin: Biosynthesis, Characterization and Evaluation of Therapeutic Potential(Ph.D.)
9. Ajaya Kr. Behera : Reinforcing Behavior of Jute in Soy and Modified Soy Resin Based composites(Ph.D.)
10. Aruna Kumar Mohanty : Semifluorinated Sulfonated Poly (Ether Sulfone)s: Proton Exchange membrane Materials(Ph.D.)
11. Chandan Ghanty : Novel High Energy Density Composite Cathode Materials for Lithium Rechargeable Batteries(Ph.D.)
12. Sumanta Sahoo : Graphene based Polymer Nanocomposites for Supercapacitor Applications(Ph.D.)
13. Sumati Pati : Combustible gas sensing characteristics of undoped and indium doped zinc oxide thin films(Ph.D.)
14. Sandip Maiti : A Strategy to Achieve Low Percolation Threshold with HighElectrical Conductivity in Polymer/Carbon Nanotube Nanocomposites Based on Polycarbonate(Ph.D.)
15. Arundhati Sengupta : Synthesis and Magnetic, Optical and Transport Properties of Stabilized Zirconia Nanoceramics with Chromium Cations(Ph.D.)
16. Sumit Chakraborty : Investigations on the reinforcing behavior of jute fibre in cement mortar(Ph.D.)

### ***Member - Professional Bodies***

1. Jacob, Chacko, *Regular* - National Academy of Sciences, India
2. Banerji, Pallab, *Regular* - MRS, USA
3. Banerji, Pallab, *Member* - IEEE, USA
4. Banerji, Pallab, *Life* - IACS
5. Banerjee, Susanta, *Life Member* - Materials Research Society of India (MRSI)
6. Banerjee, Susanta, *Life Member* - Society for Polymer Science India (SPSI)
7. Majumder, Subhasish Basu, *Life Member* - Materials Research Society of India
8. Khatua, Bhanu Bhusan, *Life member* - Society of the Polymer Science India
9. Adhikari, Basudam, *Life Member* - Materials Research Society of India
10. Adhikari, Basudam, *Life Member* - Society of Biomaterials and Artificial Organs (India)
11. Adhikari, Basudam, *Life Member* - Society of Polymer Science India
12. Adhikari, Basudam, *Life Member* - Biosensor Society of India
13. Adhikari, Basudam, *Life Member* - Asian Polymer Association
14. Adhikari, Basudam, *Member of Regional Advisory Committee* - CIPET, Haldia, West Bengal
15. Adhikari, Basudam, *Trustee Board Member* - Seva-Bharati, Kapgari, Paschim Medinipur
16. Ram, Shanker, *Regular* - Life member of laser and spectroscopy society of India
17. Ram, Shanker, *Regular* - Member of the national academy of sciences, MNSc, Allahabad

18. Ram, Shanker, *Regular* - Member of international board of biography (USA)
19. Ram, Shanker, *Regular* - Life member of society for materials chemistry (SMC), BARC, Mumbai
20. Ram, Shanker, *Regular* - Life member of MRSI (India)
21. Ram, Shanker, *Regular* - Life member of magnetic society of India
22. Ram, Shanker, *Regular* - Life member of powder metallurgy association of India

#### ***Member - Editorial Board***

1. Adhikari, Basudam (2010) *Member of Editorial Board* - Indian Journal of Chemical Technology, CSIR
2. Banerjee, Susanta (2013) *Editorial Advisory Board Member* - e-Polymers
3. Banerjee, Susanta (2013) *Editorial Board Member* - Indian Journal of Materials Science
4. Banerjee, Susanta (2014) *Editorial Board Member* - Journal of Polymeric Materials
5. Banerjee, Susanta (2011) *Editorial Board Member* - International Journal of Plastic and Polymer Technology (IJPPT)
6. Das, Chapal Kumar (0) *Member of the Editorial Board* - WJNSE
7. Das, Chapal Kumar (0) *Member of the Editorial Board* - Research Letters in Materials science
8. Das, Chapal Kumar (0) *Member of the Editorial Board* - Nano Trends
9. Das, Chapal Kumar (0) *Member of the Editorial Board* - Advances in Materials Science and Engineering
10. Majumder, Subhasish Basu (2011) *Editorial Board Member* - Transaction of the Indian Ceramic Society
11. Majumder, Subhasish Basu (2011) *Editorial Board Member* - ISRN Materials Science
12. Pradhan, Debabrata (2011) *Associate Editor* - Materials Express
13. Ram, Shanker (2013) *Editorial Board Member* - J. Nanofluids
14. Ram, Shanker (2011) *Editorial Board Member* - ISRN Nanotechnology

#### ***Awards & Honours***

1. Adhikari, Basudam (2014) *Winner of 4th National Award for Technology Innovation by Ministry of Chemical & Fertilizers, Department of Chemicals & Petrochemicals, Government of India*

#### ***Sponsored Research Projects***

1. Centre of excellence for training and research in microfluidics (CFM) (IIT Kharagpur, Rs.251.90 Lakhs)
2. Development of advanced multifunctional materials for electrochemical energy devices (Indo-Taiwan S&T Cooperation Programme (DST), Rs.30.28 Lakhs)
3. DEVELOPMENT OF ALUMINIUM NITRIDE (AIN) IN BULK FORM (DAF) (SSPL (CARS), Rs.24.33 Lakhs)
4. Development of cotton lap/cellulose pad substitute from jute (National Jute Board, Rs.41.08 Lakhs)
5. DEVELOPMENT OF CURED POLYPHOSPHAZENE FOR WIDE TEMPERATURE RANGE APPLICATIONS (DMSRDE Kanpur, Rs.23.00 Lakhs)
6. Development of durable water-repellent jute geotextiles with natural ecofriendly additive for application in erosion control in river banks (JMDC, Kolkata, Rs.168.73 Lakhs)
7. Development of eco-friendly / biodegradable rigid jute-based composites (JMDC, Kolkata, Rs.69.93 Lakhs)
8. Development of high energy density lithium ion prismatic batteries for laptops, solar and electric vehicles (Future Hi-tech batteries limited, Rs.3.00 Lakhs)

9. Development of MBE Cluster Tool Based Infrastructure and Process Integration Facility for Compound Semiconductor Nano-Devices (Department of Information Technology, Govt. of India, Rs.5000.00 Lakhs)
10. Development of Membrane Electrode Based Portable e-Tongue Device for Rapid Taste Characterization of Tea (C-DAC, Kolkata, Rs.40.00 Lakhs)
11. Development of novel paladium gas sensors (IBSA (DST Tri-National), Rs.16.28 Lakhs)
12. Development of Organic-Organic and Organic-Inorganic Hybrid Nanocomposites for Supercapacitor Applications (DRDO, New Delhi, Rs.45.00 Lakhs)
13. Development of Phase Morphology in Incompatible Polymer Blends by using Nanoclay (DST, New Delhi, Rs.17.18 Lakhs)
14. Development of sensing element and alarm circuit module for hydrogen detection from rechargeable batteries (Naval Science and Technological Laboratory (DRDO), Vizag, Rs.10.00 Lakhs)
15. Development of shape memory magnetocaloric alloys for magnetic cooling and other applications: A nonconventional source of energy (IIT Kharagpur, Rs.0.00 Lakhs)
16. Development of Suitable Production System for Natural Rubber Coated Jute Fabrics for Novel End Uses (JMDC, Kolkata, Rs.30.00 Lakhs)
17. Electrocatalytic investigation of hybrid alloy nanostructures (CSIR, Rs.24.00 Lakhs)
18. GaN/InGaN based light emitting diodes, solar cells and photoelectrochemical devices by MOCVD epitaxial processes (DST, New Delhi, Rs.696.00 Lakhs)
19. Grant for equipment (Alexander von Humboldt Foundation, Germany, Rs.9.02 Lakhs)
20. Heterointerface characterization of MOCVD grown InP quantum dots on Si (Indian beamline (DST), Photon Factory, Japan, Rs.1.50 Lakhs)
21. High strength polyimide-siloxane films with low heat shrinkage (DRDE (Completed), Rs.9.98 Lakhs)
22. Improvement of energy recovery from wastewater by dark fermentation followed by microbial fuel cells (DRDO, Rs.42.00 Lakhs)
23. India-Canada Centre for Innovative Multidisciplinary Partnership to Accelerate Transformation and Sustainability (IC-IMPACTS) (, Rs.0.00 Lakhs)
24. Industrial scale investigation for the fabrication of wear resistant ceramic tiles using NALCO coal ash (NALCO, Bhubaneswar, Rs.50.40 Lakhs)
25. Industrial scale investigation for the fabrication of wear resistant ceramic tiles using NALCO coal ash (NALCO, Bhubaneswar, Rs.50.00 Lakhs)
26. Integrated Project On Jute Ramie Blended Technical Textiles (National Jute Board, Kolkata, Rs.24.00 Lakhs)
27. Metal - oxide - semiconductor (MOS) based non - volatile memory devices using III - V semiconductor quantum dots as charge storage elements on Si sub (Department of Science & Technology, Govt. of India, Rs.48.00 Lakhs)
28. Molecularly engineered novel membrane precursors and preparation of novel polymer nano-composite membranes for selective separation of gas mixture (DST (Completed), Rs.53.00 Lakhs)
29. Novel polymeric composite membranes for selective separation of gas mixtures (DST, New Delhi, Rs.55.00 Lakhs)
30. Novel polymeric composite membranes for selective separation of gas mixtures (DST, Rs.55.00 Lakhs)
31. Preparation and supply of poly(ether imide siloxane)s as membrane materials in bulk quantity for analytical sample inlet (DRDE (Completed), Rs.8.52 Lakhs)
32. Preparation of Novel Polymeric Materials for Chemical Sensor Application: Synthesis and Tailoring of Properties in Molecular Level (DRDE (Completed), Rs.7.54 Lakhs)
33. Self-controlled growth of Fe<sub>3</sub>BO<sub>6</sub>- $\delta$  ( $\delta = 0, 1$ ) nanofibrils with a bonded surface layer from a vitreous glass: A novel magnetodielectric material for (CSIR, New Delhi, Rs.20.00 Lakhs)
34. Silicon Carbide sensors as high temperature MEMS & MOSFET devices. (ISRO (KCSTC), Rs.5.88 Lakhs)
35. Synthesis and characterization of novel light emitting poly(arylene)s and poly(arylene ether)s and derivative thereof (CSIR (Completed), Rs.9.00 Lakhs)

36. Synthesis and multiferroic properties of AFe<sub>2</sub>O<sub>19</sub> (A = Ba, Sr) nanoparticles reinforced nanocomposites for space applications (CSIR, New Delhi, Rs.14.56 Lakhs)
37. Synthesis of mixed metal oxide, and porous oxide nanostructured materials by using hydrothermal technique (ISIRD, SRIC, IIT-Kharagpur, Rs.5.00 Lakhs)
38. Synthesizing super-catalysts and tracking their catalytic pathways (DST, Indo-Korea Int., Rs.25.00 Lakhs)
39. Test Marketing of Cotton Lap/Cellulose Pad Substitute from Jute (National Jute Board, Kolkata, Rs.19.00 Lakhs)
40. Use of Nanocomposites for Efficient Welding of Thermoplastics (DST, New Delhi, Rs.7.90 Lakhs)

### ***Consultancy Projects***

1. Guidelines for recovery of Shellac Waste (Jaiswal Shellac Industry, Purulia, West Bengal, Rs.0.50 Lakhs)
2. Synthesis of PI-PDMS materials & preparation of membranes (L&T-Heavy Engineering, Rs.8.00 Lakhs)
3. Synthesis of the soluble para-aramid polymers (KERMEL-France (Completed), Rs.7.00 Lakhs)
4. Synthesis of the soluble para-aramid polymers (phase II) (KERMAL- France, Rs.3.50 Lakhs)
5. Thermoset polymer based meter boxes & distribution boxes: An ecological disaster (Ester Industries Limited, Gurgaon (Completed), Rs.5.00 Lakhs)
6. Trial Production of Corrugated Roofing Sheets with partial replacement of asbestos fiber by Jute (RAMCO, Chennai, Rs.3.00 Lakhs)

### ***Patents (filed / granted)***

1. A low cost, portable and drift corrected semi-conducting metal oxide gas sensor device and process for domestic and industrial applications
2. A Process Technology for Manufacturing Jute Cellulose Fiber as a Substitute for Cotton Cellulose and a Process Technology for Manufacturing Super Absorbent Polymer for Use in Sanitary Napkin and Diaper
3. Biodegradable and rigid natural resin matrix jute fiber reinforced composites
4. Casting of concrete pipe reinforced with chemically modified jute fiber and method of casting such fiber reinforced concrete pipe
5. Chemically modified jute fiber reinforced high strength concrete and process thereof
6. Composition And Method For Making Polyarylene Ether Copolymers
7. Conductive wire comprising polysiloxane /polyimide copolymer blend
8. Conductive Wire Comprising A Polysiloxane /Polyimide Copolymer Blend
9. Conductive Wire Comprising A Polysiloxane/Polyimide Copolymer Blend
10. Development of cost effective membrane cathode assembly for a single chambered microbial fuel
11. Durability enhancement of lignocellulosic fibers by vegetable oil treatment
12. Earthen material based cathode separator assembly for bioelectrochemical system
13. Inherent Polymeric PTCR Composites: Article and Associated Device
14. Inherent Polymeric PTCR Composites: Article and Associated Device
15. Inherent Polymeric PTCR Composites: Composition and Associated Method
16. Inherent Polymeric PTCR Composites: Composition and Associated Method
17. Microbial transformation of lignocellulosic fibers using ecofriendly reagents for strength and durability enhancement
18. Polysiloxane / polyimide copolymers and blends thereof
19. Polysiloxane/Polyimide Copolymers And Blends Thereof
20. Process for Chemically Modified Jute Fiber Reinforced High Performance Cement Sheet
21. Process for chemically modified jute fiber reinforced high performance cement sheet

22. Process for making polysiloxane / polyimide copolymer blends
23. Process For Making Polysiloxane/Polyimide Copolymer Blends

#### Visits Abroad by Faculty Members

1. Jacob, Chacko - 15th Asian Chemical Congress (Singapore, ) August 19-24
2. Banerji, Pallab - to conduct experiment at Photon Factory (KEK), Tsukuba (Japan, ) 17 - 25 May 2013
3. Pradhan, Debabrata - Collaboration work (University of Waterloo, Canada, ) May 4 - July 20, 2013
4. Pradhan, Debabrata - Collaboration work (Yeungnam University, South Korea, ) Nov. 14 - Nov. 28, 2013
5. Banerjee, Susanta - To deliver an Invited talk in BPS-13 (Bayreuth, Germany, ) One week
6. Das, Chapal Kumar - To attending Conference (Hong Kong, ) 6-13 April, 2013
7. Majumder, Subhasish Basu - In depth discussion and laboratory work on Li ion battery (National Central University and ITRI, Taiwan, ) 9th to 31st December 2013
8. Adhikari, Basudam - To present a paper in IEEE Sensor 2013 (Baltimore, USA, ) November 4-6, 2013

#### Invited Lectures by Faculty Members

1. Layered-layered type composite cathodes for lithium ion rechargeable batteries *by* Majumder, Subhasish Basu (NCU, Taiwan)
2. Science and technology of high energy density composite cathodes for lithium rechargeable batteries *by* Majumder, Subhasish Basu (IISc, Bangalore: Taiwan-India bilateral workshop on energy storage devices)
3. Carbon based nanostructures *by* Jacob, Chacko (CGCRI Kolkata)
4. Nanomaterials and their applications *by* Jacob, Chacko (UGC Refresher Course on Recent Development on Nanoscience and Technology at Jadavpur University)
5. Sources for Fiber Optic Communication, White LEDs and Blu-ray Disc: three modern Photonic Devices *by* Banerji, Pallab (College of Engineering & Management)
6. Jute as Reinforcing fiber, Geotextile and Absorbent Material: From Myth to Reality *by* Adhikari, Basudam (S K University, Anantapur, AP)
7. Natural Fiber Reinforced Composites: From Myth to Reality *by* Adhikari, Basudam (CIPET, Cochin)
8. High performance fluorinated polymers: Proton exchange membrane properties *by* Banerjee, Susanta (Recent advances in Polymer & Rubber Science & technology (RAPT2014), 22-24 January, Kolkata)
9. High performance fluorinated polymers *by* Banerjee, Susanta (Bayreuth polymer symposium (BPS-13), 15th to 17th September, Bayreuth, Germany)
10. Semifluorinated sulfonated high performance polymers for proton exchange membrane materials *by* Banerjee, Susanta (3rd FAPS polymer congress and MACRO-2013, 15th to 18th May, IISc, Bangalore)
11. Similarity in functionalities in nanomaterials and green nature relevant to advancing science and te *by* Ram, Shanker (The University of Burdwan, India)
12. Chemistry and physics of small structures of solids and applications *by* Ram, Shanker (The University of Burdwan, India)
13. Nonmaterials for energy applications□?, QIP short term course on “Renewable energy materials and appl *by* Ram, Shanker (Indian Institute of Technology, Kharagpur, India)
14. Nanomaterials for photonics *by* Ram, Shanker (Indian Institute of Technology, Kharagpur, India)
15. Nucleation and growth of functional materials□?, Short term course on “Nanomaterials: Synthesis and c *by* Ram, Shanker (NIT, Durgapur, India)

16. Nucleation and growth of solid of small structures by Ram, Shanker (Department of Physics, Gorakhpur University, Gorakhpur, India.)
17. Discovery of Raman scattering from molecules by Ram, Shanker (ISM Dhanbad, India)
18. Nucleation and growth of nanomaterials□?, Short term course on “Nanomaterials: Synthesis and character by Ram, Shanker (National Institute of Technology, Patana, India)
19. Polymers as Sensor Materials by Adhikari, Basudam (IIT Kharagpur)
20. Role of polymers in sensors and sensing: An overview by Adhikari, Basudam (Jadavpur University, Kolkata)

#### **Short-Term Courses, Training Programmes and Workshops organised**

1. Materials Engineering & Industrial Applications: Hybrid Nanocomposites for Photonics, Energy & Elect (November 11-22, 2013)
2. Materials for Advanced Applications (Sept 2-13, 2013)
3. Materials for Advanced Applications (2 weeks)

#### **Papers Published in Journals**

1. Fundamental nature and CO oxidation activities of indium oxide nanostructures: 1D-wires, 2D-plates, and 3D-cubes and donuts By W. J. Kim, D. Pradhan, Y. Sohn *J. Mater. Chem. A* 1, 10193-10202 (2013)
2. Graphene supported a-MnO<sub>2</sub> nanotubes as a cathode catalyst for improved power generation and wastewater treatment in single-chambered microbial fuel cells. By S. Khilari, S. Pandit, M. M. Ghangrekar, D. Das, D. Pradhan *RSC Advances* 3, 7902-7911. (2013)
3. Influence of Precursor Concentration, Surfactant and Temperature on the Hydrothermal Synthesis of CuS: Structural, Thermal and Optical properties By J. Kundu, D. Pradhan *New J. Chem.* 37, 1470-1478. (2013)
4. Phase-Induced Shape Evolution of FeNi Nanoalloys and Their Air Stability by In-Situ Surface Passivation By N Moghimi, S Bazargan, D Pradhan, K. T. Leung *J. Phys. Chem. C* 117, 4852–4858. (2013)
5. Synergy of Low-Energy {101} and High-Energy {001} TiO<sub>2</sub> Crystal Facets for Enhanced Photocatalysis. By N. Roy, Y. Sohn, D. Pradhan, *ACS Nano* 7, 2532-2540. (2013)
6. A comprehensive study on enhanced characteristics of modified polylactic acid based versatile biopolymer By Moumita Bishai, Swarnalok De, Basudam Adhikari, Rintu Banerjee *European Polymer Journal* 54, 52–61 (2014)
7. A facile synthesis of palladium doped polyaniline modified carbon nanotube composite for supercapacitor application By Soumen Giri, Debasis Ghosh, Asish Malas, Chapal Kumar Das *Journal of Electronic Materials* 42, 2595-2605 (2013)
8. A strategy for achieving low percolation and high electrical conductivity in melt-blended polycarbonate (PC)/multiwall carbon nanotube (MWCNT) nanocomposites: Electrical and thermo-mechanical properties By S. Maiti, N. K. Shrivastava, S. Suin, B. B. Khatua *Express Polymer Letters* 7, 505-518 (2013)
9. A strategy to achieve high electromagnetic interference shielding and ultra low percolation in multiwall carbon nanotube-polycarbonate composites through selective localization of carbon nanotubes By S. Maiti, S. Suin, N.K. Shrivastava and B.B. Khatua *RSC Advances* 4, 7979-7990 (2014)
10. Adsorption/photocatalytic activity and fundamental natures of BiOCl and BiOCl<sub>x</sub>I<sub>1-x</sub> prepared in water and ethylene glycol environments, and Ag and Au-doping effects. By W. J. Kim, D. Pradhan, B. -K. Min, Y. Sohn *Appl. Catal., B* 2, 637-644 (2014)
11. Anchoring silver with poly(vinylidene fluoride) molecules in model flocculates and its effects on rheology in stable nanofluids By A. D. Phule, S. Ram, A. K. Tyagi *Journal of Nanofluids* 2, 249-260 (2013)
12. “Influence of hydrogen on chemical vapor synthesis of different carbon nanostructures using propane as precursor and nickel as catalyst□? By R. K. Sahoo, H. Mamgain, C. Jacob, *Bulletin of Materials Science* Accepted Aug 28-2013 (2014)

13. Band gap engineered TiO<sub>2</sub> nanoparticles for visible light induced photoelectrochemical and photocatalytic studies. By M. M. Khan, S. A. Ansari, D. Pradhan, M. O. Ansari, D. H. Han, J. Lee, M. H. Cho *J. Mater. Chem A* 2, 637-644 (2014)
14. Biodegradation of Polyester Urethane in Simulated Body Fluid By Basak, P., Adhikari, B. *Polymer - Plastics Technology and Engineering* 52(4), 358-367 (2013)
15. CO Oxidation Activities of Ni and Pd-TiO<sub>2</sub>@SiO<sub>2</sub> Core-Shell Nanostructures By Y. Do, I. Cho, Y. Park, D. Pradhan, Y. Sohn *Bull. Korean Chem. Soc.* 34, 3635-3640 (2013)
16. Compatibilized ethylene-propylene-diene terpolymer nanocomposites containing different type of organoclays By Asish Malas, Chapal Kumar Das *Polimery-Polymers* 58, 204-211 (2013)
17. Consecutive magnetic and magnetocaloric transitions in a Heusler Mn<sub>50</sub>Ni<sub>41</sub>Sn<sub>9</sub> alloy of herringbone nanostructure By Prasanna, A. A., Ram, S. and Fecht, H. -J. *Journal of Nanoscience and Nanotechnology* 13, 5351-5359 (2013)
18. Copolymerization of Lactic Acid for Cost-effective PLA Synthesis and Studies on Its Improved Characteristics By Moumita Bishai, Swarnalok De, Basudam Adhikari, and Rintu Banerjee *Food Sci. Biotechnol.* 22(S): 73-77 (2013)
19. Development and Characterization of Nanoclay-Modified Soy Resin-Based Jute Composite as an Eco-friendly/Green product By Ajaya Kumar Behera, Sridevi Avancha, Ramkrishna Sen, Basudam Adhikari *Polymer-Plastics Technology and Engineering* 52: 833-840 (2013)
20. Development and characterization of plasticized starch-based biocomposites with soy pulp as reinforcement filler By Ajaya Kumar Behera, Sridevi Avancha, Ramkrishna Sen and Basudam Adhikari *Journal of Applied Polymer Science* 127: 4681-4687 (2013)
21. Development of Microwave Absorbing Materials Based on DBSA doped Polyaniline/Pb(Zr 0.52 Ti 0.48 )O<sub>3</sub> Nanocomposites By Avinandan Mandal, Chapal Kumar Das *Macromolecular Symposia* 327, 99-107 (2013)
22. Development of modified expanded graphite-filled solution polymerized styrene butadiene rubber vulcanizates in the presence and absence of carbon black By Asish Malas, Chapal Kumar Das *Polymer Engineering and Science* 54,33-41 (2014)
23. Di-tert-butyl containing semifluorinated poly(ether amide)s: Synthesis, characterization and gas transport properties By P. Bandyopadhyay, D. Bera, S. Ghosh, S. Banerjee *J. Membr. Sci.* Vol.447, pp. 413-423 (2013)
24. Effect of band alignment on photoluminescence and carrier escape from InP surface quantum dots grown by metalorganic chemical vapor deposition on Si By Nripendra N. Halder, P. Biswas, T.D. Das, S.K. Das, S. Chattopadhyay, D. Biswas and P. Banerji *Journal of Applied Physics* 115, 043101 (2014)
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35. Growth and characterization of 3C-SiC nanorods Using Au as a Catalyst, *By Afzal Khan, Chacko Jacob, IUMRS-ICA, Bangalore, (2013)*
36. Growth and characterization of CNTs using nickel and nickel oxide as catalysts by atmospheric pressure chemical vapor deposition, *By Shivam Gupta and Chacko Jacob, 25th AGM of MRSI, Bangalore, (2014)*
37. Growth and Characterization of Cubic-SiC 1D Nanostructures Using Chemically Synthesized Au Nanoparticles, *By Afzal Khan, Chacko Jacob, ICANN, IIT Guwahati, (2013)*
38. Growth of 3C-SiC Nanorods Using Various Catalysts by CVD, *By Afzal Khan, Chacko Jacob, ICFM-2014, IIT Kharagpur, (2014)*
39. Growth of graphene-CNT hybrid nanomaterial using boron carbide as a catalyst, *By Rakesh Sahoo, D Damodar and Chacko Jacob, ICFM-2014, IIT Kharagpur, (2014)*
40. Hexaferrite and MWCNT Based Nanocomposites for Microwave Absorbing Applications, *By Pallab Bhattacharya, C. K. Das, ICFM 2014, IIT Kharagpur, (2014)*

41. High performance fluorinated polymers, By S. Banerjee, *Bayreuth polymer symposium (BPS-13)*, Bayreuth, Germany, (2013)
42. High performance fluorinated polymers: Proton exchange membrane properties, By E. A. Mistri, R. Mukherjee S. Banerjee, *Recent advances in Polymer & Rubber Science & technology (RAPT2014)*, Kolkata, (2014)
43. Highly Electrical Conductive Nanocomposites by selectively dispersion of Carbon Nanotubes in styrene-acrylonitrile, By Nilesh K. Shrivastava and B. B. Khatua, *International Conference on Functional Material 2014 (ICFM-2014)*, IIT Kharagpur, (2014)
44. Impedance properties in magnetic-dielectric Zr<sub>0.8</sub>Cr<sub>0.2</sub>O<sub>2</sub> nanocrystallites, By A. Sengupta and S. Ram, *IEEE Xplore*, (2013)
45. Influence of expanded graphite flakes on the physical and thermo-mechanical properties of natural rubber and solution polymerized styrene butadiene rubber for tire tread applications, By C. K. Das, Asish Malas, *RAPT 2014*, University of Calcutta, (2014)
46. Influence of microstructure on the magnetic properties in nanocrystallites of Zr<sub>1-x</sub>Cr<sub>x</sub>O<sub>2</sub> (x≤0.2), By A. Sengupta and S. Ram, *AIP Conference Proceedings*, (2013)
47. Introduction of Phosphonium Modified Organoclay for the Preparation of Optically Transparent Polycarbonate/Clay Nanocomposites with Improved Performance, By Supratim Suin, Nilesh K. Shrivastava and B. B. Khatua, *International Conference on Functional Material 2014 (ICFM-2014)*, IIT Kharagpur, (2014)
48. Low Cost Membrane Cathode Assembly Fabrication For Simultaneous Electricity Generation and Waste Water Treatment in Single Chambered Microbial Fuel Cells, By S. Pandit, S. Khilari, D. Pradhan, D. Das, *International conference on functional materials*, IIT-Kharagpur, (2014)
49. Manganese Chloride Doped Polyaniline/Single Walled Nanotubes Nanocomposite for Supercapacitor Applications, By Saptarshi Dhibar and C. K. Das, *APM 2014*, CIPET, Bhubaneswar, (2014)
50. Manganese Doped Polypyrrole/Multi-Walled Carbon Nanotubes Nanocomposites for Supercapacitor Applications, By Saptarshi Dhibar and C. K. Das, *IUMRS-ICA 2013*, IISC Bangalore, (2013)
51. Microstructure and electrical conductivity in antiferromagnetic Fe<sub>3</sub>BO<sub>6</sub> nanoplates with a bonded carbon surface layer, By K. Kumari, S. Ram, and R. K. Kotnala, *International Conference on Functional Materials*, IIT, Kharagpur, (2014)
52. Modification of CNT and its effect on Thermo mechanical, Morphological, Rheological properties of PEI/LCP blend system, By Goutam Hatui, Prof. C. K. Das, *ICRRM 2013*, IIT Kharagpur, (2013)
53. Multifunctional nano-crystalline lanthanum ferrite for low temperature butane sensing, By K. K. Bhargav, S. B. Majumder and S. Ram, *10th National Conference on Solid State Ionics*, IIT, Kharagpur, (2013)
54. Nanostructures of carbon-based materials - beauty, form and function (invited talk), By Chacko Jacob, *Recent Trends in Condensed Matter Physics (RTCMP OPS-31)*, ITER (SOA), Bhubaneswar, (2014)
55. Novel Application of Jute in Value Added Products, By Basudam Adhikari, *International Conference on Advances in Polymeric Materials*, CIPET, Lucknow, (2013)
56. Novel aromatic polyamides containing pendant adamantane moiety for gas separation application, By D. Bera, S. Banerjee, *International Conference on Functional Materials (ICFM 2014)*, IIT Kharagpur, (2014)
57. Novel fluorinated sulfonated poly(arylene ether sulfone)s copolymers with side chain grafting: Proton exchange membrane materials, By R. Mukherjee, S. Banerjee, *International Conference on Functional Materials (ICFM 2014)*, IIT Kharagpur, (2014)
58. Novel fluorinated sulfonated polytriazole and their proton exchange membrane properties, By A. Singh, S. Banerjee, *International Conference on Functional Materials (ICFM 2014)*, IIT Kharagpur, (2014)
59. Performance of MnO<sub>2</sub>/polypyrrole nanocomposite for oxygen reduction reaction catalyst in a single chambered microbial fuel cell, By S. Khilari, D. Pradhan, *International conference on functional materials*, IIT-Kharagpur, (2014)

60. Polymer Membrane: A selective and stable chemical sensor for aliphatic alcohol, By M. Mahato, T. Sinha, B. Adhikari, *INTERNATIONAL CONFERENCE ON FUNCTIONAL MATERIALS (ICFM)*, IIT Kharagpur, (2014)
61. Polystyrene/MWCNT/Graphite Nanoplate Ternarycomposites: Efficient EMI Shielding Materials, By Sandip Maiti and B. B. Khatua, *International Conference on Functional Material 2014 (ICFM-2014)*, IIT Kharagpur, (2014)
62. Role of mineral acid on poly (aniline-co-m-aminobenzoic acid) synthesis and doping effect on ester sensing properties, By Jyoti Singh, R. Banerjee and B. Adhikari, *INTERNATIONAL CONFERENCE ON ADVANCEMENTS IN POLYMERIC MATERIALS (APM-14)*, CIPET, Bhubaneswar, (2014)
63. Selective carbon monoxide sensing by cobalt modified lanthanum ferrite multifunctional nano-crystals at lower operating temperature, By K. K. Bhargav, S. B. Majumder and S. Ram, *International Conference on Functional Materials*, IIT, Kharagpur, (2014)
64. Semifluorinated sulfonated high performance polymers for proton exchange membrane materials, By S. Banerjee, *3rd FAPS polymer congress and MACRO-2013*, IISC, Bangalore, (2013)
65. Silver Nanoparticles Decorated Polyaniline/MWCNTs Nanocomposite for Supercapacitor Applications, By Saptarshi Dhibar and C. K. Das, *ICFM 2014*, IIT Kharagpur, (2014)
66. Single walled carbon nanotube and Graphene based nanocomposites for high Performance Electromagnetic wave Absorbing Applications, By C. K. Das, *Nanoscience in Ballistics*, FM University, (2014)
67. Surface microstructure and impedance properties of Fe<sub>3</sub>BO<sub>6</sub> nanoplates, By K. Kumari, S. Ram, and R. K. Kotnala, *10th National Conference on Solid State Ionics*, IIT, Kharagpur, (2013)
68. Synthesis and characterization of acrylic acid (AA) based polyaniline (PANI) conducting polymer, By Muktikanta Panigrahi and Basudam Adhikari, *INTERNATIONAL CONFERENCE ON ADVANCEMENTS IN POLYMERIC MATERIALS (APM-14)*, CIPET, Bhubaneswar, (2014)
69. Synthesis and Characterization of new processable fluorene-based poly(arylene ether)s, By S. Saha, E. Mistri, S. Banerjee, *International Conference on Functional Materials (ICFM 2014)*, IIT Kharagpur, (2014)
70. Synthesis and characterization of uniform size gold nanoparticle by using different protein like chymotrypsin and egg albumin, By Shyamal Mandal, Chacko Jacob and Soumen Das, *ICANN*, IIT Guwahati, (2013)
71. Synthesis and magnetotransport properties of Co<sub>36</sub>.6Ag<sub>63</sub>.4 core-shell core-shell nanocomposite, By S.S. Kalyan Kamal, J. Vimala, P.K. Sahoo, P. Ghosal, M. Manivel Raja, L. Durai and S. Ram, *Magnetic Materials and Applications (MagMA-2013)*, IIT Guwhati, (2013)
72. Temperature dependent dielectric properties of Fe<sub>3</sub>BO<sub>6</sub> nanoplates, By K. Kumari, S. Ram, and R. K. Kotnala, *DAE-BRNS 7th National Symposium on Pulsed laser deposition on Thin Films and Nanostructured Materials*, IIT, Kharagpur, (2013)
73. Template-free surfactant-less hydrothermal synthesis of In<sub>2</sub>S<sub>3</sub> microspheres with sheet-like/brick-like subunits and their photocatalytic activity, By A. K. Nayak, D. Pradhan, *A National Seminar On NANOSCIENCE IN BALLISTICS*, FAKIR MOHAN UNIVERSITY, BALASORE, ODISHA, (2014)
74. Triphenyl moiety containing non-fluorinated sulfonated aromatic polyimides for proton exchange membrane, By A.G. Kumar, D. Bera, S. Banerjee, *International Conference on Functional Materials (ICFM 2014)*, IIT Kharagpur, (2014)
75. Ultrasonic welding of amorphous and semi crystalline materials, By C. K. Das, *JCMST 2013*, Hongkong China, (2013)



## Reliability Engineering Centre

### **Head**

Prof. V N Achutha Naikan

### **Professor**

Naikan, V N Achutha *Ph.D.(IIT Kharagpur)*, Reliability and Quality Engineering, Condition Monitoring, System Simulation

### **Associate Professor**

Chaturvedi, Sanjay Kumar *Ph.D.*, Maintenance Engineering, System Reliability Modelling and Analysis, Reliability Data Analysis, Reliability Estimation

### **Assistant Professors**

Goyal, Neeraj Kumar *Ph.D.(IIT Kharagpur)*, Software Reliability, System Reliability Analysis, Probabilistic Risk Assessment, Network Reliability, Accelerated Life Testing

Sarma, Monalisa *Ph.D.(IIT Kharagpur)*, Software reliability, Big data analysis, Cloud computing

### **Faculty Appointments**

Monalisa Sarma Assistant Professor

### **Brief Description of on-going activities**

The Centre is developing a Virtual Lab on fault Diagnosis of Rotary Systems. This lab will be useful for virtually creating certain faults in rotating systems and then diagnose the fault and its severity. The Research activities are now focusing more on experimental research. Accelerated life testing on various engineering components and systems are being carried out in our laboratory. Other activities include organizing short term courses on latest topics of Reliability Engineering for officers and engineers of the Industry, Defense Organizations and R & D Establishments. Safety and reliability studies of nuclear power plants and missile systems are other activities. Reliability Availability Maintainability and safety (RAMS) aspects of Indian Railways is another focus area.

### **Thrust Areas**

1. Software Reliability and Cloud computing
2. Condition Monitoring and Maintenance
3. Reliability Testing and Estimation
4. Probabilistic Risk and Safety Analysis

### **International Collaborations**

Collaborative Research work on "Software Reliability Modelling" with DNV Norway is progressing

### **Lectures by Visiting Experts**

1. Reliability of Repairable Systems by Dr. A. Syam Sundar (Vishakhapatnam Steel Plant)
2. Reliability Engineering research in Indian Scenario by Dr. Edwin Vijay Kumar (Vishakhapatnam Steel Plant)

### ***Member - Professional Bodies***

1. Chaturvedi, Sanjay Kumar, *Life* - ISTE
2. Chaturvedi, Sanjay Kumar, *Member* - IEEE
3. Chaturvedi, Sanjay Kumar, *LIFE MEMBER* - SERSA
4. Goyal, Neeraj Kumar, *Life Member* - Society for Reliability and Safety
5. Goyal, Neeraj Kumar, *Life Member* - SYSTEMS SOCIETY OF INDIA
6. Naikan, V N Achutha, *Member* - IEEE Society
7. Naikan, V N Achutha, *Regular* - Institution of Engineers (India)
8. Naikan, V N Achutha, *Life Member* - Society for Reliability and Safety
9. Naikan, V N Achutha, *Regular* - IEEE Reliability Society
10. Naikan, V N Achutha, *Member* - System Society of India

### ***Member - Editorial Board***

1. Chaturvedi, Sanjay Kumar (2014) *Member Group 2 of Editorial Board* - International Journal of Performability Engineering
2. Goyal, Neeraj Kumar (2012) *Member* - Life Cycle Reliability and Safety Engineering
3. Goyal, Neeraj Kumar (2012) *Reviewer* - International Journal of Performability Engineering
4. Goyal, Neeraj Kumar (2013) *Associate Editor* - International Journal of Performability Engineering
5. Goyal, Neeraj Kumar (2013) *Reviewer* - Central European Journal of Computer Science
6. Goyal, Neeraj Kumar (2013) *Reviewer* - Software Testing, Verification and Reliability
7. Goyal, Neeraj Kumar (2013) *Reviewer* - Defence Science Journal
8. Goyal, Neeraj Kumar (2013) *Reviewer* - Quality and Reliability Engineering International
9. Goyal, Neeraj Kumar (2012) *Reviewer* - International Journal of Automation and Computing
10. Naikan, V N Achutha (2010) *Reveiwer* - International Journal of Production Research
11. Naikan, V N Achutha (2010) *Reviewer* - Journal of Loss Prevention in the Process Industries
12. Naikan, V N Achutha (2009) *Reviewer* - Computers and Industrial Engineering
13. Naikan, V N Achutha (2010) *Reviewer* - Defence Science Journal
14. Naikan, V N Achutha (2012) *Member, Advisory board* - SRESA Journal of Life Cycle Reliability and Safety Engg
15. Naikan, V N Achutha (2009) *Reviewer* - International Journal of Performability
16. Naikan, V N Achutha (2010) *Reviewer* - Society for Mining, Metallurgy, and Exploration, Inc
17. Naikan, V N Achutha (2009) *Reviewer* - International Journal of Quality and Reliability Management
18. Naikan, V N Achutha (2012) *Asia Pacific Editor* - International Journal of Performability Engineering
19. Naikan, V N Achutha (0) *Ediorial Board Member* - Intl. jl. of Systems Assurance and Management

### ***Awards & Honours***

1. Sarma, Monalisa (2012) *IBM SUR Award, IBM Research Corpn, USA*

### ***Sponsored Research Projects***

1. Reliability modeling, Analysis and Prediction of 21 NA (Absolute) Pressure Transducers (ISRO, Rs.8.40 Lakhs)
2. Rotating Machinery fault Simulation lab (MHRD, Rs.52.00 Lakhs)
3. Standardization of Virtual Keyboards in Indic Languages (Department of Electronics and Information Technology (DeitY), New Delhi, Rs.22.00 Lakhs)

### ***Consultancy Projects***

1. Hazard Identification and Risk Assessment of Industrial Activities (ITR, Chandipur, Rs.9.50 Lakhs)
2. RAMS for Garuda (DRDL Hyderabad, Rs.20.00 Lakhs)
3. Reliability analysis of Permanent magnet machine set and its associated controller' (BHEL, Rs.6.60 Lakhs)
4. Reliability Assessment and Improvement (Secure Meters Limited, Rs.3.51 Lakhs)
5. Reliability Improvement of Metering Products ( Larsen& Toubro, Mysore, Rs.10.00 Lakhs)
6. RELIABILITY MODELING AND PREDICTION OF PROCESS CONTROL SYSTEM (DRDO Panagarh, Rs.8.03 Lakhs)
7. Reliability Prediction and FMEA/FMECA of CFF Oxygen System (DEBEL, Bangaluru, Rs.10.00 Lakhs)
8. Reliability Prediction and Testing of Electrical Products (Crompton and Greaves, Mumbai, Rs.10.00 Lakhs)
9. Reliability Work Package for Missile Project: Phase II (DRDL, Hyderabad, Rs.12.50 Lakhs)

### ***Patents (filed / granted)***

1. Efficient Binary Trie for Application to Medical Electronic Dictionary in Health Care

### **Visits Abroad by Faculty Members**

1. Naikan, V N Achutha - Visiting Professor (University of Maryland, USA, ) 13-01-2013 to 30-06-2013

### **Invited Lectures by Faculty Members**

1. Maintainability Analysis *by* Naikan, V N Achutha (ESCI, Hyderabad)
2. RAMS for Railway Systems *by* Naikan, V N Achutha (DLW Varanasi)
3. Reliability Engineering and Life Testing *by* Naikan, V N Achutha (PSGCT, Coimbatore)
4. Reliability Centred Maintenance *by* Goyal, Neeraj Kumar (DRDO Panagarh)
5. Failure Distributions and Reliability Modeling *by* Goyal, Neeraj Kumar (IMRT Hyderabad)

### ***Short-Term Courses, Training Programmes and Workshops organised***

1. Reliability Modeling of Sensors Network System for Critical Applications IV (December 09-14, 2013)

### ***Papers Published in Journals***

1. Book Review on Life Cycle Reliability Engineering *By* V.N.A. Naikan *Microelectronics Reliability* pp (2013)
2. CSLAT: An SLA Template for Cloud Service Management *By* Dheeraj Rane and Monalisa Sarma *International Journal of Communication Networks and Distributed Systems* Accepted in 2014 (0)
3. Design of 4-disjoint gamma interconnection network layouts and reliability analysis of gamma interconnection Networks *By* S. Rajkumar and Neeraj Kumar Goyal *Journal of Supercomputing* Accepted (2014)
4. Fuzzy Arithmetic based Reliability Allocation Approach during Early Design and Development *By* Venu Sriramdas, S. K. Chaturvedi and Heeralal Gargama *Expert Systems with Applications* 41(7) (2013)

5. Multi Phase Reliability Analysis with Variable Phase duration and Variable Phase Sequence By Sarma P. S., S. K. Chaturvedi, Damodar Garg and Sudhangshu Chakravorty *Reliability: Theory and Application* 8(4) (2013)
6. Multi Phase System Reliability Analysis using Excel By Sarma P. S., S. K. Chaturvedi, Damodar Garg and Sudhangshu Chakravorty *International Journal of Performability Engineering* 10(2) (2014)
7. Out of range error probability assessment for any computer program By Sushant Mohan Dewal and Neeraj Kumar Goyal *International Journal of Reliability and Safety* 7(4) pp 332-357 (2013)
8. Reliability Analysis of Temperature Sensor System By Swajeet Pilot Panchangam and V.N.A. Naikan *International Journal of Reliability Quality and Safety Engineering* Vol 20, pp1 - 20 (2013)
9. Reliability Modeling of Rotary Systems Subjected to Imbalance By V.M.S. Hussain and V.N.A. Naikan *International Journal of Performability Engineering* Vol. 9, pp 423-432 (2013)
10. Reliability-based Design Optimization of Broad-band Microwave Absorbers By H. Gargama, S. K. Chaturvedi, A. K. Thakur *Journal of Electromagnetic Waves and Applications* 27 (11) (2013)
11. Reliability-based design optimization scheme for designing electromagnetic shielding structures By H. Gargama, S. K. Chaturvedi, and A. K. Thakur *Journal of Electromagnetic Waves and Applications* 28(6) (2014)
12. Security Monitoring and Assessment of an Electric Power System By PUROBI PATOWARY and NEERAJ KUMAR GOYAL *International Journal of Performability Engineering* Accepted (2014)
13. Techniques for optimal placement of transducers for fault detection in rotating machines By Fatima Sahab, Amiya Ranjan Mohanty, Sabyasachi G Dastidar and V.N.A. Naikan *Proceedings of the Institution of Mechanical Engineers, part O, Journal of Risk and Reliability* 227 (2), pp119-131 (2013)

#### ***Papers Presented in Conferences***

1. Accelerated Life Testing of Aluminum Electrolytic Capacitors: Effect of Applied Voltage on Life, By Arvind Rathore and V.N.A. Naikan, *SRESA National Conference on Reliability and Safety Engineering*, Thiruchirapally, (2014)
2. Effective time domain features for distinguishing coupling effects on misaligned shaft, By Fatima Sahab, Amiya Ranjan Mohanty and V.N.A. Naikan, *Proceedings of Acoustics*, New Delhi, (2013)
3. Environmental Study on Battery Performance at Low Temperature, By Bhavdeep Mago and V.N.A. Naikan, *SRESA National Conference on Reliability and Safety Engineering*, Thiruchirapally, (2014)
4. Most Effective Transducer Locations for Permanent Health Monitoring of A Rotating Machine, By S. Fatima, A. R. Mohanty and VNA Naikan, *20th International Congress on Sound and Vibration*, Bangkok, (2013)
5. Multiple fault classification using support vector machine in a machinery fault simulator, By Fatima Sahab, Amiya Ranjan Mohanty and V.N.A. Naikan, *10th International Conference on Vibration Engineering and Technology of Machinery*, Manchester, UK, (2013)
6. Shaft misalignment detection by thermography, By Fatima Sahab, Amiya Ranjan Mohanty and V.N.A. Naikan, *21th International Congress on Sound and Vibration*, Beijing, China, (2014)
7. Virtual Fault Simulation for Sympathetic Vibrations of Rotating Machine, By Dipti Prakash Behera and V.N.A. Naikan, *IEEE International Advance Computing Conference (IACC)*, Noida, (2014)

## Rubber Technology Centre

### **Head**

Prof. Dipak Khastgir

### **Professors**

Bhowmick, Anil Kumar

*Ph.D.(IIT Kharagpur),*

Chaki, Tapan Kumar

*Ph.D.(IIT Kharagpur),* Electron beam modification of polymers, Polymer nanocomposites, Conductive rubber composites for EMI shielding application of Mobile phones and mobile towers, Waste plastics modified bitumen for highway application, Dielectric elastomer for smart functions, High Performance composite as friction materials, Shape Memory Polymer Nanocomposites

Das, Narayan Chandra

*Ph.D.(IIT Kharagpur),* Polymer nanocomposites, Conductive polymer/polymer composites and EMI shielding materials, Biodegradable polymer and polymer composites, Rheology/morphology and phase behaviour of polymer blends, Small angle X-ray and neutron scattering (SAXS/SANS) on polymers/nanomaterials/ protein/virus, Carbon nanotubes: synthesis/characterization/processing, Thermoplastic elastomers, Conjugated polymers for renewable energy application

Khastgir, Dipak

*Ph.D.(IIT Kharagpur),* Development of Polymer & Composites for Graded Dielectrics and High Voltage Insulation application, Polymer Composites & Nano Composites for Electrical and Electronic applications, Textile Technology for Rubber Product and Protection against Biodegradation

Nando, Golok Behari

*Ph.D.(IIT Kharagpur),* Polymer Blends and Polymer Nano-Composites, Chemical modification and Grafting of Rubbers and additives, TPEs and TPVs from waste polymers and Rubbers, Rubber in strategic areas of applications such as in Automotive tyres Cables and Railways

### **Associate Professors**

Chattopadhyay, Santanu

*Ph.D.(IIT Kharagpur),* Viscoelasticity of rubber composites and polymer based nanocomposites, Synthesis and application of block copolymers and hydrogels for drug delivery, Preparation and evaluation of thermoelectric / stimuli-responsive nanocomposite materials, Self-assembled nanostructures for controlled delivery

Naskar, Kinsuk

*Ph.D.(Univ.of Twente, The Netherlands),* Polymer blends and composites, High performance Thermoplastic elastomers (TPEs) and Thermoplastic vulcanizates (TPVs), Electron beam (EB) processing of polymers and elastomers, Green Tyre Technology, Shape memory polymer alloys

Singha, Nikhil Kumar

*Ph.D (IIT Bombay),* Tailor-made polymers via Controlled Radical Polymerization, Block (AB & ABA) & graft copolymers, Smart self-healing and self-cleaning polymeric materials, Tailor-made polymer nanocomposites, Thermoplastic elastomers (TPE), Polyurethane, Tailor-made modification on elastomers

***Faculty Appointments***

Nil

Nil

Nil

***Faculty Retirement***

Nil

***Faculty Re-employment***

Nil

***Faculty Resignation***

Nil

***New Academic Programmes***

Nil

***Brief Description of on-going activities***

The Centre works in close collaboration with other departments and centers of this Institute and other R & D organizations in India and abroad. Several research projects sponsored by different agencies are in operation. The faculty members are engaged in different research areas : (1) Polymer composites and nanocomposites (2) Chemical modification of rubbers, (3) Thermoplastic elastomers based on novel blends and alloys, (4) Recycling of rubber waste (5) Ionomers, (6) Conductive rubber composites for electrical and electronics application, (7) Electron beam modification of polymers (8) Rheology and processability of rubber compounds and polymer blends, (9) Polymer foam and microcellular rubber composite for various critical and industrial applications, (10) Development of rubber blends and composites for different industrial application like cable, oil seal, tank track pad, vibration isolators, high voltage insulators (11) Development of adhesives and coatings. (12) Development of biodegradable polymer and recycling of rubber and polymer (13) Controlled radical polymerization, (14) Development of polymers for, biomedical application, electronic application. Centre will initiate two research projects under Centre for Railway Research (CRR), IIT Kharagpur.

***Thrust Areas***

1. i) Rubber product design & development ii) Polymer blends and polymer (nano)composites iii) Synthesis of tailor-made polymers and modification polymers/rubbers iv) Green approach in polymer synthesis and technology v) Smart polymer & nanocomposites in novel applications; electrical, electrical, self-healing & biomedical applications vi) Recycling of polymers and rubbers

***New Acquisitions***

1. 1. DSC/TGA 2. Optical microscopy 3. Goniometer 4. Magneto Rheometer 5. GPC 6. Dynamic light scattering analyzer 7. Electrochemical Workstation. 8. Modulated DSC.

### ***Lectures by Visiting Experts***

1. Conductive Polymer Composites by Dr. Sudip Ray (University of Auckland, New Zealand)
2. Advances in Carbon Black Technology by Dr. S. Chakraborty (President, Himadri Chemicals Ltd., Hoogly W.B. India)

### ***Doctoral and MS Degrees Awarded***

1. Shibulal G.S. : Influence of a Multifunctional Coupling Agent on Aramid Short Fiber Reinforced Thermoplastic Elastomers(Ph.D)
2. Nabarun Roy : Synthesis, Characterization and Properties of Crosslinked Liquid Silicone Rubber based Nanocomposites with Fibrous Nanofillers(Ph.D)

### ***Member - Professional Bodies***

1. Singha, Nikhil Kumar, *Life Member* - Life Member of Chemical Research Society of India (CRSI)
2. Singha, Nikhil Kumar, *Member* - American Chemical Society (ACS), Rubber Division, USA
3. Singha, Nikhil Kumar, *Life Member* - Life Member of Society of Polymer Science of India
4. Singha, Nikhil Kumar, *Life Member* - Life Member of Materials Research Society of India (MRSI)
5. Chattopadhyay, Santanu, *Member* - Materials Manufacturing Ontario (Ontario, Canada)
6. Chattopadhyay, Santanu, *Life Member* - Society for Polymer Science, India
7. Chaki, Tapan Kumar, *Life* - Indian Rubber Institute, India
8. Chaki, Tapan Kumar, *Life* - Plasma Science Society of India
9. Chaki, Tapan Kumar, *Life* - Society of Polymer Science
10. Chaki, Tapan Kumar, *Life* - Indian Thermal analysis Society, India
11. Chaki, Tapan Kumar, *Life* - Materials Research Society of India
12. Nando, Golok Behari, *Regular* - American Chemical Society, Rubber Division, Akron, Ohio, USA
13. Nando, Golok Behari, *Life* - Materials Research Society of India,
14. Nando, Golok Behari, *Life* - Society for Polymer science , India
15. Nando, Golok Behari, *Regular member* - Indian Rubber Institute
16. Nando, Golok Behari, *Life* - Indian Association for Radiation Protection
17. Khastgir, Dipak, *Life Member* - Polymer Society of India
18. Khastgir, Dipak, *Member* - American Chemical Society, Rubber Division.
19. Khastgir, Dipak, *Life Member* - Indian Thermal Analysis Society
20. Das, Narayan Chandra, *Member* - American Chemical Society
21. Das, Narayan Chandra, *Member* - Americal Physical Society
22. Das, Narayan Chandra, *Member* - Neutron Scattering Society of America
23. Das, Narayan Chandra, *Associate Member* - Sigma Xi: The Scientific Research Society

### ***Member - Editorial Board***

1. Das, Narayan Chandra (0) *Editorial Board Member* - Advances in Nanoparticles
2. Nando, Golok Behari (2010) *Associate Editor* - International Journal of Current Chemistry
3. Singha, Nikhil Kumar (0) *Member of the Editorial Board* - American Journal of Macromolecular Science
4. Singha, Nikhil Kumar (0) *Member of the Editorial Board* - Frontiers in Chemistry (Polymer Chemistry Section)

### ***Awards & Honours***

1. Singha, Nikhil Kumar (2013) *Fulbright-Nehru Senior Research Fellowship by USA-India Educational Foundation (USIEF)*
2. Singha, Nikhil Kumar (2013) *MRSI Medal by Material Research Society of India (MRSI)*
3. Khastgir, Dipak (2013) *TWAS ASSOCIATESHIP*

### ***Sponsored Research Projects***

1. Application of nanotechnology for improving impermeability of gas and moisture of TBR/PCR inner liner materials (CEAT Tyres, Mumbai, Rs.24.00 Lakhs)
2. Application of TPE-General Purpose Elastomer Blends for Use in PCR and TBR Tyres (CEAT Tyre, Vadodara, Rs.23.42 Lakhs)
3. Development and failure analysis of outdoor high voltage insulators from Silicone rubber and Silicone rubber blends used by Indian Railways (RDSO, Lucknow, Rs.78.96 Lakhs)
4. Development of Composition and Standardization of Properties of Composites Brake Blocks for Application of Coaches of Indian Railways (RDSO, Lucknow, Rs.77.00 Lakhs)
5. Development of Novel Polymeric Materials for Self-healing Applications (PSA) (DRDO, Rs.16.00 Lakhs)
6. Development of radiation processed flexible conductive rubber based composites for electromagnetic interference shielding applications of mobile phone (BRNS, Mumbai, Rs.24.94 Lakhs)
7. Development of Rubber Nanocomposite base encapsulant (NPOL, DRDO, Kochin, Rs.9.90 Lakhs)
8. Development of shape memory polymer blends via radiation cross-linking (DAE, BARC, Mumbai, Rs.19.46 Lakhs)
9. Development of Shape Memory Polymer Nanocomposites (SMPN) for Space Deployable Material (NSD) (KCSTC, IIT Kharagpur, Rs.10.96 Lakhs)
10. Development of special purpose heat resistant cable insulating compounds based on blends of LLDPE and PDMS rubber by electron beam irradiation techn (Department of Atomic Energy, BARC, Trombay, Mumbai, Rs.13.11 Lakhs)
11. Exploring silica-filled ENR in tyre application: a novel Green Technology (DST, New Delhi, Rs.39.05 Lakhs)
12. Novel heat and oil resistant thermoplastic Vulcanizates (TPVs): development, characterization and performance (Council of scientific and industrial research, New Delhi, Rs.18.38 Lakhs)
13. Novel Microporous polymeric membranes for medical applications (Department of BioTechnology, Ministry of Science and Technology, Govt of India, Rs.34.44 Lakhs)
14. Novel Polymers by Controlled Radical Ring Opening Polymerization (CRROP) of Vinyl Cycloalkane (NVC) (DST, New Delhi, Rs.23.08 Lakhs)
15. Preparation and characterization of PVC-Silicone blends (DRDO, New Delhi, Rs.24.57 Lakhs)
16. Segmented Polyurethane Laponite clay nano composites for fire and flammability (ISRO, Bangalore, Rs.10.52 Lakhs)
17. Shape Memory Polymer Nanocomposites (Kalpana Chawla Space Technology Cell, Rs.10.97 Lakhs)
18. Study on Improvement of Adhesion of EPDM based Nanocomposites in Solid Rocket Thermal Insulation Application (KCSTC, IIT Kharagpur, Rs.14.26 Lakhs)
19. Tailor-made fluoropolymers using controlled radical polymerization (CSIR, New Delhi, Rs.20.28 Lakhs)
20. Thermoplastic Elastomers based on Polymer Blends and their Nanocomposites (Bridgestone Corporation, Japan, Rs.3.50 Lakhs)



### ***Consultancy Projects***

1. Characterization of Emulsion samples (CESP) (Asian Paints Limited, Rs.0.80 Lakhs)
2. Development of Conveyor Compound (IBBU) (TATA Steel Jamshedpur, Rs.10.50 Lakhs)
3. Development of Elastomeric Bearings (Hindustan Aeronautics Limited(HAL), Foundry and Forge Division, Bangalore India, Rs.2.25 Lakhs)
4. Development of heat Exchanger Gaskets for Food and Non-food grade applications (Vikas Rubber Industries, New Delhi, Rs.2.19 Lakhs)
5. Development of Two Part Compound for conveyor belt (Phoenix Yule, Kalyni, Rs.3.20 Lakhs)
6. Estimation of Rubber content (Modern Malleables Limited, Kolkata, Rs.0.28 Lakhs)
7. Failure analysis of adhesive joints (TISCO Jamshedpur, Rs.10.00 Lakhs)
8. Identification of polymers (Prag Industries Limited, Lucknow, Rs.0.15 Lakhs)
9. Thermoplastic Elastomers based on Polymer Blend and Their Nanocomposites(BBAT) (Bridgestone Corporation, Tokyo, Japan, Rs.3.68 Lakhs)
10. To identify and test rubber compounding ingredients from sustainable sources (GECN) (LANXESS Elastomers B.V., The Netherlands, Rs.6.43 Lakhs)

### ***Patents (filed / granted)***

1. A Polyimide Filled EPDM Nanocomposite
2. A Process for the preparation of capacitative barium titanate nanoleaves
3. A single pot process for polar modification on polyolefinic elastomers via tailor-made graft copolymerization
4. Bromobutyl Rubber-Homopolymer of Epichlohydrin blended rubber nanocomposites
5. Development of novel light rocket motor insulation compound based on Polyimide – nanosilica filled EPDM-BIIR
6. Elastomer Nanocomposites based on Insulation Material for Rocket Motors
7. Method for producing thermoplastic polymer compounds
8. Synergistic combination of dual dopants for improved electrical conductivity in conducting polymer

### **Visits Abroad by Faculty Members**

1. Khastgir, Dipak - To present paper and chair a session in Int. Conference on Advances of Polymer Science & Technology (Yogyakarta Indonesia, ) 7-10 October, 2013
2. Chattopadhyay, Santanu - Attending ICMAT-2013 (Singapore, ) 30th June -6th July, 2013
3. Chaki, Tapan Kumar - To present paper in Nano Energy 2014 (University College of London, UK, ) 19-21 February, 2014
4. Singha, Nikhil Kumar - Fulbright-Nehru Senior Research Fellowship (The University of Tennessee, Knoxville, USA, ) 5th August,2013- 3rd April, 2014

### **Invited Lectures by Faculty Members**

1. Novel Thermoplastic Elastomeric Nanocomposites *by* Chaki, Tapan Kumar (Haldia Institute of Technology, Haldia)
2. Ablative polyimide based EPDM nanocomposites *by* Chaki, Tapan Kumar (University of Calcutta, Kolkata, India.)
3. Polymer Cable Technology *by* Khastgir, Dipak (Indian Rubber Institute, Mysore)
4. An approach to improve technical properties of TPEs *by* Chattopadhyay, Santanu (National Rubber Conference, Kolkata)
5. Synthesis and Morphological Study of Branched PE-PCL Immobilized Biocompatible Superparamagnetic NC *by* Chattopadhyay, Santanu (FAPS-MACRO, IISC, Bangalore)

6. Tailor made Functional Polymer and its Composites via Controlled Polymerization & Click Chemistry by Singha, Nikhil Kumar (University of Akron, USA)
7. Tailor made Functional Polymers by Controlled/living Polymerization & Click Chemistry by Singha, Nikhil Kumar (Oak Ridge National Laboratory, Tennessee, USA)

### **Books Published**

1. I. Suryakanta Nayak, Tapan Kumar Chaki, Dipak Khastgir: Polymer-ceramic composites as dielectric and piezoelectric material published by □?, LAP LAMBERT Academic Publishing, OmniScriptum GmbH & Co. KG, Heinrich- (2013)

### **Papers Published in Journals**

1. A mechanistic study on electromagnetic shielding effectiveness of polysulfone/carbon nanofibers nanocomposites By L Nayak, D Khastgir, TK Chaki *Journal of Materials Science* 48 (4), 1492-1502 (2013)
2. Aging of low-density polyethylene in natural weather, underground soil aging and sea water: Effect of a starch-based prodegradant additive By M. Elanmugilan, P. A. Sreekumar, N. K Singha, M. A. Al-Harhi, S. K.De, Polymer Engineering & Science, *Polymer Engineering & Science*, 53(11), 2389-2397 (2013)
3. Atom Transfer Radical Polymerization of Glycidyl Methacrylate (GMA) in Emulsion By D. J. Haloi, P. Mandal, N. K. Singha *Journal of Macromolecular Science Part A Pure and Applied Chemistry* 50, 120–127 (2013)
4. Contribution of organomodified clay on hybrid microstructures and properties of epoxidized natural rubber-based nanocomposites By P. K. Chattopadhyay, S. Praveen, N. C. Das, S. Chattopadhyay *Polymer Engineering and Science* 53, 923 (2013)
5. Control of the temperature coefficient of the DC resistivity in polymer-based composites By Rahaman, Mostafizur Chaki, Tapan Kumar Khastgir, Dipak, *Journal of Materials Science* 48(21), 7466-7475 (2013)
6. Copper Catalyzed Ring Opening Copolymerization of a vinyl Cyclopropane and Methyl methacrylate By Souvik Ata, D.R. Mal, Nikhil K. Singha, *RSC Advances* 3, 14486–14494 (2013)
7. Development of Poly (dimethylsiloxane)/BaTiO<sub>3</sub> Nanocomposites as Dielectric Material By S Nayak, T Kumar Chaki, D Khastgir *Advanced Materials Research* 622, 897-900 (2013)
8. Development of poly (dimethylsiloxane)–titania nanocomposites with controlled dielectric properties: Effect of heat treatment of titania on electrical properties By S Nayak, M Rahaman, A K Pandey, DK Setua, TK Chaki, D Khastgir *Journal of Applied Polymer Science* 127 (1), 784-796 (2013)
9. Development of polyimide–nanosilica filled EPDM based light rocket motor insulator compound: Influence of polyimide–nanosilica loading on thermal, ablation, and mechanical properties By Sangita Singh, P.K.Guchhait, T.K.Chaki, G.G.Bandopadhyay *Composites: part A* 44, 8-15 (2013)
10. Development of polyurethane–titania nanocomposites as dielectric and piezoelectric material By Suryakanta Nayak , Banalata Sahoo , Tapan Kumar Chaki and Dipak Khastgir *RSC Advances* 3, 2620-2631 (2013)
11. Different Nanofillers based Polyimide filled EPDM Compound for High Temperature Insulation, Structure and Property By Sangita Singh, P K Guchhait, N K Singha, T K Chaki *American Journal of Macromolecular Science* Doi - 10-7726-2013 (2014)
12. Effect of ageing on different modified bituminous binders: comparison between RTFOT and radiation ageing By Naskar, M. Reddy, K. S. Chaki, T. K. Divya, M. K. Deshpande, A. P *Materials and Structures* 46,7,1227-1241 (2013)
13. Effect of Plasticizer and Curing System on Freezing Resistance of Rubbers By Oh, Jaeho Yoo, Yong Hwan Yoo, Il-Sou Huh, Yang-II Chaki, Tapan Kumar Nah, Changwoon *Journal of Applied Polymer Science* 131, (2), 39795/1-39 (2014)

14. Electrochemical synthesis of nanostructured polyaniline: Heat treatment and synergistic effect of simultaneous dual doping By S. Bhandari, N. K. Singha, D. Khastgir *J. Appl. Polym. Sci.*, 129(3) 1264-1273 (2013)
15. EPDM and NR-based TPVs via electron induced reactive processing By U. Gohs, M. Mondal, V. Thakur, K. Naskar and G. Heinrich *TPE Magazine* 01, 37 (2014)
16. Facile preparation of uniform barium titanate (BaTiO<sub>3</sub>) multipods with high permittivity: impedance and temperature dependent dielectric behavior By Nayak, Suryakanta Sahoo, Banalata Chaki, Tapan Kumar Khastgir, Dipak *RSC Advances* 4(3) 1212-1224 (2014)
17. Maleic anhydride grafted Polybutadiene as a Controlled Defibrillating and Dispersing Agent for Short Aramid Fiber Reinforced Thermoplastic Polyurethane Composite with Improved Mechanical Properties By G. S. Shibulal and K. Naskar\* *Journal of Applied Polymer Science* 130, 2205 (2013)
18. Mechanical, electrical, and dielectric properties of polyvinylidene fluoride/short carbon fiber composites with low  $\phi_c$  electrical percolation threshold By R Ram, M Rahaman, D Khastgir *Journal of Applied Polymer Science* 131 (3) (2014)
19. Morphology and cyclic voltammetry analysis of in situ polymerized polyaniline/graphene composites By DK Mahla, S Bhandari, M Rahaman, D Khastgir *Journal of Electrochemical Science and Engineering* 3 (4), 157-166 (2013)
20. Natural weather, soil burial and sea water ageing of low-density polyethylene: Effect of starch/linear low-density polyethylene masterbatch By M. Elanmugilan, P. A. Sreekumar, N. K. Singha, M. A. Al-Harhi, S. K. De *J. Appl. Polym. Sci.*, 129(1), 449-457 (2013)
21. Novel thermoplastic vulcanizates (tpvs) based on silicone rubber and polyamide exploring peroxide cross-linking By T. Chatterjee, S. Weissner, G. Heinrich and K. Naskar\* *Express Polymer Letters* 8, 220 (2014)
22. Phase behaviour and separation kinetics of polymer blends By N.C. Das *Journal of Microscopy* 253, 198 (2014)
23. Phases of superfluid helium in smooth pore By T.R. Prisk, N.C. Das, S.O. Diallo, N. Wada, S. Inagaki, P.E. Sokol *Physical Review B* 88, 014521 (2013)
24. Poly(meth)acrylate Grafted EPDM via Reverse Atom Transfer Radical Polymerization: A Single Pot Process By D. J. Haloi, K. Naskar and N. K. Singha *European Polymer Journal* 49, 4098 (2013)
25. Polyaniline, ethylene vinyl acetate semi-conductive composites as pressure sensitive sensor By M Rahaman, TK Chaki, D Khastgir *Journal of Applied Polymer Science* 128(1) 161-16 (2013)
26. Preferential distribution of polyaniline in different phases of acrylate triblock copolymer By Subhendu Bhandari, Nikhil K. Singha, and Dipak Khastgir *Material Express* 4, (2), 115-124 (2014)
27. Preparation of Poly (2-Hydroxyethyl Methacrylate) Microspheres bearing Metronidazole, an Antiprotozoal Drug By Debasish Mondal, S. K. Ghosh and N. K. Singha *Advanced Science, Engineering and Medicine*. 6, 1-5 (2014)
28. Proton exchange properties of flexible diamine-based new fluorinated sulfonated polyimides By Preetom Sarkar, Aruna Kumar Mohanty, Parthasarathi Bandyopadhyay, Santanu Chattopadhyay and Susanta Banerjee *RSC Advance* 4, 11848-11858 (2014)
29. Reversible addition fragmentation chain transfer (RAFT) polymerization of 2,2,3,3,4,4,4 hepta fluoroacrylate (HFBA) By B. P. Koiry, M. Moukwa, N. K. Singha *Journal of Fluorine Chemistry* 153, 137-142 (2013)
30. Role of calcium stearate as a dispersion promoter for new generation carbon black-organoclay based rubber nanocomposites for tyre application By Tapas R Mohanty, Vivek Bhandari, Arup K. Chandra, Pijush K. Chattopadhyay and Santanu Chattopadhyay *Polymer Composites* 34 (214-224) (2013)
31. Stearate modified zinc- aluminum layered double hydroxides and acrylonitrile butadiene rubber nanocomposites By S. B. Eshwaran, D. Basu, B. Kutlu, A. Leuteritz, U. Wagenknecht, K. W. Stockelhuber, K. Naskar, A. Das and G. Heinrich *Polymer-plastics Technology and Engineering* 52, 65 (2014)

32. Structurally different Short Aramid Fiber Reinforced Thermoplastic Polyurethane By G. S. Shibulal and K. Naskar\* *Polymer Composites* DOI 10.1002/pc.22830 (2013)
33. Synthesis and Characterization of Elastomeric Polyurethane (PU) and PU/clay Nanocomposites based on an Aliphatic diisocyanate By C. Saha, Tapan Chaki, Nikhil K. Singha *Journal of Applied Polymer Science* 130, (5) 3328-3334 (2013)
34. Synthesis and Characterization of novel polycarbonate based polyurethane/polymer wrapped hydroxyapatite nanocomposites: mechanical properties, osteoconductivity and biocompatibility By M.Selvakumar, Saravana Kumar Jaganathan, Golok B. Nando and Santanu Chattopadhyay *Journal of Biomedical Nanotechnology* Accepted (2014)
35. Synthesis and Characterization of Poly(2-ethyl hexyl acrylate) via ATRP, RATRP and FRP By D.J. Haloi, B. P. Koiry, P. Mandal and N. K. Singha *Journal of Chemical Sciences* 125(4), 791–797 (2013)
36. Synthesis of Novel Four Armed PE-PCL Grafted Superparamagnetic and Biocompatible Nanoparticles By Sudipta Panja, Biswajit Saha, S. K. Ghosh and Santanu Chattopadhyay *Langmuir* 29, 12530–12540 (2013)
37. Tailor-made polyfluoroacrylate and its block copolymer by RAFT polymerization in miniemulsion improved hydrophobicity in the core–shell block copolymer By Chakrabarty, Arindam Singha, Nikhil K *Journal of Colloid and Interface Science* 408, 66–74 (2013)
38. Tailor-made polymethacrylate bearing bicyclo-alkenyl functionality via selective ATRP at ambient temperature and its post-polymerization modification by ‘thiol-ene’ reaction By Mandal P. and Singha, N. K. *RSC Advances* 4(11) 5293-5299 (2014)
39. The heat–chill method for preparation of self-assembled amphiphilic poly( $\epsilon$ -caprolactone)–poly(ethylene glycol) block copolymer based micellar nanoparticles for drug delivery By Sanal Payyappilly, Santanu Dhara and Santanu Chattopadhyay *Soft Matter* 10, 2150-2159 (2014)
40. Thermal stability and fire retardancy of polyurea and epoxy nanocomposites using organically modified magadiite By Thirumal Mariappan, Deqi Yi, Arindam Chakraborty, Nikhil K Singha and Charles A Wilkie *Journal of Fire Sciences* DOI: 10.1177/0734904 (2013)
41. Thermally amendable tailor-made polymer by RAFT polymerization and click reaction By N. Pramanik, D. S. Bag, S. Alam, G. B. Nando, N. K. Singha *Journal of Polymer Science Part A Polymer Chemistry* 51, 3365–3374 (2013)
42. Thermally Stable Electromagnetic Interference Shielding Material from Polysulfone Nanocomposites: Comparison on Carbon Nanotube and Nanofiber Reinforcement By L. Nayak, D. Khastgir, R. R. Pradhan, and T. K. Chaki, *Polymer Composite* DOI 10.1002/pc.22973 (2014)
43. Thermoresponsive biodegradable PEG-PCL-PEG based injectable hydrogel for pulsatile insulin delivery By Sanal Payyappilly, Santanu Dhara and Santanu Chattopadhyay *Journal of Biomedical Materials Research Part A* 102, 1500-1509 (2014)

### ***Papers Presented in Conferences***

1. Novel Thermoplastic Elastomeric Nanocomposites, By T K Chaki and J S Borah, *International Conference on Nanotechnology, ICNT-2013*, Haldia Institute of Technology, Haldia, (2013)
2. Ablative polyimide based EPDM nanocomposites, By Sangita Singh, P.K.Guchhait, T.K.Chaki, *International Conference and Expo on Recent Advances in Polymer and Rubber Science & Technology (RAPT-2014)*, University of Calcutta, Kolkata, India., (2014)
3. Antistatic Materials from In-Situ Polymerized Polyimide Composites Filled with Air Oxidized Carbon Nanofibers and Carbon Nanotubes, By L. Nayak, D. Khastgir, R. R. Pradhan, and T. K. Chaki, *International Conference on Advancements in Polymeric Materials (APM-2014)*, Bhubaneswar, (2014)
4. Biodegradable injectable hydrogel for drug delivery, By Sanal Payyappilly, Santanu Dhara and Santanu Chattopadhyay, *7th International Conference on materials for advanced technologies (ICMAT-2013)*, Suntec, Singapore, (2013)

5. Characterisation and Applications of Compatible and Incompatible Polymer Blends, By Dipak Khastgir, *International Conference on Nanotechnology (ICNT-2013)*, Haldia Regional Centre, Indian Institute, (2013)
6. Development of High Temperature Insulation Compound based on EPDM/Polyimide/Carbon Nanofiber Composite, By Sangita Singh, P K Guchhait, N K Singha, T K Chaki, *International Elastomer Conference, Rubber Division, American Chemical Society (ACS)*, Cleveland, Ohio, USA, (2013)
7. Development of Radiation Absorbing Materials from Polysulfone – Carbon Nanofiber Nanocomposites, By L. Nayak, D. Khastgir, R. R. Pradhan, and T. K. Chaki,, *National Seminar on Innovations in Science and Technology for Inclusive Development, Indian Science Congress*, Bhubaneswar, (2013)
8. Electrical and electromagnetic interference shielding properties of carbon nanotube and poly(methyl methacrylate) composites, By Das, NC, Sokol, PE, Nayak, L, Chaki, TK, *246th National Meeting of the American-Chemical-Society (ACS)*, Indianapolis, IN, (2013)
9. Electrically Conducting Polyaniline Nanorod for Capacitor Application, By Subhendu Bhandari, Nikhil K. Singha, Dipak Khastgir, *International Conference on Functional Materials (ICFM)*, IIT Kharagpur, (2014)
10. Estimation of Friction Circle for Assessment of Tyre Sliding behavior through FEA, By G Prasad, T K Chaki and G Unnikrishnan, *International Conference on Mechanical & Production Engineering (ICMPE)*, Pune, (2014)
11. Grafting of poly(meth)acrylate on Polyolefinic Elastomers via Controlled Radical Polymerization, By D. J. Haloi, K. Naskar, N.K. Singha, *International Elastomer Conference Rubber Division 184th Technical Meeting*, Cleveland, USA, (2013)
12. Graphene-iron oxide nanocomposite: An efficient catalyst for ammonium perchlorate(AP) decomposition reaction, By Abhijit Dey, Javaid athar, Arun Kanti Sikder, Mrinal Ghosh, Suman Jiwan Pawar, Anurag Tripathi, Hima prasanth, Santanu Chattopadhyay, *International Conference on Functional Materials (ICFM-2014)*, Materials Science Centre, IIT, Kharagpur, (2014)
13. Piezoelectric, Dielectric & Mechanical Behaviour of Polyurethane-Titania Nanocomposites, By D.Khastgir, T.K. Chaki, & S. Nayak, *An International Conference & Expo on Recent Advances in Polymer & Rubber Science and Technology(RAPT-2014)*, University of Calcutta, Kolkata, (2014)
14. Polyurethane-Titania Nanocomposites as Pressure Sensitive Dielectric Elastomer, By Suryakanta Nayak, T. K. Chaki, D. Khastgir, *International Conference on Nanotechnology, Nanomaterials and Thin Films for Energy Applications (Nano Energy 2014)*, University College London, UK, (2014)
15. Pros and Cons of Development of Thermoplastic Vulcanizate (TPV) via Various Routes, By K. Naskar, *FAPS-MACRO 2013*, Bangalore, (2013)
16. Radical induced dynamic vulcanization of PA12/PDMS Blends, By S. Wiessner, T. Chatterjee and K. Naskar, *PPS-29*, Nuremberg, Germany, (2013)
17. Self assembled block copolymer nanoparticles for drug delivery, By Sanal Payyappilly, Santanu Dhara and Santanu Chattopadhyay, *International Conference on rubber and rubber-like materials (ICRRM 2013)*, RTC, IIT Kharagpur, (2013)
18. Self assembled PEG-PCL-PEG for Insulin delivery, By Sanal Payyappilly, Santanu Dhara and Santanu Chattopadhyay, *FAPS-MACRO-2013*, IISc, Bangalore, (2013)
19. Strategies to develop excellent TPVs, By K. Naskar, *RAPT 2014*, Kolkata, (2014)
20. Super Heat Resistant Conductive Nanocomposites based on Polysulphone-Carbon Nanofillers, By D.Khastgir, T.K. Chaki,L. Nayak, *4th International Conference on Innovation in Polymer Science & Technology(IPST 2013)*, Yogyakarta, Indonesia, (2013)
21. Synthesis and characterization of armed PE-PCL grafted superparamagnetic nanoparticles, By Sudipta Panja and Santanu Chattopadhyay, *International Conference on rubber and rubber-like materials (ICRRM 2013)*, RTC, IIT Kharagpur, (2013)
22. Synthesis of functional polymethacrylate via selective ATRP and Thiol-ene Reaction therein, By Prithwiraj Mandal, Nikhil K. Singha, *International Conference on Functional Materials (ICFM)*, IIT Kharagpur, (2014)

23. Thermoplastic Vulcanizates (TPVs): Controlling the Mechanical Property-processing Balance via the Rubber Particle Size from Micro to Nano, *By* K. Naskar, U. Gohs and G.Heinrich, *ICMAT 2013 Conference*, Suntec, Singapore, (2013)
24. Thermoreversible Block Copolymer/clay Nanocomposite via surface Initiated (SI-ATRP) and Click Reactor in Clay Surface., *By* Nabendu B. Pramanik, Dhruba J. Haloi and Nikhil K. Singha, *International Conference on Functional Materials (ICFM)*, IIT Kharagpur, (2014)

## Rural Development Centre

### **Head**

Prof. P B Singh Bhadoria

### **Associate Professors**

Bhowmick, Pradip Kumar *Ph.D., D.Litt.*, Tribal & Rural Development Planning

Lahiri, Debabrata *Ph.D.(BHU, Varanasi)*, Economics of Renewable Energy Economics of Microfinance Monitoring & Evaluation Technology Transfer

Mahapatra, Subhash Chandra *Ph.D.(IIT Kharagpur)*, Crop Production and Development Transfer & Management of Rural Technology

### **Brief Description of on-going activities**

A. Teaching : two courses viz. RD30002 and RD30004 at undergraduate level as professional breadth  
B. Research and Development: 1. Essential oil production technology; 2. Fish feed production from non-conventional biological sources; 3. Farm level technology for processing of agricultural products.  
C. Extension: 1. Transfer of agricultural products processing technology; 2. Organization of training and workshops on rural technology application

### **Thrust Areas**

1. Development and Transfer of Technology, Resource Planning and Marketing, Tribal Development

### **Lectures by Visiting Experts**

1. Energy, Ecology and Rural Development by Professor Y P Singh (Distinguished former Professor and Alumnus of IIT Kharagpur)

### **Member - Professional Bodies**

1. Mahapatra, Subhash Chandra, *Life Member* - Indian Society for Tuber Crops
2. Mahapatra, Subhash Chandra, *Life Member* - Mushroom Society of India (MSI)
3. Mahapatra, Subhash Chandra, *Life Member* - Weed Science Society, West Bengal
4. Mahapatra, Subhash Chandra, *Life Member* - Association of Food Scientists and Technologists (India)
5. Mahapatra, Subhash Chandra, *Life Member* - Eastern India Horticulture and Biotechnology Centre
6. Mahapatra, Subhash Chandra, *Life Member* - Indian Mushroom Growers Association
7. Mahapatra, Subhash Chandra, *Life Member* - Indian Society of Agricultural Science
8. Lahiri, Debabrata, *Regular* - American Agricultural Economics Association
9. Lahiri, Debabrata, *Regular* - International Institute of Fisheries Economics and Trade (IIFET)
10. Lahiri, Debabrata, *Life Member* - Indian Society of Agricultural Marketing
11. Lahiri, Debabrata, *Annual* - Indian Society of Agricultural Economics
12. Lahiri, Debabrata, *Life Member* - Agricultural Economics Research Association
13. Lahiri, Debabrata, *Life Member* - Indian Academy of Social Sciences
14. Bhowmick, Pradip Kumar, *Regular* - The Institute of Social Research and Applied Anthropology
15. Bhowmick, Pradip Kumar, *Regular* - Indian Political Economic Association

### ***Member - Editorial Board***

1. Bhowmick, Pradip Kumar (2010) *Editor - Man and Life*
2. Bhowmick, Pradip Kumar (2009) *Editorial Board Member - Indian Journal of Millennium Development Studies*
3. Lahiri, Debabrata (2006) *Member Editorial Board - Indian Journal of Agricultural Marketing*

### ***Sponsored Research Projects***

1. Demonstration of Technologies for Green House Production of Roses and Extraction of Rose Oil (Department of Science & Technology, New Delhi, Rs.17.60 Lakhs)
2. Innovative use of undulating drought prone fragile lateritic wastelands in the remote tribal belt recourse to larger scale production of a kharif mino (Department of Science & Technology, SEED Division, Technology Bhavan, New Mehrauli Road, New Delhi - , Rs.15.15 Lakhs)
3. Innovative use of undulating lands...Niger crop...(IUU) (DST, SEED Division (Tribal Sub Plan), Rs.15.15 Lakhs)
4. Res. & Dev. and Dissemination of Human Energy or Minimal Energy Driven Composit Devices for Farm Level Processing of Agricultural Products: 2nd phase (Directorate of Agricultural Marketing, Govt. of West Bengal under the RKVY Scheme of GoI, Rs.25.00 Lakhs)
5. Research & Development and Dissemination of Appropriate Technology for Small Scale Grain Storage for Value Addition, Improving Marketability and Incom (Department of Agriculture MW & C Branch Government of West Bengal Marketing, Rs.40.00 Lakhs)

### ***Technology Transferred***

1. Farmers of various districts in West Bengal - Grinder for spices and other grains : Rs. 22.00 Lakh
2. Farmers of various districts in West Bengal - Mini Pulse Mill : Rs. 18.00 Lakh
3. Farmers of various districts in West Bengal - Vegetable Seed-Oil Extractor : Rs. 23.00 Lakh

### ***Patents (filed / granted)***

1. A Composite Technology of Turmeric (*C. longa*) Processing Including Polishing, Grinding and Extraction of Turmeric Oil and Curcumin at Rural Level
2. Low cost extractor for Turmeric oil and curcumin

### ***Invited Lectures by Faculty Members***

1. RURAL DEVELOPMENT POLICIES, APPROACHES AND STRATEGIES by Bhowmick, Pradip Kumar (THE INSTITUTE OF SOCIAL RESEARCH AND APPLIED ANTHROPOLOGY)

### ***Papers Presented in Conferences***

1. Effect of biosources, potential plant nutrient on crop productivity of Niger (*Guizitia abyssinica* Cass.), By Monaswita Talukdar, Subhradeep Samadder, S C Mahapatra, P B S Bhadoria, *International Conference on Biodiversity, Bioresources and Biotechnology*, Mysore, Karnataka, (2014)



## **G S Sanyal School of Telecommunication**

### ***Head***

Prof. Saswat Chakrabarti

### ***Professor***

Chakrabarti, Saswat                      *Ph.D.(IIT Kharagpur)*, Digital Communications, Wireless Communications, Bio-telemetry

### ***Assistant Professors***

Das, Goutam                                *Ph.D.(Univ. of Melbourn)*,

Das, Suvra Sekhar                      *Ph.D.(Aalborg Univ., Denmark)*, Broadband Mobile Communications, Physical & MAC Layer, 4G, OFDM, MIMO, Packet Scheduling, Link Adaptation, Femto Cells

Ray, Priyadip                              *Ph.D. (Syracuse Univ.,New York)* ,  
<http://pray.mysite.syr.edu/>, Detection and estimation theory wireless communication wireless sensor networks cognitive radio

Sen, Debarati                              *Ph.D.(IIT Kharagpur)*, Wireless Communication, 4G and Beyond, PHY and MAC Layer, Short Range Communication, Green Communication, Coherent Optical Communication

### ***Faculty Appointments***

Debarati Sen                                Assistant Professor

Nicola Marchetti                         Visiting Assistant Professor

### ***New Academic Programmes***

Proposed a new MTech program on "Wireless Communications and Networks".

### ***Brief Description of on-going activities***

First phase of VICET activities successfully completed in late 2013 resulting in 11 patents and more than 39 technical publications. The activity has now been extended for another 3 years.

Taking all steps to ensure the introduction of a specialized MTech program in the areas of wireless communications and networks. Seven new subjects have already been launched towards this goal.

Have embarked on an ambitious program of creating a futuristic wireless test-bed with support from IIT Khargpur (SGDRI program - Rs. 2.5 crores), MICT. Govt. of India and multiple industry partners with a total projected budget of Rs. 24 crores.

### ***Thrust Areas***

1. Wireless communications and networking
2. Optical communications and networking
3. Statistical signal processing

### ***New Acquisitions***

1. FPGA test/ Programming facility with data acquisition cards
2. Radio Transceivers with FPGA test/ Programming facility
3. Embedded DSP Board with data acquisition

### ***International Collaborations***

Dr. Nicola Marchetti of Trinity College, Dublin will be visiting GSSST as a visiting assistant Professor during summer, 2014.

Dr. D. Sen is visiting Technical University of Munich, Germany through DAAD Faculty Exchange Scheme.

### ***Lectures by Visiting Experts***

1. MEMS Sensor Augmentation for Vehicular & Pedestrian Navigation *by* Jai Ganesh Balakrishnan (Texas Instruments, Bangalore)
2. *by* Partha P. Pande ( Washington State University, Pullman)
3. Wi-Fi based Positioning and Augmentation in Outdoor & Indoor Environments *by* Sthanunathan Ramakrishnan (Texas Instruments, Bangalore)
4. *by* Aditya Vempaty (Syracuse University, New York)

### ***Doctoral and MS Degrees Awarded***

1. Sanjeet Kumar : Channel coding and energy efficiency in low complexity distributed image and video coding(Ph.D)
2. Pankaj Kumar Gupta : Energy Assessment, Modelling and Energy Saving During Signaling Activities in Mobile Networks(MS)

### ***Member - Professional Bodies***

1. Das, Suvra Sekhar, *Member* - IEEE
2. Ray, Priyadip, *Member* - IEEE
3. Sen, Debarati, *Member* - IEEE
4. Sen, Debarati, *Member* - IEEE ComSoc, IEEE RCC, IEEE WIE, IEEE TCCC
5. Sen, Debarati, *Associate Member* - IEI
6. Chakrabarti, Saswat, *Member* - IEEE

### ***Member - Editorial Board***

1. Sen, Debarati (2008) *Editorial Board Member* - International Journal of Ultra Wideband Communications and Systems (IJUWBCS), Inderscience Publisher

### ***Awards & Honours***

1. Sen, Debarati (2014) *DAAD-IIT Faculty Exchange Fellowship*
2. Sen, Debarati (2013) *IETE N V Gadadhar Memorial Award*

### ***Sponsored Research Projects***

1. An Integrated framework for radio resource sensing and opportunistic communication in collaborative cognitive radio network (Recommended by WG) (DeitY, Rs.96.98 Lakhs)

2. Bayesian Multi-user detection in on-off random access channels (IIT Kgp, Rs.5.00 Lakhs)
3. Design and Simulation of Baseband Digital CDMA Transceiver (ITR, DRDO, Rs.9.50 Lakhs)
4. Development of Interference Mitigation methods through Base Station Cooperation in Next Generation Wireless Broadband Mobile Communications Networks (DIT, Rs.90.60 Lakhs)
5. Energy Efficient Radio for Next Generation Cellular (Vodafone, Rs.185.00 Lakhs)
6. Facility for Design, Development and Testing of Next Generation Telecom Gears (IIT kgp, Rs.250.00 Lakhs)
7. Self Configuring Networks: Flexible Spectrum Sharing for Home Base Station in Next Generation Mobile Telecommunication Systems (Vodafone, Rs.19.00 Lakhs)
8. STANDARDIZATION ACTIVITY IN 4G & BEYOND IN RAN. (Vodafone, Rs.32.75 Lakhs)
9. Studies on FadeMitigation Control for Microwave Satellite Signal Propagation (ISRO, Rs.10.00 Lakhs)
10. VICET (Vodafone India, Rs.452.00 Lakhs)
11. Virtual Laboratory Fading Channel & Mobile Communications, <http://203.110.240.139/> (MHRD, Rs.53.00 Lakhs)

***Patents (filed / granted)***

1. A Method for Ensuring High Volp Capacity in LTE
2. A method to obtain high data rate and contiued service over multiple radio access networks
3. A novel multirate orthogonal frequency division multiplexing system proposal to reduce intercarrier interference
4. Enhancing spectral efficiency of OFDM systems by Data Transmission over Pilot Tones
5. Method and Apparatus for Generating Multiple Sets of Codes for Spread Spectrum based Communication Systems
6. Method and System for Handling Interference Between a Low Power Network and a High Power Network
7. Method and System for Identifying an Emergency Signal of an Electronic Device by a Coordinator Device
8. Method and System of Frequency Synchronization for Sub-Band Multicarrier based Wideband Systems
9. Method and System of Timing Synchronization at Sub-sampled rate for Sub-sampled Wideband systems
10. Methods and Devices for Handling Inter-Symbol Interference in a Sub-band Ultra-Wideband Communication Environment
11. Scalable Sub-Band Ultra-wideband Communication System
12. System and Method for Sub-sampled OFDM based Sub-band Wideband for Energy Efficient UWB and 60GHz Communications
13. Timing Synchronization Method and Apparatus in a Wireless Communication System

***Books Published***

1. Ramjee Prasad, Muhammad Imadur Rahman, Suvra Sekhar Das, Nicola Marchetti: Single- and Multi-Carrier MIMO Transmission for Broadband Wireless Systems *published by* River Publishers (2009)
2. Ramjee Prasad, Suvra Sekhar Das, Muhammad Imadur Rahman: Adaptive PHY-MAC Design for Broadband Wireless Systems *published by* River Publishers (2010)

***Papers Published in Journals***

1. Area Spectral Efficiency of Co-Channel Deployed OFDMA Femtocell Networks *By* Prabhu Chandhar, Suvra Sekhar Das *IEEE Transactions on Wireless Communications* accepted (2014)

2. Bandwidth Partitioning and SINR Threshold Analysis of Fractional Frequency Reuse in OFDMA Cellular Networks for Real Time and Best Effort Traffic By Subba Rao Boddu, Atri Mukhopadhyay, Bigi Vargheese Philip, Suvra Sekhar Das & Ratnam V. Rajakumar *Wireless Personal Communications* 72, September(II) (2013)
3. Bayesian Joint Analysis of Heterogeneous Genomics Data By P.Ray, L. Zheng, J. Lucas and L. Carin *Bioinformatics* (2014)
4. Co-operative routing for wireless sensor networks using network coding By R.R. Rout, S.K. Ghosh, S. Chakrabarti *IET Wireless Sensor Systems* Vol.2,no.2,pp.75-85 (2012)
5. Energy Efficient Scalable Sub-band based Ultra-Wideband System By J. P. Nair, Debarati Sen, S. Jos, *Springer Wireless Pers. Comm.* 73(3), 1143-1167 (2013)
6. Equal Energy Dissipation in Wireless Image Sensor Network: A Solution to Energy-Hole Problem By A. Hossain, S. Chakrabarti, P.K. Biswas *Computers and Electrical Engineering* (2013)
7. False Discovery Rate Based Distributed Detection in the presence of Byzantines By A. Vempaty, P.Ray and P. K. Varshney *IEEE Transactions on Aerospace and Electronics Systems (accepted)* (2013)
8. MCRB for Timing and Phase Offset for Low-Rate Optical Communication with Self-Phase Modulation By Debarati Sen, H. Wymeersch, N. V. Irukulapati, E. Agrell, P. Johansson, M. Karlsson, P. A. Andrekson, *IEEE Comm. Letters* 17(5),1004-1007 (2013)

#### ***Papers Presented in Conferences***

1. Analysis of Area Spectral Efficiency for Co-Channel Deployed Macrocell-Femtocell OFDMA Networks, By Prabhu Chandhar, Suvra Sekhar Das, *IEEE International Conference on Communications (ICC 2013)*, Budapest, Hungary, (2013)
2. Analysis of Fractional Frequency Reuse in OFDMA Networks for Real Time and Best Effort Traffic, By Subba Rao Boddu, Atri Mukhopadhyay, Prabhu Chandhar, Bigi Vargheese Philip, Suvra Sekhar Das, *IEEE International Conference on Communications (ICC 2013)*, Budapest, Hungary, (2013)
3. Analytical Evaluation of Offloading Gain in Macrocell-Femtocell OFDMA Networks, By Prabhu Chandhar, Suvra Sekhar Das, *2013 IEEE 77th Vehicular Technology Conference: VTC2013-Spring*, Dresden, (2013)
4. Bandwidth Partitioning and SINR Threshold Design Analysis of Fractional Frequency Reuse, By Subba Rao Boddu, Atri Mukhopadhyay, Bigi Vargheese Philip, Suvra Sekhar Das, *National Conference on Communications 2013, (NCC13)*, IIT Delhi, (2013)
5. Call Admission Control for Real-Time Traffic in OFDMA Based Cellular Networks, By Subhendu Batabyal, Suvra Sekhar Das, *National Conference on Communications 2013, (NCC13)*, IIT Delhi, (2013)
6. Energy Saving in OFDMA Networks through Base Station Sleep Mode using Genetic Algorithm, By Suvra Sekhar Das, Prachi Agrawal, Prabhu Chandhar, *2013 IEEE 77th Vehicular Technology Conference: VTC2013-Spring*, Dresden, (2013)
7. Factor Graph based Cooperative Spectrum Sensing in Cognitive Radio over Time varying Channels, By D. Bera, I. Chakrabarti, P. Ray and S.S. Pathak, *IEEE VTC (Spring)*, Dresden, Germany, (2013)
8. Performance of VoIP in Presence of MIMO Interference in OFDMA (LTE) Networks, By Priyabrata Parida, Suvra Sekhar Das, Subhajit Paul, *2013 IEEE 77th Vehicular Technology Conference: VTC2013-Spring*, Dresden, (2013)

## **Rajendra Mishra School of Engineering Entrepreneurship**

### ***Head***

Prof. Partha Pratim Das

### ***Assistant Professors***

Bhattacharjee, Titas	<i>Fellow of IIM Calcutta</i> , Entrepreneurial Finance, Corporate Governance
Bhowmick, Bhaskar	<i>FPM (IIM, Ahmedabad)</i> , Leadership and succession Strategies, Business Environment and Identifying Measures
Chakraborty, Basab	<i>Ph.D.(IIT Madras)</i> , Nano Technology & New Material, Medical Devices & Imaging, Energy Management & Entrepreneurship
Prabha Bhola	<i>Ph.D.(IIT Kharagpur)</i> , Quality Management and Performance Measurement of Entrepreneurial Firms, Modelling SMEs Growth and its Impact for Sustainable Development, New Venture Creation
Roy, Ram Babu	<i>Fellow, IIM Calcutta (Ph D)</i> , Big Data and Business Analytics, Healthcare Operations Management, Health Service Delivery Models, Complex Networks

### ***New Academic Programmes***

RMSoEE was founded at Indian Institute of Technology (IIT) Kharagpur in the year 2010 aims to shape entrepreneurial minds of the engineering students. The School imparts strong entrepreneurial culture and develops skills in venture creation for early and late start-ups. The school offers a 5 year integrated dual degree with M. Tech in Engineering Entrepreneurship and B. Tech in an Engineering discipline.

### ***Brief Description of on-going activities***

1. Entrepreneurial outreach: RMSOEE being a department of entrepreneurship works in tandem with the aim of providing facilities to the entrepreneurs, with the help of STEP/TBI, TIETS and E-Cell, the different supporting agencies and numerous programs organized at IIT-Kharagpur.

-STEP-TIETS-TBI works as a conduit between IIT KGP and external world to facilitate technology transfer and convert research outcomes of entrepreneurs to commercially viable propositions. This year TIETS and TBI funded 7 start up companies of amount Rupees 96 Lakh.

-The school provides the entrepreneurship training to faculties and students of other engineering schools. This year school conducted 2 FDP and 4 TEDP programs updating 30 faculties and 51 students.

2. Global Entrepreneurship Summit: It is the largest student-level entrepreneurial summit in India. The latest GES 2014 was scheduled at IIT Kharagpur from 10th-12th January, 2014.

-1400 students from all over India participated.

-Programs included:

Start-up Camp,

Connect the Dots,

Elevator pitch,

Panel Discussion,

Innovation Exhibition,

Founder's Meet

3. International Summer and Winter Term on Big Data Analytics: RMSoEE is offering a course in

'Big data analytics' in the first International Summer and Winter Term(ISWT) started by Indian Institute of Technology Kharagpur in collaboration with reputed national and international faculty.

4. RS Day: Rajendra Mishra School of Engineering Entrepreneurship, IIT Kharagpur has celebrated its first Research Scholars' Day "Insight 2014" on March 23, 2014 at Kalidas Auditorium, IIT Kharagpur.

-The occasion was graced by the esteemed presence of Mr. Arindam Mukherjee, Chief Executive Officer, Alumnus Software Ltd. as the Chief Guest. Prof. Rajendra Singh, Dean(UGS), who was the officiating Dean(PGS&R), IIT Kharagpur presided over the function.

-The students presented their research through posters which evoked a lot of interest.

-The day closed with a panel discussion on University startup is an anti-cultural dream in India.

### ***Thrust Areas***

1. RMSoEE has identified four thrust areas of research and project implementations based on the strength and skill sets of faculties in the department;
  - A. Business Analytics
  - B. Health care Service delivery
  - C. Energy Management and Entrepreneurship
  - D. Start up Environment and ecosystem Analysis

The school is committed to design new courses in regular offerings and in Summer-Winter term schools in supporting to build up these areas. Faculties are also writing projects for in-house, national level and international level funding to strengthen the application areas. The academic team is designing teaching labs, research labs, and application labs to support the research and teaching activities in these identified and related fields.

### ***New Acquisitions***

1. A. *Innovation Lab*: I-lab is where innovations are born. Innovation Lab at RMSoEE, aims to produce entrepreneurially oriented competent individuals. Each student of RMSoEE is attached with innovation laboratory during their IIT learning journey. The lab provides
  1. Added the facility of web conferencing
  2. Added the facility of high performing printing for students
  3. Computing facility made for 24\*7 hrs
  4. Networking with alumni and industrial associations broaden.

B. *Analytics Lab*: The analytics lab at RMSoEE is envisioned to provide hands-on training to the students and innovators on application of various analytical tools and techniques for business intelligence and business decision making. The lab would house necessary hardware platform and software tools for big-data analytics in health care and entrepreneurial ventures:

1. Added Monte Carlo simulation software.
2. Two work stations added with 2X Intel Xenon processor.
3. Faculty computers are added with Intel Core i5-4500 series processors.
4. Heavy duty scanner and printer added to faculty facilities.

C. *Modeling lab*: Lab will provide with access to high-end technologies revolving around computer modelling and visualization of multi-dimensional environments as they apply to nearly any discipline. A multitude of hardware and software technologies are combined in the 3D Lab, including Virtual Reality, Scientific Visualization, Imaging Technology, 3D Modeling and Animation, Computer Graphics, Rapid Prototyping:

1. Experts on modelling through software are on collaboration.
2. Multi color, multi material, multi nozzle 3D printer with 100 micron accuracy bought in the lab.
3. Sourcing for input materials required for 3D modelling are done.

### ***International Collaborations***

1. Prof. I J Chiang, Taipei Medical University, Taiwan for a course in Big Data Analytic.
2. Prof. Paul Lillrank, Aalto University for research on healthcare management.
3. Dr. Ajit Kumar, Postdoctoral Fellow, Graduate Institute of Cognitive Neuroscience, National Central University, Taiwan for research in healthcare domain.
4. Prof Sanjay Mishra, University of Kansas, USA for research on Entrepreneurship and Innovation.

### ***Lectures by Visiting Experts***

1. Entrepreneurship and its challenges. *by* Mr. Arindam Mukherjee (CEO, Alumnus Software)
2. Social Entrepreneurship *by* Anjan Ghosh (Director, SINI)
3. Improving Productivity and Benchmarking *by* Dr. Palus Tokki (University of Alto, Finland)
4. The right time for Venture Capital *by* Dr. Saibal Roy (Founder, ARW)
5. Entrepreneurship *by* Arjun Sen (President and Board Member at PanIIT Alumni India. Founder, ZENMANGO)
6. Innovations in Health Care Services *by* Dr. Paul Lillrank (University of Alto, Finland)
7. Innovations at KVK: Case of Seva Bharati *by* Dr. Ranjan Kumar Sen (Seva Bharati)

### ***Member - Professional Bodies***

1. Roy, Ram Babu, *Associate Member* - The Institution of Electronics and Telecommunication Engineers (IETE)

### ***Member - Editorial Board***

1. Roy, Ram Babu (2014) *Reviewer* - European Journal of Operations Research

### ***Sponsored Research Projects***

1. Faculty Development Programme (FDP) (Dept.of Science and Technology, Govt. of India, Rs.175000.00 Lakhs)
2. SUPPORT OF ENTREPRENEURIAL AND MANAGEMENT DEVELOPMENT OF SMES THROUGH INCUBATORS (SEI) (Ministry of MSME, Govt. of India, Rs.17.29 Lakhs)
3. SUPPORT TO TEPP OUTREACH CUM CLUSTER INNOVATION CENTRE (TOCIC) AT INDIAN INSTITUTE OF KHARAGPUR UNDER PROMOTING INNOVATIONS IN INDIVIDUALS, START-UPS (DSIR, NEW DELHI, Rs.12.00 Lakhs)
4. Technology based Entrepreneurship Development Programme (EDP) (Dept.of Science and Technology, Govt. of India, Rs.1200000.00 Lakhs)
5. TECHNOLOGY BUSINESS INCUBATOR (TBI) (Department of Science and Technology, Govt. of India, Rs.20.00 Lakhs)
6. Technology Incubation and Development of Entrepreneurs (TIDE) (Department of Information Technology, Govt of India., Rs.1.55 Lakhs)
7. Technology Refinement & Marketing Programme (TREMAM) (TIFAC, Department of Science & Technology, Government of India, Rs.40.00 Lakhs)
8. TEPP OUTREACH CENTRE (TPP) (Department of Science & Technology (DST), Government of India, Rs.6.00 Lakhs)

### ***Invited Lectures by Faculty Members***

1. Entrepreneurship *by* Bhowmick, Bhaskar (IMI Kolkata)
2. Entrepreneurship and New Ventures *by* Prabha Bholra (Bhubaneswar (EMBA, VGSOM))
3. Business valuation *by* Bhattacharjee, Titas (Institute of Chartered Accountants of India)

4. Entrepreneurial Finance in Faculty Development Programme by Bhattacharjee, Titas (STEP, IIT Kharagpur)
5. Entrepreneurship and Social Impact by Bhowmick, Bhaskar (STEP IIT Kharagpur)

***Short-Term Courses, Training Programmes and Workshops organised***

1. Big data analytics (Two weeks (to be offered in summer\*))

***Papers Published in Journals***

1. An approach to prioritize Quality Dimensions of IT enabled small service firms: A study of Indian SMEs By Rana Basu and Prabha Bhola *11th IEEE International Conference on Service Systems and Service Management (ICSSSM)* (2014)
2. Developing and Evaluating a New Scale for Product Positioning Uncertainty in India By Ghosh, S. & Bhowmick, B. *International Journal of Scientific and Engineering Research* Volume 5(1),552-559 (2014)
3. Disclosure, Foreign Institutional Investment and Volatility: A Study in Indian context By Titas Bhattacharjee and Suddhasanta De *Indian Journal of Finance* Vol 7(9) Pg 16-26 (2013)
4. Smart Healthcare Delivery System: An Innovation in Rural West Bengal By Ghosh, S. & Bhowmick, B. *Exploria, 2014 Conference*. ISSN 0976-8262 (2014)
5. Tata Sons Limited - 2010 By Dixit, M. R. & Bhowmick, B. *IIMA Cases* BP0356 (2013)

***Papers Presented in Conferences***

1. An approach to prioritize Quality Dimensions of IT enabled small service firms: A study of Indian SMEs, By Rana Basu and Prabha Bhola, *11th IEEE International Conference on Service Systems and Service Management (ICSSSM2014)*, Beijing, China, (2014)
2. Smart Healthcare Delivery System: An Innovation in Rural West Bengal, By Ghosh, S., & Bhowmick, B., *Exploria 2014*, MIT-SOM, Pune, (2014)



## **Rajiv Gandhi School of Intellectual Property Law**

### ***Head***

Prof. Khushal Vibhute

### ***Associate Professors***

Dube, Dipa *Ph.D.(Calcutta University), Crimes against Women*

Dube, Indrajit *Ph.D.(Calcutta University), Corporate Law & Governance, Environmental Governance, Competition Law*

M. Padmavati *Ph.D.(Central Univ. Hyderabad), Plant Metabolic Pathways Drug regulation Biodiversity Bioenergy IP and commercialisation*

Raju, K. D. *Ph.D.(JNU), International Law, Intellectual Property Law, International Trade Law*

### ***Assistant Professors***

Basu, Arindam *L.L.M.(NALSAR), Law and Economics, Social Ecology, Green Patent, Carbon Trading, Law of Contract*

Shankar, Uday *L.L.M.(Univ. of Delhi), Constitutional Law, Constitutional Law: Human Rights (Social and Economic Rights) Energy Law Labour and Industrial Law, Human Rights, Energy Law, Labour and Industrial Law*

Shreya, Matilal *LL.M.(Case Western), Secodary Copyright Infringement*

Shukla, Gaurav *L.L.M (D.A.V.V. Indore), Direct & Indirect Taxation, International Taxation, Civil Laws*

Subramanian *LLM (Germany), Ph.D.(Nagpur Univ.), International law, International Human Rights law, International Investment law*

### ***Faculty Appointments***

Mr. Gaurav Shukla Assistant Professor

### ***Brief Description of on-going activities***

TIFAC Eastern Region "Women Scientist Scholarship Scheme" Program

Research in Corporate Legal Affairs with special reference to Corporate Governance under the IICA

Riven Basin Management- Development of Law and Policy framework with special reference to Ganga.

Creation of Multimedia based Courseware for E&IT students to be implemented by IIT Kharagpur

Plant Metabolic Pathway Laboratory

Implementation of Feature in the Indian Patent Office Search Platform-IPATS

GI Registration and Post Registration Measures of Traditional Handloom Textiles from Orissa

Intellectual Property Education, Research and Public Outreach Program

Legal & Policy Framework in Renewable Energy Sector: A Study of Eastern India

Corporate Governance in Energy Sector in India

***Thrust Areas***

1. Intellectual Property Law
2. Corporate Laws
3. Environmental Laws
4. Criminal Law
5. Public Law
6. International Law
7. Energy Law

***Lectures by Visiting Experts***

1. The Development of Criminology *by* Prof. B.B. Pande (Ex- Prof. Delhi University)
2. Code of Criminal Procedure *by* Mr. Sujit Kumar Nandi (Professor, KIIT Law School and Ex-Faculty, State Judicial Academy)
3. Judicial Accountability *by* Prof. M.P.Singh (Vice Chancellor, NUJS)
4. Working of World Bank *by* Mr. Bajor Mehta (World Bank Senior Urban Specialist)
5. Legal Research Methodology *by* Prof. Ishwar Bhat (Vice Chancellor, NUJS Kolkata)

***Doctoral and MS Degrees Awarded***

1. Gaurav Choubey : Utility Patents in India(LL.B.)
2. Sriram Chakraborty : Corruption and Good Governance in India(LL.B.)
3. Umang Srivastava : Access to Justice in India(LL.B.)
4. Anand Singh : Corporate Crime(LL.B.)
5. Ankush Verma : Drug Pricing: Looking through the prism of Human Rights(LL.B.)
6. Prasenjit Mondal : Deconstruction in Law of Contract(LL.B.)
7. Jogeshwar K.P. Mishra : Performers Right- The Indian Understanding(LL.B.)
8. Sunil Phatak : Top Management Succession and Corporate Governance(LL.B.)
9. Rajeev Gupta : Joint venture and Competition in India(LL.B.)
10. Aparup Pakhira : Corporate Structure & Governance(Ph.D)
11. M.P. Ram Mohan : Transboundary Nuclear Liability Regime(Ph.D)
12. Abir Chattoraj : Corporate Governance and Economic Development at Crossroad:A Cross Jurisdictional Analysis(LL.B.)
13. Adhar Kashyap : decision Model to Prioritize and Select Urban Infrastructure Projects(M. Tech)
14. Bhagwan R. Gawali : Law and Process of Investigation by CBI in Administration of Criminal Justice- A Critical Analysis(Ph.D)

***Member - Professional Bodies***

1. M. Padmavati, *Life Member* - Biotech Research Society of India
2. M. Padmavati, *Member* - International Patent Information User Group
3. M. Padmavati, *Member* - Biotech Consortium India Limited
4. M. Padmavati, *Member* - Association of Teachers and Researchers in IP (ATRIP)
5. M. Padmavati, *Member* - World Bioenergy Association
6. M. Padmavati, *Member* - Scientific Committee Member , Food Safety Standards Authority India

7. M. Padmavati, *Member* - West Bengal Science and Technology Council
8. Dube, Indrajit, *Academic Member* - European Corporate Governance Institute, London
9. Dube, Indrajit, *Member* - Corporate Law Teachers Association, Sydney
10. Dube, Dipa, *Life* - Indian Society of Criminology
11. Dube, Dipa, *Regular* - International Society of Victimology
12. Raju, K. D., *Nominated* - IUCN CEL
13. Raju, K. D., - High Power Committee Appointed by the High Court of Calcutta on Wetlands
14. Raju, K. D., *Life Member* - Indian Society of International Law
15. Shankar, Uday, *Individual Member* - International Association of Constitutional Law
16. Shankar, Uday, *Individual Member* - Indian Society of International Law
17. Basu, Arindam, *Member* - International Environmental Association
18. Basu, Arindam, *Member* - Greenpeace India
19. Subramanian, *Associate Member* - Indian Society of International Law
20. Subramanian, *Member* - British Institute of International and Comparative Law
21. Subramanian, *Member* - Society for International Economic Law
22. Vibhute, Khushal, *Member* - Research Advisory Committee of the Research Unit for Socio-Legal Studies, University of Calgary, Alberta, Canada
23. Vibhute, Khushal, *Life Member* - Indian Law Institute, New Delhi
24. Vibhute, Khushal, *Member* - IUCN Academy of Environmental Law, Ottawa, Canada
25. Vibhute, Khushal, *Life Member* - Indian Society of International Law, New Delhi
26. Vibhute, Khushal, *Life Member* - Environmental Scientists' Association of India
27. Vibhute, Khushal, *Member* - International Jurists' Organization (Asia)
28. Vibhute, Khushal, *Member* - South Asian Society of Criminology and Victimology (SASCV)

#### ***Member - Editorial Board***

1. Dube, Dipa (2012) *Member* - Studies in Sociology of Science
2. Dube, Dipa (2012) *Member* - International Law and Policy Research Journal
3. Dube, Indrajit (2011) *Member* - Public Administration Research
4. Dube, Indrajit (2012) *Associate Editors* - Indian International Journal of Juridical Sciences
5. M. Padmavati (2010) *Editorial Member* - Biopharmaceuticals
6. Shankar, Uday (2012) *Editorial Panel* - International Journal of Contemporary Laws (ISSN No.2277 3649)
7. Shankar, Uday (2012) *Editorial Advisory Panel* - Chotanagpur Law Journal ( ISSN No. 0973 5858 )
8. Subramanian (2012) *Member, Board of Editors* - International Journal of Legal Studies and Research
9. Vibhute, Khushal (2002) *Member* - Asian Yearbook of International Law
10. Vibhute, Khushal (2004) *Member, Advisory Board* - International Journal of Criminal Justice Science
11. Vibhute, Khushal (2013) *Member, Advisory Board* - International Journal of Law and Policy
12. Vibhute, Khushal (2009) *Member, Advisory Board* - US-China Law Review

#### ***Sponsored Research Projects***

1. Bioactive peptide synthesis from honey protein and its characterisation (CSIR, Rs.18.42 Lakhs)
2. Corporate Governance in Energy Sector in India (National Foundation For Corporate Governance, New Delhi, Rs.4.00 Lakhs)
3. Creation of Multimedia based Courseware for E&IT students to be implemented by IIT Kharagpur (Dept. of Information Technology, Rs.115.00 Lakhs)
4. Ganga River Basin Management Plan - Policy, Law & Governance (Ministry of Environment, Rs.30.00 Lakhs)
5. IICA Hub (Ministry of Corporate Affair, Rs.40.00 Lakhs)

6. Intellectual Property Education, Research and Public Outreach (MHRD, New Delhi, Rs.76.00 Lakhs)
7. Legal and Policy Framework in Renewable Energy Sector: A Study of Eastern India (ISIRD, Rs.4.84 Lakhs)
8. Plant Metabolic Pathway Laboratory (MHRD, Rs.43.00 Lakhs)

### ***Consultancy Projects***

1. Analyzing European and US patent cases (Longbow Legal Ltd., Rs.4.00 Lakhs)
2. GI Registration of Traditional Handloom Textiles from Orissa (Department of Textiles, Government of Orissa, Rs.19.00 Lakhs)
3. Optimum Utilisation of Land Resources (GreenInfra Creation Pvt. Ltd., Rs.2.50 Lakhs)
4. Post Registration Measures of Sambalpuri Bandha Saree & Fabrics and Sonapur Saree & Fabrics (The Apex Handloom Weavers Co-operative Society (Boyanika), Odisha, Rs.4.00 Lakhs)
5. Study on Implementation of features in the Indian Patent office Search Platform, IPATS (Siddhast Ip Innovation Pvt) Ltd., Rs.6.00 Lakhs)

### **Visits Abroad by Faculty Members**

1. Dube, Dipa - International Conference (Singapore, ) December 9-11, 2013
2. Dube, Indrajit - To attend workshop on Responsibility and Accountability of Corporate Ownership, Copenhagen Business (Copenhagen, Denmark, ) 9th to 10th May

### **Invited Lectures by Faculty Members**

1. Arbitration under the MSME Act *by* Subramanian (National University of Juridical Sciences, Kolkata)
2. Novartis Judgement of Sec 3d *by* M. Padmavati (Chanakya Law University, Patna)
3. Welfare Implications in Pharma in Recombinant Drug segment *by* M. Padmavati (Competition Commission of India)
4. Invitation to judge Tehnology Law moot at Symbiosis Law School Pune *by* M. Padmavati (Symbiosis Law School Pune)
5. Panel Discussion Member of the 15th Year Celebration of Patent Information Centre Kolkata *by* M. Padmavati (Patent Informatics Centre, Kolkata)
6. Bioenergy plantations and impact on biodiversity *by* M. Padmavati (Goldman Public Policy School, University of Berkeley, CA, USA)
7. Sec 3d of the Indian Patent Act: Defining Metrics *by* M. Padmavati (University of Washington, Seattle, USA)
8. Bioenergy Inventions in India – IP and commercialisation *by* M. Padmavati (Management of Intellectual Property Rights and Strategy, IIT Mumbai)
9. Expert Member for the National Workshop on TK and ABS- A national Dialogue *by* M. Padmavati (Hyderabad)
10. Medicinal Plants *by* M. Padmavati (School of Natural Product Studies, Jadavpur University)
11. Benifit sharing of GIs in Orissa *by* Raju, K. D. (Sambalpur)
12. 3 Lectures on Business Method Patents *by* Raju, K. D. (DIT IPR Course Content Preparation)
13. Models of Corporate Law & Governance *by* Dube, Indrajit (Gujarat National Law University, Gandhinagar, Gujrat)
14. Comprehensive Legislation on Ganga River Basin Management *by* Dube, Indrajit (Save Ganga Mission, Mumbai)
15. Role of Regulatory Agencies in Developing Business Laws in India *by* Dube, Indrajit (National University of Study and Research in Law, Ranchi)
16. Sustainable Development through an Inclusive Approach. A myth or a fallacy? *by* Dube, Indrajit (ECO Build India,, Mumbai)

17. Trafficking of Women- A Legal Perspective *by* Dube, Dipa (Vidyasagar University, Midnapore)
18. Role of Women in Criminal Justice System *by* Dube, Dipa (National Judicial Academy, Bhopal)
19. Legal Research Methodology-Reflections & Relevance *by* Vibhute, Khushal (WB National University of Juridical Sciences (NUJS))
20. Hypothesis and Research Design in Legal Research *by* Vibhute, Khushal (WB National University of Juridical Sciences (NUJS))
21. Contribution of Supreme Court in the Development of Criminal Law and Human Rights during 2013 *by* Vibhute, Khushal (National Judicial Academy of India, Bhopal)
22. Criminal Justice System in India: An Overview *by* Vibhute, Khushal (National Judicial Academy of India, Bhopal)
23. Panel Discussion (Session Co-chair)-Contribution of High Courts in Development of Criminal Law *by* Vibhute, Khushal (National Judicial Academy of India, Bhopal)

### ***Books Published***

1. Dr. Raju KD: Company Directors - Supplement *published by* Eastern Law House (2014)
2. Indrajit Dube: Competition & Intellectual Property Law *published by* LAMBERT (2013)
3. KD Raju: Company Directors: Fiduciary Duties and Liabilities *published by* Eastern Law House, Kolkata (2013)
4. Uday Shankar: Constitutionalizing Intellectual Property *published by* Satyam Law International, Delhi (2012)
5. Vibhute: Halsbury's Laws of India, vol 10, Criminal Law 1 (2nd edn) - ISBN 978-93-5143-050-6 *published by* LexisNexis (2014)
6. Vibhute: PSA Pillai's Criminal Law (11th edn) - ISBN 978-81-8038-773-9 *published by* LexisNexis (2012)

### ***Papers Published in Journals***

1. Access to Energy: Looking Through the Prism of Human Rights – The Indian Experience *By* Uday Shankar and Surendra Sharma *The Journal of Energy and Development* Vol. 38,1 & 2, 221 (2013)
2. Anti-competitive effects on intellectual property rights: Emerging jurisprudence & lessons for India *By* Dr. Raju KD *Journal Intellectual Property Law* 18(2) (2013)
3. Competition Regulation and Recombinant Drugs in India *By* Ravikant Bhardwaj, K.D. Raju and M.Padmavati *Journal of Commercial Biotechnology* 19 (4): (2013)
4. Criminal Jurisdiction under the Law of the Sea Convention: A Case Study of Italian Naval Marines Prosecution in India *By* Dr. Raju KD *NUALS Law Journal* Vol. 8 (2014)
5. Determining the Applicability of DNA evidence in Rape Trials in India *By* Dipa Dube *International Journal of Social Science Research* Vol. 2(1)pp. 176-202 (2014)
6. Determining Unreasonable Use of IPRs under the Competition Act 2002, *By* Ravikant Bhardwaj, K. D. Raju & M. Padmavati *International Company and Commercial Law Review (ICCLR)* 24 (6), (2013)
7. Elusive Quest for Right to Access to Internet in the Indian Legal Landscape *By* Uday Shankar and Saurabh Bindal *Rostrum's Law Review* Vol. I, Is. III, 79 (2013)
8. Geographical Indications in Odisha: A Leading Destination of Traditional Handlooms *By* KD Raju and Seema Chaudhary *Odisha Review* Vol.LXIX, No.9, pp.3 (2013)
9. Herbal Drug Regulation and Commercialization: An Indian Industry Perspective *By* Niharika Sahoo, Padmavati Manchikanti *The Journal of Alternative and Complementary Medicine* 16 (2013)
10. How Important is Water - As a Human Right in India *By* Himanshu Shekhar, Uday Shankar and Dipa Dube *Indian Human Rights Law Review* Vol. 4, No.1, 129 (2013)

11. Impact of Patent Linkage on Marketing of Generic Drugs By Ravikant Bhardwaj, K.D. Raju and M.Padmavati *Journal of Intellectual Property Rights* 18 (4) (2013)
12. Is Corporate Succession Plan Important? Reading From India By Indrajit Dube & Sunil Phatak *Journal on Governance* (2013)
13. Law and Process of Investigation by CBI: Issues & Perspectives By Bhagwan R. Gawali & Dipa Dube *Indian Journal of Human Rights & Law* Vol. 10(1&2), 51-78 (2013)
14. Legal Protection to Online Privacy vis-à-vis Growth of E-Commerce: An Empirical Study By Gargi Rajvanshi, Dr. Indrajit Dube & Dr. Tapas k. Bandhyopadhyay *Journal of Telecommunication and Broadcasting Law* Vol 2 (2013)
15. Millennium Development Goals and Socio-Economic Rights – Indian Position By Uday Shankar and Saurabh Bindal *GNU Journal of Law, Development and Politics* Vol. 3, Issue -2, 41 (2013)
16. Non-judicial Review in Ethiopia: Constitutional Paradigm, Premise and Precinct By Vibhute *African Journal of International and Comparative Law* 22(1), 120-139 (2014)
17. Public Opinion in the Wake of Nirbhaya Gang Rape- Ominous Signs for India By Dipa Dube *Journal of Advanced Research in Management & Social Science* Vol. 3(1), 89-103 (2014)
18. Role of Independent Director in Corporate Governance - Reference to India By Indrajit Dube & Aparup Pakhira *Journal of Corporate Board: Role, Duties and Composition* Vol 9 Issue 1 p 50 (2013)
19. Treaty Shopping- Less Tax with Positioning of Conduits By Gaurav Shukla, Dr. Ajay Kumar *Corporate Professionals Today* Vol.27part 5p.422 (2013)

#### ***Papers Presented in Conferences***

1. Access to Clean Energy: Human Rights Perspective, By Uday Shankar, *International Symposium on New Horizons in Bio-Energy Research*, P. K. Sinha Centre of Bio Energy, (2013)
2. Adjudication by Judiciary of Socio-Economic Rights: A Comparative Study between India and South Africa, By Uday Shankar, *10th ASLI Conference*, NLSIU, Bangalore, (2013)
3. “Criminal Law Amendment Act 2013: Does not Make Any Difference?”, By Gaurav Shukla, *National Seminar on Crime Against Women and Criminal Law (Amendment) Act 2013*, MATS Law School, MATS University, Raipur, (2013)
4. Bioenergy Inventions in India – IP and commercialisation, By Padmavati Manchikanti Mahasweta Sengupta, *Management of Intellectual Property Rights and Strategy*, IIT Mumbai, (2014)
5. Cyber Crimes Against Women, By Nilima Sarangi, Dr. Raju KD and Dr. Dipa Dube, *37th All India Criminology Conference*, National Law School, Patiala, (2014)
6. Diplomatic Immunity, By Dr. Raju KD, *Annual General Conference of ISIL*, ISIL, New Delhi, (2014)
7. Evolving Frame Work of International Trade Law, By KD Raju, *International Conference on Trade and Competition*, National Law School, Gandhi Nagar, (2013)
8. GI Benefit Sharing, By Shivangi Tiwari and Dr. Raju KD, *National Conference on IPR*, Delhi University, (2014)
9. Judicial Review and Policy Decision, By Uday Shankar, *National Seminar on “Judicial Review of Legislation, Executive and Administrative Decision: Need of Equilibrium*, NUSRL, Ranchi, (2013)
10. Justice in the Neighbourhood, By Dipa Dube, *5th Asian Society of Criminology Conference*, TISS, Mumbai, (2013)
11. Live-in Relationship-Some Reflections on Legal Aspects & Contraversies, By Prof Khushal Vibhute, *National Seminar on Live-in Relationship and Right to Maintenance*, Utkal University, Bhubneswar, (2013)

12. Panel Discussion (Session Chair) Law on Geographical Indication, *By* Prof Khushal Vibhute, *Management of Intellectual Property Rights and Strategy (MIPS 2014)*, IIT Mumbai, (2014)
13. Pollution of River Ganga in West Bengal, *By* Rajrupa Sinha Roy, Indrajit Dube, Dipa Dube, *International Conference on Comparative Law and Development*, University of Delhi, Delhi, (2014)
14. Right to Drinking Water in India, *By* Uday Shankar, *International Workshop on Socio-Economic Rights in Comparative Perspectives*, New Delhi, (2013)
15. Use of DNA Evidence in Rape Trials in India, *By* Dipa Dube, *International Conference on Forensic Science and Criminalistics*, Singapore, (2013)

# **Ranbir and Chitra Gupta School of Infrastructure Design and Management**

## ***Head***

Prof. Uttam Kumar Banerjee

## ***New Academic Programmes***

The School currently offers one M.Tech programme in "Infrastructure Design and Management". The first batch of M.Tech students has been admitted during the 2008-2009 academic year

## ***Brief Description of on-going activities***

The school was inaugurated by Padma Bhushan Professor Lord Shusantha Kumar Bhattacharyya of Warwick Manufacturing group on 18th of August 2008 (Institute Foundation Day). An advisory Council comprising eminent experts from different fields as external experts has been constituted. The first meeting of the advisory council meeting was held on 29th March 2009

## ***Thrust Areas***

1. Transportation engineering (Planning, design, operation and management of highways, airport and seaport infrastructure) Environmental Engineering (Planning, design, operation and management of water supply and waste management systems, Environmental Impact Assessment) Facilities Infrastructure (Urban infrastructure planning and design, Facility programming and specialized building design, building automation systems design, building management systems, regional infrastructure planning and construction) Power systems (Planning, design, operation and management of Thermal, hydel and Nuclear Power Plants, Renewable Power Plants, Power generation, transmission and distribution, power system planning and reliability) Infrastructure Project management Infrastructure Financing and Infrastructure Regulatory Issues

## ***New Acquisitions***

1. The school has acquired 10 desk top computers, PRIMAVERA and MX Roads softwares



## School of Information Technology

### **Head**

Prof. Rajib Mall

### **Professors**

Ghosh, Soumya Kanti      *Ph.D.*, Geospatial Database and Web Services, Network Security, Cloud Computing

Gupta, Arobinda      *Ph.D.(Iowa)*, Distributed Systems, Mobile Computing

Sural, Shamik      *Ph.D.*, Information and System Security, Image and Video Processing

### **Associate Professors**

Misra, Sudip      *Ph.D.(Carleton Univ., Canada)*, Wireless Ad Hoc and Sensor Networks, Internet of Things and Cyber Physical Systems, Computer Networks, Smart Grid Communication, Cloud Computing, Bio-Sensor Networks

Samanta, Debasis      *Ph.D.(IIT Kharagpur)*, Biometric Based System security, Big Data Security and Analysis, Human Computer Interaction, Computational Intelligence

Sreenivasa Rao, Krothapalli      *Ph.D.(IIT, Madras)*, Speech Processing, Multimedia Signal Processing, Pattern Recognition, Neural Networks

### **Assistant Professor**

Sahay, Rajiv Ranjan      *Ph.D.(IIT Madras)*, Human Computer Interaction, Teaching:, Image Processing, Digital Image Processing (EE60062) (Autumn), Mathematical Foundations for Signal and Image Processing (IT60121) (Autumn), Statistical Signal Processing (EE60102) (Spring), Advanced Image Processing and Computer Vision (CS 60052) (Spring), Computer Vision, Multimedia

### **Brief Description of on-going activities**

Computer and Communication Networks: Development of architectures, protocols and algorithms for mobile ad-hoc networks, vehicular ad-hoc networks, wireless sensor networks and wireless mesh networks, smart grid communications, cloud computing. Geographical Information System: Enterprise-wide GIS database development and its policies and protocols to make it accessible as platform independent and support for decision making are under research and development. Human Computer Interaction: Development of user interfaces for the under privileged users such as language illiterate, physically disabled etc. Application of Information Communication Technology (ICT) for the mass such as multimodal interaction, multimodal text composition mechanism, user modeling, interface adaptation, personalization, evaluation are the some areas of research. Computational modeling to brain for informatics, cognitive behavior is also another active area of research. Speech Processing: Researchers working in this area are focusing on characterization and incorporation of emotions in speech, speaker recognition system for handheld devices in varying background environments and development of Text-to-Speech (TTS) system for Indian languages. Network Security: Various areas of network security are being explored, like penetrating testing, development of new algorithms for cryptography, their efficient and attack-resistant hardware implementation etc. Systems Security: Survivable information system architecture to tolerant with potential information warfare attacks is under development. Such systems are typically characterized by the presence of a

large repository of sensitive data in a distributed environment. The architecture takes into account the presence of multiple operating systems and database platforms, their known and potential vulnerabilities as well as possibilities of simultaneous attacks from adversaries. It will be developed as a generic model which can be used to build specific information systems in a number of application domains like e-governance, finance and insurance, education, etc.

### ***Thrust Areas***

1. Distributed computing, wireless ad hoc and sensor networks, cloud computing, ubiquitous computing, network security, database systems and data mining, systems security, human computer interaction, geographical information system, speech processing, computer vision, VLSI design.

### ***International Collaborations***

1. Prof. Gerhard Rigoll, Dept. of EE, Technical University of Munich, Germany
2. Prof. V. Atluri, Dept. of MSIS, Rutgers University, USA

### ***Lectures by Visiting Experts***

1. A computational framework for exploring the role of speech production in speech processing/recognition *by* Dr. Prasanta Kumar Ghosh (University of Southern California (USC), Los Angeles, USA)
2. GCC Compiler Design Reserach *by* Prof. U. P. Khedkar (Indian Institute of Technology Bombay)
3. Cell Phone – the Most Trusted Personal Device (MTPD) for Universal Applications *by* Dr. Amalendu Chatterjee (Univista Inc. USA)

### ***Member - Professional Bodies***

1. Sural, Shamik, *Senior Member* - IEEE
2. Samanta, Debasis, *Senior Mameber* - IEEE
3. Sreenivasa Rao, Krothapalli, *Regular member* - IEEE Signal Processing Society
4. Sreenivasa Rao, Krothapalli, *Member* - ACM
5. Sreenivasa Rao, Krothapalli, *Regular member* - International Speech Communication Association (ISCA)
6. Sreenivasa Rao, Krothapalli, *Life Member* - Indian Society for Technical Education (ISTE)
7. Sreenivasa Rao, Krothapalli, *Senior Member* - IEEE
8. Misra, Sudip, *Senior Member* - IEEE
9. Misra, Sudip, *Member* - ACM
10. Sahay, Rajiv Ranjan, *Member* - IEEE
11. Ghosh, Soumya Kanti, *Member* - IEEE
12. Gupta, Arobinda, *Regular* - ACM
13. Gupta, Arobinda, *Regular* - ACM
14. Gupta, Arobinda, *Regular* - IEEE
15. Gupta, Arobinda, *Regular* - IEEE

### ***Member - Editorial Board***

1. Misra, Sudip (2011) *Associate Editor* - EURASIP Journal on Wireless Communications and Networking
2. Misra, Sudip (2011) *Associate Editor* - International Journal of Communication Systems (Wiley)
3. Misra, Sudip (2011) *Editorial Board Member* - IET Wireless Sensor Systems

4. Misra, Sudip (2011) *Associate Editor* - Security and Communication Networks (Wiley)
5. Misra, Sudip (2011) *Editorial Board Member* - IET Networks
6. Misra, Sudip (2011) *Editor-in-Chief* - International Journal of Communication Networks and Distributed Systems (Inderscience)
7. Misra, Sudip (2011) *Associate Editor* - Telecommunication Systems Journal (Springer SBM)
8. Samanta, Debasis (2009) *Member of the Editorial Board* - International Journal of Communication Networks and Distributed Systems
9. Samanta, Debasis (2008) *Honorary Member of the Editorial Board* - International Journal of Bio-Science and Technology
10. Samanta, Debasis (2008) *Member of the Editorial Board* - ICFAI University Journal of Information

### ***Awards & Honours***

1. Misra, Sudip (2013) *Best Paper Award in CITS 2013 (Computer Systems Track), Piraeus-Athens, Greece*
2. Misra, Sudip (2013) *Best Paper Award, IEEE HEALTHCOM 2013, Lisbon, Portugal*
3. Misra, Sudip (2012) *IEEE ComSoc Asia Pacific Outstanding Young Researcher Award (Awarded during APB Meeting, IEEE GLOBECOM, USA)*

### ***Sponsored Research Projects***

1. Accurate analysis of vocal folds activity for speech and biomedical applications (AVS) (MHRD, Govt. of India., Rs.33.00 Lakhs)
2. Centre of Excellence in robotics (CEE) (SRIC, IIT KHARAGPUR, Sponsored Research & Industrial Consultancy, IIT Kharagpur, Rs.531.75 Lakhs)
3. Characterization and incorporation of emotions in speech (ISIRD, IIT Kharagpur, Rs.3.00 Lakhs)
4. Decoding and exploring ancient classification of Indian music through machine learning method and audience response (ITA) (MHRD, Govt. of India., Rs.150.00 Lakhs)
5. Design and Development of Integrated Security Risk Management for an Enterprise Network (Department of Information Technology, New Delhi, Rs.73.13 Lakhs)
6. Development of Algorithms for Identifying Individuals using Gait in the presence of Occlusion (CSIR, Rs.12.89 Lakhs)
7. Development of an GeoSMS Framework to facilitate Location based Services (DST, New Delhi, Rs.26.85 Lakhs)
8. Development of Feasibility Assessment Model for Adaptation of Underground Coal Gasification Technology in the North-East Region of India (Department of Electronics and Information Technology, Govt. of India, Rs.32.14 Lakhs)
9. Development of text to speech (TTS) synthesis system for Indian languages (Phase-II) (Department of Information Technology, Govt. of India., Rs.97.94 Lakhs)
10. Measurement to Management (M2M): Improved Water Use Efficiency and Agricultural Productivity Through Experimental Sensor Network (ITRA, Media Lab Asia, Rs.155.64 Lakhs)
11. Prosodically guided phonetic engine for searching speech databases in Indian languages (Department of Information Technology, Govt. of India., Rs.60.38 Lakhs)
12. Speaker recognition system for handheld devices in varying background environments (Department of Science and Technology, Govt. of India., Rs.23.03 Lakhs)
13. Standardization of Virtual Keyboards in Indic Languages (Department of Electronics and Information Technology (DeitY), Rs.22.00 Lakhs)
14. Synthesis of Low Power High Performance Mixed VLSI CMOS Circuits (Department of Science and Technology, Govt. of India, Rs.26.00 Lakhs)
15. Target tracking in Distributed Wireless Sensor Networks in the Presence of Misbehaving Nodes (ISIRD, IIT Kharagpur, Rs.5.00 Lakhs)

16. Towards Robust, Efficient and Secure Data Acquisition in Underwater Sensor Networks (Department of Electronics and Information Technology, Govt. of India, Rs.54.22 Lakhs)
17. Virtual Lab in Software Engineering (Ministry of Human Resource Development, Rs.42.00 Lakhs)
18. Virtual Labs: Advanced Network Technology (MHRD, Rs.35.00 Lakhs)
19. Virtual Labs: Software Engineering (MHRD, Rs.35.00 Lakhs)

### ***Consultancy Projects***

1. Checking Border Violation by Civilians Through Technological Solution (Border Security Force (BSF), India, Rs.3.06 Lakhs)
2. Design & Development of a Penetration Testing and Security Assessment Tool, (Ministry of Defence, New Delhi, Rs.49.00 Lakhs)

### ***Patents (filed / granted)***

1. Recovering 3D structure using blur and parallax, Rajiv R. Sahay and A.N. Rajagopalan

### **Visits Abroad by Faculty Members**

1. Sural, Shamik - Research Collaboration and Conference Paper Presentation (Rutgers University, New Jersey, USA, ) July 10-19, 2013
2. Ghosh, Soumya Kanti - Presenting paper in IEEE TrustCom 2013 (Melbourne, Australia, ) 15-19 July 2013
3. Misra, Sudip - Avail Humboldt Fellowship (Hamburg, Germany, ) May-July 2013
4. Misra, Sudip - Attend conference (Budapest, Hungary, ) June 2013
5. Misra, Sudip - Attend conference (Cagliari, Sardinia, Italy, ) July 2013

### **Invited Lectures by Faculty Members**

1. Routing in Delay Tolerant Networks *by* Gupta, Arobinda (IIT Guwahati)
2. Self-Stabilizing Distributed Algorithms *by* Gupta, Arobinda (ISI Kolkata)
3. Distributed Algorithms *by* Gupta, Arobinda (NIT Durgapur)
4. Speech Interface to Mobile Phones *by* Sreenivasa Rao, Krothapalli (PVP Siddhartha Institute of Technology, Vijayawada, Andhra Pradesh)
5. Challenges in Text-to-Speech Synthesis *by* Sreenivasa Rao, Krothapalli (Balasore Engineering College, Balasore, Orissa.)
6. Gait Based Human Recognition *by* Sural, Shamik (American Chamber Of Commerce in India, Kolkata)
7. Importance of Prosody in Various Speech Applications *by* Sreenivasa Rao, Krothapalli (NITK, Suratkal)
8. Speech Processing in Mobile Environments *by* Sreenivasa Rao, Krothapalli (V R Siddhartha Engineering College, Vijayawada)
9. Introduction to Speech Signal Processing *by* Sreenivasa Rao, Krothapalli (RVR & JC College of Engineering, Guntur)
10. Acquisition and Incorporation of Prosody for Text-to-speech Synthesis *by* Sreenivasa Rao, Krothapalli (DAICT, Gandhi Nagar)
11. Crypto-Biometric System for Big Data Security *by* Samanta, Debasis (NIT Durgapur)
12. Opportunistic Mobile Networks: Challenges and Research Trends *by* Misra, Sudip (Advanced Wireless Communications and Networking Workshop, NIT Durgapur)
13. Recent Research Trends in Underwater Sensor Networks *by* Misra, Sudip (National Seminar on Wireless Sensor Networking: The Recent Challenges, Bhubaneswar, India)

14. Opportunistic Mobile Networks: Challenges and Research Trends by Misra, Sudip (2nd National Conference on Innovative and Emerging Technologies (NCIET - 2014), Gujarat, India)

### ***Books Published***

1. C. R. Kalmanek, S. Misra and R. Yang (Eds.): Guide to Reliable Internet Services and Applications *published by* Springer-Verlag (2010)
2. I. Woungang, S. C. Misra and S. Misra (Eds.): Selected Topics in Information and Coding Theory *published by* World Scientific (2010)
3. K. Sreenivasa Rao and Shashidhar G. Koolagudi: Robust Emotion Recognition using Spectral and Prosodic Features *published by* Springer (2013)
4. M. S. Obaidat and S. Misra (Eds.): Cooperative Networking *published by* John Wiley & Sons (2011)
5. S. Misra, I. Woungang and S. C. Misra (Eds.): Guide to Wireless Sensor Networks *published by* Springer (2009)
6. S. Misra, I. Woungang and S. C. Misra (Eds.): Guide to Wireless Ad Hoc Networks *published by* Springer (2009)
7. S. Misra, S. C. Misra and I. Woungang (Eds.): Selected Topics in Communication Networks and Distributed Systems *published by* World Scientific (2009)
8. S. Misra, S. C. Misra and I. Woungang (Eds.): Guide to Wireless Mesh Networks *published by* Springer (2008)

### ***Papers Published in Journals***

1. A Review on Telemedicine-Based WBAN Framework for Patient Monitoring *By* C Chakraborty, B Gupta, Soumya K Ghosh *Telemedicine and e-Health Journal* 19(8) (2013)
2. A Web-based Integrated Environment for Simulation and Analysis with NS-2 *By* B. Saha, S. Misra and M. S. Obaidat *IEEE Wireless Communications* 20 109-115 (2013)
3. AMTRAC: An Administrative Model for Temporal Role-based Access Control *By* Manisha Sharma, Shamik Sural, Vijay Atluri and Jaideep Vaidya *Computers & Security* 39(B), pp. 201-218 (2013)
4. An Approach to Design Virtual Keyboards for Text Composition in Indian Languages *By* Debasis Samanta, Sayan Sarcar, Soumalya Ghosh *International Journal of Computer Human Intercation* 29, 516-540 (2013)
5. Analysis on Users Errors in Virtual Keyboards *By* Soumalya Ghosh, Debasis Samanta *International Journal of Computer Application* 45(2), 145-151 (2014)
6. Classification of Infant Cries Using Dynamics of Epoch Features *By* Avinash Kumar Singh, Jayanta Mukhopadhyay, K. Sreenivasa Rao and Kapinaiah Viswanath *Journal of Intelligent Systems* Vol. 22, 253-267 (2013)
7. Clustering Non-Ordered Discrete Data *By* A. Watve, S. Pramanik, S. Jung, B. Jo, S. Kumar and Shamik Sural *Journal of Information Science and Engineering* 30(1), pp. 1-23 (2014)
8. Clustering Web Search Results to Identify Information Domain *By* Santa Maity, Debasis Samanta *Emerging Trends in Computing and Communication* 298, 291-303 (2014)
9. Detection of Vowel Offset Point from Speech Signal *By* Jainath Yadav and K. Sreenivasa Rao *IEEE Signal Processing Letters* Vol. 20, 299-302 (2013)
10. Emotion Recognition from Speech using global and local prosodic features *By* K. Sreenivasa Rao, Shashidhar G Koolagudi and Ramu Reddy Vempada *International Journal of Speech Technology (Springer)* Vol. 16, 143-160 (2013)
11. Existence of Dumb Nodes in Stationary Wireless Sensor Networks *By* S. Misra, P. Kar, A. Roy, M. S. Obaidat *Journal of Systems and Software (Elsevier)* 91 135-146 (2014)
12. Face Images Database Indexing for Person Identification Problem *By* Jyotirmay Dewangan, Somnath Dey, Debasis Samanta *International Journal of Biometrics and Bioinformatics* 7(2), 741-753 (2013)

13. Finding Overlapping Communities in a Complex Network of Social Linkages and Internet of Things By R. Barthwal, S. Misra, M. S. Obaidat *The Journal of Supercomputing (Springer)* 66 1749-1772 (2013)
14. Fingerprint Indexing using Minutiae-based Invariable Set of Multidimensional Features By Somnath Dey, Om Prakash Singh, Debasis Samanta *International Journal of Biometrics (IJBM)* Accepted (2014)
15. Green Wireless Body Area Nano-networks: Energy Management and the Game of Survival By S. Misra, N. Islam, J. Mahapatro, J. J. P. C. Rodrigues *IEEE Journal of Biomedical and Health Informatics* 18 467-475 (2014)
16. Hazy image enhancement based on the full-saturation assumption By Yangyang Xiang, Rajiv R. Sahay, Mohan Kankanhalli *accepted in IEEE International Conference on Multimedia and Expo Workshops (ICMEW), San Jose, USA* (2013)
17. Learning Automata-Based Virtual Backoff Algorithm for Efficient Medium Access in Vehicular Ad Hoc Networks By P. V. Krishna, S. Misra, V. Saritha, H. Agarwal and N. Chilamkurti *Journal of Systems Architecture (Elsevier)* 59 968-975 (2013)
18. Line Coverage Measures in Wireless Sensor Networks By Dinesh Dash, Arobinda Gupta, Arijit Bishnu, Subhas C. Nandy *Journal of Parallel and Distributed Computing* Accepted (2014)
19. Meeting Cardinality Constraints in Role Mining By P. Harika, M. Nagajyothi, John C. John, Shamik Sural, Jaideep Vaidya and Vijay Atluri *IEEE Transactions on Dependable and Secure Computing* to appear (2014)
20. Non-Uniform Time Scale Modification Using Instants of Significant Excitation and Vowel Onset Points By K. Sreenivasa Rao and Anil Kumar Vuppala *Speech communication (Elsevier)* Vol. 55, 745-756 (2013)
21. On Network Lifetime Expectancy With Realistic Sensing and Traffic Generation Model in Wireless Sensor Networks By A. Chakraborty, R.R. Rout, A. Chakrabarti, Soumya K Ghosh *IEEE Sensors Journal* 13(7) (2013)
22. Pitch Synchronous and Glottal Closure based Speech Analysis for Language Recognition By K. Sreenivasa Rao, Sudhamay Maity and V. Ramu Reddy *International Journal of Speech Technology (Springer)* Vol. 16, 413-430 (2013)
23. Pose Depth Volume Extraction from RGB-D Streams for Frontal Gait Recognition By Pratik Chattopadhyay, Aditi Roy, Shamik Sural and J. Mukherjee *Journal of Visual Communication and Image Representation* 25(1), pp. 53-63 (2014)
24. Recognition of emotions from video using acoustic and facial features By K. Sreenivasa Rao and Shashidhar G Koolagudi *Signal Image and Video Processing (Springer)* Accepted (2014)
25. Recognition of Indian languages using multi-level spectral and prosodic features By V. Ramu Reddy, Sudhamay Maity and K. Sreenivasa Rao *International Journal of Speech Technology (Springer)* Vol. 16, 489-510 (2013)
26. RLAM: A Dynamic and Efficient Reinforcement Learning based Adaptive Mapping Scheme in Mobile WiMAX Wireless Networks By M. Louta, P. Sarigiannidis, S. Misra, P. Nicopolitidis, G. Papadimitriou *Mobile Information Systems (IOS Press)* 10 173-196 (2014)
27. Seeing through the fence: Image de-fencing using a video sequence By Vrushali S. Khasare, Rajiv R. Sahay, Mohan Kankanhalli *accepted in IEEE International Conference on Image Processing (ICIP), Melbourne, Australia* (2013)
28. Skew Correction of Document Images by Rank Analysis in Farey Sequence By Sanjoy Pratihari, Partha Bhowmick, Shamik Sural and Jayanta Mukhopadhyay *International Journal of Pattern Recognition and Artificial Intelligence* 27(7), pp. 1-35 (2013)
29. Speaker Identification under Background Noise using Features Extracted from Steady Vowel Regions By Anil Kumar Vuppala and K. Sreenivasa Rao *International Journal of Adaptive control and Signal processing (Wiley)* Vol. 27, 781-792 (2013)
30. Super-resolution de-fencing: Simultaneous fence removal and high-resolution image recovery using videos By Chetan S. Negi, Koyel Mandal, Rajiv R Sahay and Mohan Kankanhalli

- IEEE International Conference on Multimedia and Expo Workshops (Mobile Media Computing), China* (2014)
31. Tic-Tac-Toe-Arch: A Self-organizing Virtual Architecture for Underwater Sensor Networks By T. Ojha, M. Khatua and S. Misra *IET Wireless Sensor Systems* 3 307-316 (2013)
  32. Towards Full Network Virtualization in Horizontal IaaS Federation: Security Issues By Anant V Nimkar and Soumya K Ghosh *Journal of Cloud Computing: Advances, Systems and Applications* 2(19) (2013)
  33. Two-Stage Intonation Modeling using Feedforward Neural Networks for syllable based Text-to-Speech Synthesis By V. Ramu Reddy and K. Sreenivasa Rao *Computer Speech and Language (Elsevier)* Vol. 27, 1105-1126 (2013)
  34. Word Prediction System for Text Entry in Hindi By Manoj Kumar Sharma, Debasis Samanta *Transactions on Asian Language Information Processing (TALIP)* Accepted (2014)

### **Papers Presented in Conferences**

1. A Fault-Tolerant Routing Protocol for Dynamic Autonomous Unmanned Vehicular Networks, By S. Misra, P. V. Krishna, H. Agarwal, A. V. Vasilakos, V. Saritha and M. S. Obaidat, *Proceedings of the IEEE International Conference on Communications (IEEE ICC 2013)*, Budapest, Hungary, (2013)
2. A mobility aware scheduler for low cost charging of electric vehicles in smart grid, By J. C. Mukherjee, A. Gupta, *COMSNETS 2014*, Bangalore, (2014)
3. A Syllable-Based Framework for Unit Selection Synthesis in 13 Indian Languages, By Hemant A Patil, K Sreenivasa Rao, N P Narendra et. al., *16th International Oriental COCOSDA Conference (IEEE Explore)*, Gurgoan, India, (2013)
4. An Administrative Model for Spatio-Temporal Role based Access Control, By Manisha Sharma, Shamik Sural, Vijay Atluri and Jaideep Vaidya, *International Conference on Information Systems Security*, Kolkata, India, (2013)
5. Analysis of Detection of Vowel Offset Point for Coded Speech, By Jainath Yadav and K. Sreenivasa Rao, *6th International Conference on Contemporary Computing (IC3), IEEE Explore*, IIIT, Noida, India, (2013)
6. Analysis of Language Identification Performance based on Gender and Hierarchical Grouping Approaches, By Bellamkonda Bhaskar, Dipanjan Nandi and K. Sreenivasa Rao, *International Conference on Natural Language Processing (ICON-2013)*, CDAC, Noida, India, (2013)
7. Analysis of Spatial Autocorrelation for Accident Data Based on Spatial Decision Tree, By Shrutilipi Bhattacharjee, Bimal Ghimire, and Soumya K. Ghosh, *4th International Conference on Computing for Geospatial Research and Application (Com.Geo 2013)*, CA, USA, (2013)
8. Analysis of TRBAC with Dynamic Temporal Role Hierarchies, By Emre Uzun, Vijayalakshmi Atluri, Jaideep Vaidya and Shamik Sural, *27th IFIP WG 11.3 Conference on Data and Applications Security and Privacy (DBSEC 2013)*, Newark, USA, (2013)
9. Automatic Phonetic and Prosodic Transcription for Speech Documents in Indian languages: Bengali and Oriya, By R Ravi Kiran, Sunil Kumar, Manjunath K E, Apoorv Chaturvedi, Biswajit Satapathy, Debadatta Pati and K. Sreenivasa Rao, *International Conference on Natural Language Processing (ICON-2013)*, CDAC, Noida, India, (2013)
10. Automatic Phonetic Transcription for Read, Extempore and Conversation Speech for an Indian Language: Bengali, By Manjunath K. E. and K. Sreenivasa Rao, *National Conference on Communications (NCC-2014)*, IIT Kanpur, Kanpur, India,, (2014)
11. Catastrophic Collision in Bio-nanosensor Networks: Does it really matter?, By N. Islam, S. Misra, J. Mahapatro, J. J. P. C. Rodrigues, *Proceedings of IEEE HEALTHCOM 2013, the IEEE 15th International Conference on e-Health Networking, Applications and Services*, Lisbon, Portugal, (2013)

12. Colored Rubber Stamp Removal from Document Images, *By* Soumyadeep Dey, Jayanta Mukherjee, Shamik Sural and Partha Bhowmick, *5th International Conference on Pattern Recognition and Machine Intelligence*, Kolkata, India, (2013)
13. Delay Tolerant Networks as Spatio-Temporal Networks (Poster), *By* R. R. Maiti, A. Gupta, N. Ganguly, *IEEE INFOCOM*, Turin, Italy, (2013)
14. Development of Consonant-Vowel Recognition Systems for Indian Languages: Bengali and Oriya, *By* Manjunath K E, Sunil Kumar. S. B, Debadatta Pati, Biswajit Satapathy and K. Sreenivasa Rao, *IEEE INDICON (IEEE Explore)*, IIT Bombay, Mumbai, India., (2013)
15. Development of Phonetic Engine for Indian Languages: Bengali and Oriya, *By* Manjunath K E, K. Sreenivasa Rao and Debadatta Pati, *16th International Oriental COCOSDA Conference (IEEE Explore)*, Gurgoan, India, (2013)
16. Dynamic Coalition Formation in a Smart Grid: A Game Theoretic Approach, *By* A. Mondal and S. Misra, *Proceedings of the IEEE International Conference on Communications (IEEE ICC13) – 3rd IEEE International Workshop on Smart Communication Protocols and Algorithms (SCPA 2013)*, Budapest, Hungary, (2013)
17. Dynamic Relay Selection for MAC-level Retransmission in Vehicular Ad Hoc Networks, *By* B. Das, S. Misra, U. Roy, M. S. Obaidat, *Proceedings of IEEE GLOBECOM 2013*, Atlanta, GA, USA, (2013)
18. Effect of near-surface bubble plumes on the acoustic signal used in UWACNs, *By* A. K. Mandal, S. Misra and M. Dash, *Proceedings of the 9th International Wireless Communications and Mobile Computing Conference (IWCMC 2013)*, Cagliari, Italy, (2013)
19. Emotional-speech synthesis from neutral-speech using prosody imposition, *By* Jainath Yadav and K. Sreenivasa Rao, *International Conference on Recent Trends in Computer Science and Engineering (ICRTCSE-2014)*, Central University of Bihar, Patna, Indi, (2014)
20. Error Quantifying Metrics for Text Entry Systems Augmented with Word Prediction, *By* Manoj Kumar Sharma, Pradipta Kumar Saha, Sayan Sarcar, Debasis Samanta, *11th Asia Pacific Conference on Computer Human Interaction (APCHI)*, Bangalore, India, (2013)
21. Exploring and Effective Interaction Mode for Visually Impaired People, *By* Tuhin Chakrabarty, Debasis Samanta, *Joint conference on APCHI 2013 and IndiaHCI 2013*, Bangalore, India, (2013)
22. Eyeboard++ : An Enhanced Eye Gaze-based Text Entry System in Hindi, *By* Sayan Sarcar and Debasis Samanta, *Joint conference on APCHI 2013 and IndiaHCI2013*, Bangalore, India, (2013)
23. Formal Representation of Fuzzy Data Model Using Description Logic, *By* I Bhattacharya, Soumya K Ghosh, *13th International Conference on Computational Science and Its Applications (ICCSA 2013)*, Springer Berlin Heidelberg, Ho Chi Minh City, Vietnam, (2013)
24. Gait Recognition from Front and Back View Sequences captured using Kinect, *By* Pratik Chattopadhyay, Shamik Sural and J. Mukherjee, *5th International Conference on Pattern Recognition and Machine Intelligence*, Kolkata, India, (2013)
25. GeoSMS Framework for Information Acquisition in Rural Public Health Management System, *By* Arindam Dasgupta, Rohan Kamble, Soumya K Ghosh, P S Acharya, *IEEE INDICON 2013*, IIT Bombay, India, (2013)
26. High quality text-to-speech synthesis system with efficient duration models developed using coding schemes based on vowel production characteristics, *By* V. Ramu Reddy and K. Sreenivasa Rao, *13th International Conference on Intelligent Systems Design and Applications (ISDA-13)*, Universiti Putra Malaysia, Malaysia, (2013)
27. Infant Cry Recognition using Excitation Source Features, *By* Avinash Kumar Singh, Jayanta Mukhopadyay, Sunil Kumar S B and K. Sreenivasa Rao, *IEEE INDICON (IEEE Explore)*, IIT Bombay, Mumbai, India., (2013)
28. Language Identification using Hilbert Envelope and Phase Information of Linear Prediction Residual, *By* Dipanjan Nandi, Debadatta Pati and K. Sreenivasa Rao, *16th International Oriental COCOSDA Conference (IEEE Explore)*, Gurgoan, India, (2013)
29. Learning Automata Based Sentiment Analysis for Recommender System on Cloud, *By* P. V. Krishna, S. Misra, D. Joshi, M. S. Obaidat, *Proceedings of the 2013 International*



- Conference on Computer, Information and Telecommunication Systems (CITS 2013)*, Piraeus-Athens, Greece, (2013)
30. Mapping of Sensor Nodes with Servers in a Mobile Health-Cloud Environment, By S. Das, S. Misra, M. Khatua, J. J. P. C. Rodrigues, *Proceedings of IEEE HEALTHCOM 2013, the IEEE 15th International Conference on e-Health Networking, Applications and Services*, Lisbon, Portugal, (2013)
  31. MDS-based Trust Estimation Model for Vehicular Ad-hoc Network, By T R V Krishna, R P Barnwal and Soumya K Ghosh, *12th IEEE International Conference on Trust, Security and Privacy in Computing and Communications (IEEE TrustCom-2013)*, Melbourne, Australia, (2013)
  32. Mobility Aware Charge Scheduling of Electric Vehicles for Imbalance Reduction in Smart Grid, By J. C. Mukherjee, A. Gupta, *ICDCN 2014*, Coimbatore, (2014)
  33. Multilingual Speaker Recognition on Indian Languages, By Sourjya Sarkar, K. Sreenivasa Rao and Dipanjan Nandi, *IEEE INDICON (IEEE Explore)*, IIT Bombay, Mumbai, India., (2013)
  34. On Asynchronous Flow Scheduling for Wireless Body Sensor Networks, By L. Zhou, J. Chen, B. Zheng, I. de la Torre, S. Misra, *Proceedings of IEEE HEALTHCOM 2013, the IEEE 15th International Conference on e-Health Networking, Applications and Services*, Lisbon, Portugal, (2013)
  35. Phonetic and Prosodically Rich Transcribed Speech Corpus in Indian Languages: Bengali and Oriya, By Sunil Kumar S B, K. Sreenivasa Rao and Debadatta Pati, *16th International Oriental COCOSDA Conference (IEEE Explore)*, Gurgoan, India, (2013)
  36. Re-targeting of Multi-Script Document Images for Handheld Devices, By Soumyadeep Dey, Jayanta Mukhopadhyay, Shamik Sural and Partha Bhowmick, *4th International Workshop on Multilingual OCR*, Washington DC, USA, (2013)
  37. Real Time Falls Prevention and Detection with Biofeedback Monitoring Solution for Mobile Environments, By E. T. Horta, I. C. Lopes, J. J. P. C. Rodrigues, S. Misra, *Proceedings of IEEE HEALTHCOM 2013, the IEEE 15th International Conference on e-Health Networking, Applications and Services*, Lisbon, Portugal, (2013)
  38. Residential Energy Management in Smart Grid: A Markov Decision Process-Based Approach, By S. Misra, A. Mondal, S. Banik, M. Khatua, S. Bera, M. S. Obaidat, *Proceedings of the IEEE International Conference on Internet of Things (IEEE iThings 2013)*, Beijing, China, (2013)
  39. Robustness of Excitation Source Information for Language Independent Speaker Recognition, By Dipanjan Nandi, Debadatta Pati and K. Sreenivasa Rao, *16th International Oriental COCOSDA Conference (IEEE Explore)*, Gurgoan, India, (2013)
  40. Rock-Scissors-Paper Cycle of Cooperation Strategies in Opportunistic Mobile Networks, By S. Pal, S. Misra and B. K. Saha, *Proceedings of the IEEE International Conference on Communications (IEEE ICC13) – 3rd IEEE International Workshop on Smart Communication Protocols and Algorithms (SCPA 2013)*, Budapest, Hungary, (2013)
  41. Routing as a Bayesian Coalition Game in Smart Grid Neighborhood Area Networks: Learning Automata-Based Approach, By N. Kumar, S. Misra, M. S. Obaidat, *Proceedings of IEEE ICC 2014*, Sydney, Australia, (2014)
  42. Significance of Utterance Partitioning in GMM-SVM based Speaker Verification in Varying Background Environment, By Sourjya Sarkar and K. Sreenivasa Rao, *16th International Oriental COCOSDA Conference (IEEE Explore)*, Gurgoan, India, (2013)
  43. Spatio-Temporal Change Detection of Urban Heat Islands using Spatial Interpolation, By Shrutilipi Bhattacharjee, Titas Aikat, and Soumya K Ghosh, *5th International Conference on Pattern Recognition and Machine Intelligence (PREMI 2013)*, Springer LNCS 8251, Kolkata, India, (2013)
  44. Stochastic modeling of internal wave induced acoustic signal fluctuation and performance evaluation of shallow UWANs, By A. K. Mandal, S. Misra and M. Dash, *Proceedings of the IEEE International Conference on Communications (IEEE ICC13) – 3rd IEEE International Workshop on Smart Communication Protocols and Algorithms (SCPA 2013)*, Budapest, Hungary, (2013)

45. Toward Mining of Temporal Roles, *By* Barsha Mitra, Shamik Sural, Vijay Atluri and Jaideep Vaidya, *27th IFIP WG 11.3 Conference on Data and Applications Security and Privacy (DBSEC 2013)*, Newark, USA, (2013)
46. Web Services Based Attacks against Image CAPTCHAs, *By* David Lorenzi, Jaideep Vaidya, Shamik Sural and Vijay Atluri, *International Conference on Information Systems Security*, Kolkata, India, (2013)

## School of Medical Science & Technology

### **Head**

Prof. Pranab Kumar Dutta

### **Associate Professors**

Bhattacharya, Sangeeta Das	<i>MD (Johns Hopkins Univ.)</i> , Evidence Based Health Policy, Internal medicine and pediatrics, Vaccine preventable diseases in HIV infected children, Global Health, Development of College Mental Health Programs in the Indian Scenario
Chatterjee, Jyotirmoy	<i>Ph.D.</i> , Multimodal Medical Imaging-Analysis Regenerative Medicine Cancer Theranostics Natural Healing Agent
Chaudhury, Koel	<i>Ph.D.(Delhi)</i> , Women's Health, Oxidative stress and Infertility, Proteomics and Metabolomics for Biomarker Discovery and Understanding Disease Pathogenesis, Development of natural antioxidant nanoparticles
Das, Soumen	<i>Ph.D (IIT Kharagpur)</i> , Microsystem Technology, MEMS BIOMEMS and Microfluidic devices, Electro-physiological characterisation of biospecies, Medical electronics
Dhara, Santanu	<i>Ph.D.(IIT Kharagpur)</i> , Biomaterials and Regenerative Medicine: Fabrication Bioactivation Cell biology assay, Customized implant development, Bioactivation of Implant, Tissue Engineering, Near Net Shape Forming, Green machining, Medical Textile, 3D printing and Patterning, Dense and Porous Implants
Mandal, Mahitosh	<i>Ph.D.(Jadavpur Univ.)</i> , Cancer Biology, Signal Transduction, Apoptosis, Cell Cycle, Angiogenesis, Drug Delivery, Multi Drug Resistance, Cancer Stem Cell
Manjunatha M	<i>Ph.D. (IIT Madras)</i> , Bioinstrumentation & Biomedical Imaging, Functional Electrical Stimulation of Nerve and Muscle, Biosignal Processing, Neural Engineering and Retinal Prosthesis, Neurorehabilitation & Bio-Robotics
Mitra, Analava	<i>Ph.D.(IIT Kharagpur)</i> , Natural Products Research, Drug encapsulation, Clinical trials, Pharmacoepidemiology

### **Assistant Professor**

Chakraborty, Chandan	<i>Ph.D.(IIT Kharagpur)</i> , Biostatistics & Medical Informatics, Computer Vision & Pattern Recognition for Medical Imaging Informatics, Computational Pathology & Neuroinformatics, Statistical Machine Learning & Computer Aided Diagnosis (CAD)
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### **Faculty Appointments**

Santanu Dhara	Associate Professor
Chandan Chakraborty	Associate Professor
Sangeeta Das Bhattacharya	Associate Professor

### **Faculty Re-employment**

Prof. Sujay Guha	Professor on Re-employment
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### ***Brief Description of on-going activities***

• Development of micro-fluidic Biochips / Bio-MEMS for medical application. • Laser speckle imaging of blood-flow in microcirculation. • Development of statistical analyzer & disease pattern recognizer for Oral Pre-cancer and cancer. • Design of an intelligent diagnostic tool through the extraction of diagnostic rules for asthma. • Proteomics and reproductive health • Vaccine preventable diseases in HIV infected children • Integrated macro & micro-imaging on various healing & non-healing wounds including oral & breast precancer & cancer for their early characterization through image processing & analysis • Physico-chemical characterization of natural wound healing agents for the development of wound dressing technology. • Development of detailed database on respiratory rhythms for identifying their temporal & spatial characteristics in health & disease. • Development of biodegradable scaffold for tissue engineering and wound research. • In vitro screening of anti-diabetes molecules. • Design of a three dimensional scaffold and drug delivery system in arthritic hip joint. • Signal Transduction and cancer biomarker • Oxidative stress and Infertility • Development of natural antioxidant nanoparticles • Proteomics and Metabolomics in Reproductive Health • Nutraceuticals and Herbal medicine

### ***Thrust Areas***

1. -Medical Imaging & Image Processing - Medical Instrumentation - Bio-MEMS - Medical Statistics & Pattern Recognition - Medical Expert System - Tissue Engineering - Bio-Materials - Cancer Biology - Signal Transduction - Proteomics and reproductive health - .Diabetology and Herbal Medicine - Genetics & Molecular Profiling of Pre-cancer-Cancer & Wounds - Pediatrics HIV

### ***International Collaborations***

RIKEN, BSI Japan

### ***Lectures by Visiting Experts***

1. From Chromatin to Wiring *by* Prof. Adran Moore (RIKEN, BSI Japan)
2. New age surgery with pinhole techniques: from research lab to the hospital clini *by* Dr. Shuvro H. Roy-Choudhury (Fortis Hospital)
3. Astrocytic modulation of in vivo neural activity and sensory plasticity *by* Professor Hajime Hirase (RIKEN, BSI Japan)
4. Nuclear Medicie *by* Dr. Soumen Roy (Tata Medical Centre)

### ***Doctoral and MS Degrees Awarded***

1. Saralashrita Mohanty : reverse Engineering Approach towards Development of Customized Dental and Maxillofacial Prostheses(Ph.D.)
2. Raunak Kumar Das : Epithelial Molecular Attributes for Evaluating malignant Potentiality of Oral Sub-Mucous Fibrosis(Ph.D.)
3. Debdoot Sheet : Computational Modeling of Tissue Energy Interaction in Acoustic and Optical Imaging for in-situ Diagnostic Histopathology.(Ph.D.)
4. Madhumala Ghosh : Fuzzy Set Theoretic Approach to Microscopic Image Evaluatio of Chronic Myelogenous leukemia(Ph.D.)
5. Anup Sharma : Effect of Diluted and Agitated Cardiotropic Drug Digitalis purpurea on Heart Conduction: A study on Indian Bufo Melanostictus(Ph.D.)
6. Vikram Venkatraghavan : Fuzzy Uniformity Index for Texture analysis(MS)
7. Lopamudra Das : Multi-Modal Pathobiological Attributes in Augmenting Cervical cancer Diagnostics(Ph.D.)

8. Rangadhar Pradhan : In vitro Characterization of Cellular Behaviours using Miniaturized Sensing Devices(Ph.D.)
9. Saikat Kumar Jana : Effect of Oxidative Stress on the Pathogenesis and Endometrial Receptivity in women with Endometriosis and Therapeutic management using Duan Drug loaded Nanoparticles.(Ph.D.)
10. Prabir Sarkar : Content based Microscopic Image retrieval for Leukemia recognition from Peripheral Blood Smeras(MS)

***Member - Professional Bodies***

1. Chaudhury, Koel, *Life membership* - National Magnetic Resonance Society
2. Chaudhury, Koel, *Life Membership* - The Society for Free Radical Research-India (SFRR-India)
3. Chaudhury, Koel, *Life membership* - Indian Society of Andrology
4. Chaudhury, Koel, *Life membership* - Indian Society for the Study of Reproduction and Fertility (ISSRF)
5. Chaudhury, Koel, *Life membership* - Indian Society of Biomaterials
6. Bhattacharya, Sangeeta Das, *Regular* - American College of Physicians
7. Mandal, Mahitosh, *Associate Member* - American Society for Biochemistry and Molecular Biology
8. Mandal, Mahitosh, *Life Member* - Indian Association for Cancer Research
9. Mandal, Mahitosh, *Associate Member* - Indian Science Congress Association
10. Mandal, Mahitosh, *Life Member* - Physiological Society of India
11. Mandal, Mahitosh, *Associate Member* - American Association for Cancer Research
12. Chatterjee, Jyotirmoy, *Chairman* - Institutional Ethics Committee (IEC)
13. Chatterjee, Jyotirmoy, *Vice-President (Selected)* - IIndian Association of Cancer Research-WB Chapter
14. Chatterjee, Jyotirmoy, *Member of BoS* - Board of Studies (BoS), CHST,BESU,Shibpur
15. Chatterjee, Jyotirmoy, *Project Reviewer* - DST,Govt of India .
16. Manjunatha M, *Senior Member* - IEEE
17. Manjunatha M, *Life Member* - Bio-Medical Engineering Society of India
18. Manjunatha M, *Member* - The Institution of Engineers (India)
19. Manjunatha M, *Member* - International FES Society
20. Manjunatha M, *Senior Member* - IEEE-EMBS
21. Dhara, Santanu, *Member* - SBAOI
22. Dhara, Santanu, *Member (Annual)* - TERMIS
23. Dhara, Santanu, *Regular* - Society for Polymer Science, India
24. Dhara, Santanu, *Regular* - American Ceramics Society
25. Dhara, Santanu, *Member* - STERMI
26. Dhara, Santanu, *Regular* - Powder Matrix (UK)
27. Chakraborty, Chandan, *Regular Member* - European Society of Human Reproduction and Embryology (ESHRE)
28. Chakraborty, Chandan, *Chairman, Institutional Review Board* - Tata Medical Center, Kolkata
29. Chakraborty, Chandan, *Regular Member* - Association for Computing Machinery (ACM)
30. Chakraborty, Chandan, *Regular Member* - Institute of Electrical and Electronics Engineers (IEEE)
31. Chakraborty, Chandan, *Life Member* - Indian Society for Medical Statistics (ISMS)
32. Chakraborty, Chandan, *Life Member* - Indian Science Congress Association (ISCA)
33. Mitra, Analava, *Life Member* - Indian Medical Association
34. Mitra, Analava, *Life Member* - IMA College of General practitioners
35. Mitra, Analava, *Member* - National Association of Psychologists
36. Mitra, Analava, *Member* - Centre of Applied Medicine Kathmandu-Nepal
37. Mitra, Analava, *Member* - Society for Advanced studies in Medicine and surgery
38. Das, Soumen, *Member* - IEEE

### ***Member - Editorial Board***

1. Chakraborty, Chandan (2012) *Editorial Board Member* - Research & Reviews : Journal of Medical Imaging and Technology
2. Chakraborty, Chandan (2012) *Member, International Editorial Board* - Artificial Intelligence Research (Canada)
3. Chakraborty, Chandan (2012) *Editorial Board Member* - International Journal of BioSciences and Technology
4. Chaudhury, Koel (2013) *Member, Editorial Board* - Journal of Medical & surgical Urology
5. Chaudhury, Koel (2013) *Member, Editorial Board* - World Journal of Translational Medicine
6. Dhara, Santanu (2013) *Member* - Indian Journal of Materials Science
7. Manjunatha M (2013) *Reviewer* - IEEE Transactions on Biomedical Engineering
8. Manjunatha M (2012) *Reviewer* - Journal of Medical Devices
9. Manjunatha M (2012) *Editor* - American Journal of Biomedical Research
10. Mitra, Analava (2011) *Member* - Agricultural Science Research Journal
11. Mitra, Analava (2009) *Member Editorial Board* - International Journal of Pharmaceutical Drugs, Sciences and Technology (IJPDSST)
12. Mitra, Analava (2011) *Member* - Indian Journal of Pharmacology
13. Mitra, Analava (2011) *Member* - Journal of Clinical and Diagnostic Research
14. Mitra, Analava (2013) *Member* - Biomaterials
15. Mitra, Analava (2014) *Member* - journal of drug delivery
16. Mitra, Analava (2011) *Member* - Pharmaceutics & Novel Drug Delivery Systems : Current Research.
17. Mitra, Analava (2011) *Member* - Pharmaceutical biology
18. Mitra, Analava (2012) *Member* - African journal of microbiology research
19. Mitra, Analava (2011) *Member of Editorial Board* - African Journal of Agricultural Research
20. Mitra, Analava (0) *Member* - World Journal of diabetes
21. Mitra, Analava (2007) *Member Editorial Board* - Anthropology Today: Trends, Scope And Applications, Published by
22. Mitra, Analava (2011) *Member* - African Journal of Food Science

### ***Awards & Honours***

1. Mandal, Mahitosh (2013) *Best Poster Award at Indian Association of Cancer Research Meeting at Delhi,*
2. Chakraborty, Chandan (2013) *DAE-Young Scientist Research Award from Dept of Atomic Energy, Govt. of India*
3. Chakraborty, Chandan (2012) *IBM Faculty Award, New York, USA*
4. Chakraborty, Chandan (2012) *IBM-Shared University Research Award*
5. Chakraborty, Chandan (2013) *IBM-Shared University Research Award*
6. Mitra, Analava (2012) *Rastriya Gaurav Award*
7. Mandal, Mahitosh (2012) *Sm Subha Mukherjee Memorial Award by the Physiological Society of India*

### ***Sponsored Research Projects***

1. Assessment of endometrial receptivity and its correlation with sub endometrial blood flow (SEBF) in women with latent genital tuberculosis (ICMR, Rs.30.86 Lakhs)
2. Centre of excellence for training and research in microfluidics (IIT Kharagpur, Rs.251.00 Lakhs)
3. Characterization and Grading of Brain Gliomas using MR images – A Computer Vision Approach (DAE-Young Scientist Research Award, Dept. of Atomic Energy, Govt. of India, Rs.13.30 Lakhs)

4. Computer-Aided Fundus image analyzer for Diabetic Retinopathy Screening (DBT, Govt of India, Rs.20.66 Lakhs)
5. Design & Feasibility Study of Versatile Low-cost Functional Electrical Stimulator (FES) for Hemiplegics (National Institute for the Orthopaedically Handicapped (Min. of Social Justice & Empowerment,GOI), Rs.16.50 Lakhs)
6. Development & realisation of silicon tunneling accelerometer (ISRO, Rs.35.00 Lakhs)
7. Development of a Statistical Analyzer based Computer Aided Diagnostic (CAD) System for Asthma (DST, Govt of India, Rs.13.00 Lakhs)
8. Development of biodegradable polymer encapsulated besifloxacin nanoparticles: a novel therapeutic approach for endophthalmitis (Netra Jyoti Seva Mandiram Veerayatan, Nalanda, Rajgir., Rs.7.56 Lakhs)
9. Development of Ceramics Based Bioactive Scaffold Through Bone Tissue Engineering (BSH) (CSIR, Rs.17.00 Lakhs)
10. Development of Dense and Porous Titanium Components via Powder Metallurgy Route for Biomedical Applications (DRDO, Rs.67.83 Lakhs)
11. Development of Pattern Recognition Algorithms for Quantitative Characterization of Ovarian Ultrasound and Doppler images (WBDST, Rs.9.00 Lakhs)
12. Dielectric separation of biological cells in microfluidic channel (NPMASS, Govt. of India, Rs.10.80 Lakhs)
13. Early prediction of gestational hypertension (Pregnancy induced hypertension): A proteomics approach (Department of Biotechnology, Rs.22.38 Lakhs)
14. Engineered Silk Matrices for optimization of in vitro 3D Tumour Model (Indian Council of Medical Research, Rs.49.00 Lakhs)
15. Enhanced production, purification and characterization of marine bacterial lipopeptide as potential broad spectrum antimicrobial and anti cancer agent (Ministry of Earth Science, India, Rs.100.03 Lakhs)
16. Haptic Torch for Mobility of Visually Impaired and Blind People (SRIC, IIT KHARAGPUR,Sponsored Research & Industrial Consultancy, IIT Kharagpur, Rs.1.00 Lakhs)
17. Identification of potential biomarkers for the diagnosis of endometriosis: a proteomics approach (DST, Rs.25.20 Lakhs)
18. Improving Breast Cancer diagnosis and prognostication: Automated Multimodality Image Analytics to develop easily accessible quick throughput solutions (MHRD, Govt. of India, Rs.54.50 Lakhs)
19. Indian Origin Silk based biomimetic scaffolds for engineering of load bearing tissue (Dept of Biotechnology, India., Rs.34.13 Lakhs)
20. Integrated Application of Multimodal Optical Coherence Tomography and Multispectral Imaging for Spatio - functional Characterization of Skin Towards i (IIT,Kharagpur (Announced on 08.03.2014), Rs.25.00 Lakhs)
21. Involvement of functional single nucleotide polymorphisms (SNP) of matrix metalloproteinase (MMP) gene promoters in the cell type specific regulation (DBT, Rs.52.00 Lakhs)
22. Metabolomics study of women with polycystic ovary syndrome (PCOS): A system biology approach (Department of Biotechnology, Rs.25.99 Lakhs)
23. Metabonomics study of Primary Open Angle Glaucoma (POAG) to understand underlying disease mechanism and hence development of new treatment strategies (Purnima Netralaya, Jamshedpur, Rs.12.00 Lakhs)
24. Pilot Program for Nutritional Intervention Amongst Primary School Children at Kashijora (IIT KGP, Rs.1.00 Lakhs)
25. Prevention of Pneumonia in Children with HIV infection (ICMR, Rs.55.00 Lakhs)
26. Role of long-term doxycycline as matrix metalloproteinase (MMP-2 and MMP-9) inhibitor in chronic obstructive pulmonary disease (COPD) (WB DST, Rs.4.65 Lakhs)
27. Sequence Dependent Molecular Action of ZD6474 with Paclitaxel and Radiation in Progress and Treatment of Breast Cancer (PRB) (DBT, India, Rs.35.00 Lakhs)

28. Structural & Molecular Characterization of Cutaneous Cells Behavior under Varied Physico-chemical Ambience towards Improving Skin Tissue Engg. (CCB) (SERB DST, Rs.51.65 Lakhs)
29. Test marketing of cotton lap/ cellulose pad substitute from jute (National Jute Board, Rs.19.20 Lakhs)
30. Therapeutic efficacy and bioavailability of various polyphenolics present in tea as an adjuvant in the treatment of Alzheimer's Disease (NTRF, Rs.22.78 Lakhs)
31. To Evaluate the Clinical Efficacy of the Functional electrical Stimulation (FES) therapy in Stroke Survivors (Indian Council of Medical Research, Rs.20.00 Lakhs)

***Patents (filed / granted)***

1. A novel mask, designed to prevent dust particle-derived occupational hazard like pneumoconiosis, by a unique dual approach mechanism□?
2. A process for fabrication of customized ceramic products by CNC machining of green ceramics compacts using diamond impregnated tool' by S. Mohanty, S. Dhara
3. A process for Production of Collagen and By-Products from Fresh Water Fish Origin and Applications Thereof
4. Adaptive weighted local difference order statistics filter (US Patent application )
5. Anti Bacterial Hydrogel Composition and Application Thereof
6. Biodegradable polymer encapsulated Besifloxacin nanoparticles.
7. CHARGE BALANCED SELF ADJUSTING ELECTRICAL STIMULATOR FOR CORRECTING FOOT DROP PROBLEM
8. Development of a sustained intestinal release o/w/o andrographolide emulsion for better organoleptic and therapeutic efficacy.
9. Digital Microscopy Equipment With Image Acquisition, Image Analysis and Image Communication
10. Formulation of a nutraceutical butter for treating psoriasis & eczema
11. iMEdiX to A multi-tier secure modular system for telemedicine and e-healthcare
12. In situ iodination with amine/hydroxyl derivatives for non-invasive imaging and other applications thereof
13. Method and apparatus for enhancing representations of microcalcifications in a digital mammogram image
14. Method and System for Analyzing Breast Carcinoma using Microscopic Image Analysis of Fine Needle Aspirates
15. Method and system for characterizing tissues in optical coherence tomography(Indian patent application)
16. Method and System for Detection of Oral Sub-Mucous Fibrosis using Microscopic Image Analysis of Oral Biopsy Samples
17. VENUCAINE: An Electronic Travel Aid for Visually Impaired Blind People

**Visits Abroad by Faculty Members**

1. Manjunatha M - For attending/presenting a paper at the 11th Vienna International Workshop on FES (Congress in Graz and a visit to TU Graz, Austria, ) September 19-21, 2013
2. Dhara, Santanu - Presenting our work (Wu-Zhen, Sanghai, China, ) 6 days
3. Manjunatha M - Taiwan-India Symposium on Medical Device Innovation (National Cheng Kung University, Tainan, TAIWAN, ) 9-10 Dec 2013
4. Mandal, Mahitosh - Collaborative Research Work (Virginia Commonwealth University, Richmond, USA, ) Mid May,2013- 30th June,2013
5. Mandal, Mahitosh - Conference (San Antonio, TX, USA, ) 10/12/2013 to 14/12/2013
6. Mandal, Mahitosh - Collaborative Research Work (M D Anderson Cancer Center, Houston, TX,USA, )



### **Invited Lectures by Faculty Members**

1. pH-responsive gold niosome-mediated co-delivery of siRNA and thymoquinone induces Akt knockdown in t *by* Mandal, Mahitosh (KIIT, Bhubhaneswar)
2. MEMS for space application *by* Das, Soumen (MEMS and Sensors at NIT Silchar)
3. Mobile Diagnostics - MEMS Perspective *by* Das, Soumen (College of Engineering and management, Kolkaghat)
4. Microfabrication process and BioMEMS *by* Das, Soumen (IEEE Workshop on MEMS, Microfluidics & Microsystems With Hands-on training in Device Simulation and Microfabrication Process, at IIT Kharagpur)
5. Cell manipulation in microfluidic environment by exploiting their electrical properties *by* Das, Soumen (Jadavpur University)
6. Biomaterials *by* Dhara, Santanu (Materials Science IITKGP workshop)
7. Biomimetic Design and Fabrication for Tissue Engineering *by* Dhara, Santanu (NIT Silchar)
8. Fabrication aspects for Rehabilitation *by* Dhara, Santanu (Kolaghat Engineering College)
9. Wound Management *by* Dhara, Santanu (National Burn Centre, Mumbai)
10. Reverse Engineering Approach for Customized Fabrication of Implants *by* Dhara, Santanu (NIT Durgapur)
11. Tissue Engineering Strategy and Benefits *by* Dhara, Santanu (BESU)
12. In the opinion of the house – ‘Letrozole should be banned for use in ovulation induct *by* Chaudhury, Koel (ART-AIM UPDATE 2013, Kolkata)
13. Advancement in Biomedical Science & Technology *by* Manjunatha M (Tata Medical Center, Kolkata)
14. Advances in Neuro-rehabilitation devices in stroke *by* Manjunatha M (National Cheng Kung University, Tainan, TAIWAN)
15. Software development for diabetic retinopathy screening *by* Chakraborty, Chandan (Pune, India)
16. Medical Imaging Informatics Approach for Disease Screening *by* Chakraborty, Chandan (NIT Durgapur)
17. Multimodal and Multi-Scale Imaging for Cancer & Regeneration Research *by* Chatterjee, Jyotirmoy (International Seminar on Technological Advances in Healthcare (TAH-2013), BESU, Shibpur)
18. Multi-modal developmental model in CSR-ECL mode *by* Mitra, Analava (ECL)
19. INTRODUCING BRAIN PLASTICITY AND NEURO-MODULATION : IN VIVO AND IN VITRO TECHNIQUES *by* Manjunatha M (Ravenshaw University, Cuttack)
20. Functional Electrical Stimulation & Neuro-Prosthesis in SCI Rehabilitation *by* Manjunatha M (National Conference on Spinal Cord Injury, Organised by NIOH-Kolkata & MSJE, GOI, New Delhi at SCOPE COMPLEX-NEW DELHI-)
21. FES in stroke and CP Rehabilitation: A Clinical Study *by* Manjunatha M (Indo-British Neurosciences Symposium at Institute of neurosciences Kolkata)
22. Improvement of gait and muscle strength with FES in sub-acute & chronic stroke patients *by* Manjunatha M (MANIPAL UNIVERSITY)
23. Thymoquinone synergistically enhances the efficacy of tamoxifen/diosgenin by inhibiting Akt mediated *by* Mandal, Mahitosh (Indian Association for Cancer Research)
24. Vaccine access in high risk children perspectives from pediatric HIV management West Bengal *by* Bhattacharya, Sangeeta Das (Christiana Health Systems, Newark Delaware)

### **Books Published**

1. Analava Mitra and Baishakhi Dey: Public Health, Diseases, Preventive strategies-A Multidisciplinary Approach *published by* Bhalani Medical Publishers, ISBN: 978 93 81496 18 3 (2012)

### ***Papers Published in Journals***

1. Chemo-profiling of eucalyptus and study of its hypoglycemic potential By Baishakhi Dey, Analava Mitra *World Journal of Diabetes* 4(5):170-176 (2013)
2. Exploration of natural enzyme inhibitors with hypoglycemic potentials amongst Eucalyptus Spp. by in vitro assays By Baishakhi Dey, Analava Mitra, Prakash Katakam, Rajeev K Singla *World Journal of Diabetes* Accepted (2014)
3. In vivo-In vitro studies of the quantitative effect of calcium, multivitamins, milk on single dose ciprofloxacin bioavailability By Baishakhi Dey, Prakash Katakam, Fathi H Assaleh, Babu Rao Chandu, Shanta K Adiki, Analava Mitra *Journal of Pharmaceutical Analysis* Accepted (2014)
4. Pharmaco-epidemiological Studies on Self Medication and Drug Utilization Pattern in Chronic Diseases via Prescription Auditing By Baishakhi Dey, Nagiat T. Hwisa, Abdurraouf MM. Khalf, Analava Mitra, Prakash Katakam, Chandu Babu Rao *International journal of scientific research in knowledge* 1(11):464-471 (2013)
5. Computational analysis of p63 + nuclei distribution pattern by graph theoretic approach in an oral pre-cancer (sub-mucous fibrosis). By Bag S, Conjeti S, Das RK, Pal M, Anura A, Paul RR, Ray AK, Sengupta S, Chatterjee J *Journal of Pathology Informatics* 4:35 (2013)
6. Dextrin cross linked with poly(HEMA): A novel hydrogel for colon specific delivery of ornidazole By Das, D., Das, R., Ghosh, P., Dhara, S., Panda, A.B., Pal, S. *RSC Advances* 3 (47), 25340-25350 (2013)
7. In vitro evaluation of osteoconductivity and cellular response of zirconia and alumina based ceramics By Pandey, A.K., Pati, F., Mandal, D., Dhara, S., Biswas, K. *Materials Science and Engineering C* 33 (7), 3923-393 (2013)
8. 1H NMR based targeted metabolite profiling for understanding the complex relationship connecting oxidative stress with endometriosis By Jana SK, Dutta M, Joshi M, Srivastava S, Chakravarty B, Chaudhury K. *BioMed Research International* 2013:329058. (2013)
9. A combined artificial neural network modeling-particle swarm optimization strategy for improved production of marine bacterial lipopeptide from food waste By Dhanarajan, G., Mandal, M., Sen, R *Biochemical Engineering Journal* 84, 59-65 (2014)
10. A framework for web based geographical information systems for country wide antimicrobial resistance monitoring By Arya B, Robert D, Bhattacharya S, Mukhopadhyay *Health Policy and Technology* 2013(2) (2013)
11. A microfluidic device for continuous manipulation of biological cells using dielectrophoresis By D. Das, K. Biswas and S. Das *J. of Medical Engineering & Physics* doi.org/10 (2013) (2013)
12. Altered circulating levels of matrix metalloproteinases 2 and 9 and their inhibitors and effect of progesterone supplementation in women with endometriosis undergoing in vitro fertilization By Singh, A.K., Chattopadhyay, R., Chakravarty, B., Chaudhury, K. *Fertility and Sterility* 100(1):127-34 (2013)
13. Altered metabolic profile in early and late onset preeclampsia: An FTIR spectroscopic study By Mukherjee, R., Ray, C.D., Ray, S., Dasgupta, S., Chaudhury, K. *Pregnancy Hypertension* Vol 4, Pg 70–80 (2014)
14. An emerging interface between life science and nanotechnology: present status and prospects of reproductive healthcare aided by nano-biotechnology By Jha RK, Jha PK, Chaudhury K, Rana SV, Guha SK *Nano Reviews* 5: 22762 (2014)
15. An EMG-control functional electrical stimulation (FES) system for restoration of gait in foot drop patients By Sukanta Kumar Sabut, Manjunatha Mahadevappa *International Journal of Biomedical Engineering and Technology* Accepted (2013)
16. An Experimental Design Approach for impurity profiling of Valacyclovir related products by RP-HPLC By Prakash Katakam, Baishakhi Dey, Nagiat T. Hwisa, Fathi H. Assaleh, Babu R. Chandu, Rajeev K. Singla, Analava Mitra *Scientia Pharmaceutica* Communicated (2014)
17. Analysis of plasma induced morphological changes in sputtered thin films over complaint elastomer By D. Maji and S. Das, *J. of Physics D: Applied Physics* vol. 47, pp.105401 (2014)

18. Assessing Cytotoxic Effect of ZD6474 on MDA-MB-468 Cells Using Cell Based Sensor By R. Pradhan, M. Mandal, A. Mitra, S. Das *IEEE Sensor Journal* (2014)
19. Assessment of molecular events during in vitro re-epithelialization under honey-alginate matrix ambience By A Barui, N. Mandal, S. Majumder, R. K. Das, S. Sengupta, P. Banerjee, A. Kr. Ray, C. Roy Chaudhuri, J. Chatterjee *Materials Science and Engineering: C* 33(6):3418–3425 (2013)
20. Assessment of vascular health using photoplethysmograph and a Two-Pulse synthesis model for patients under hemodialysis with End Stage Renal Disease By Goswami, D., Mukhopadhyay, J., Chaudhury, K. *2013 Indian Conference on Medical Informatics and Telemedicine (ICMIT)* 68-72 (2013)
21. Autophagy: cancers friend or foe? By 9. Bhutia SK, Mukhopadhyay S, Sinha N, Das DN, Panda PK, Patra SK, Maiti TK, Mandal M, Dent P, Wang XY, Das SK, Sarkar D, Fisher PB *Adv Cancer Res* 118:61-95 (2013)
22. “Monitoring Cellular Activities of Cancer cells Using Impedance Sensing Devices By R. Pradhan, M. Mandal, A. Mitra, S. Das *Sensor and Actuators, B: Chemical* vol. 193 pp. 478-483 (2014)
23. Beneficial Effects of Terminalia chebula in Common Blood Biochemistry By MUKHERJEE S., MITRA A., BHATTACHARJEE N., BHATTACHARJEE R. *IJPRD* (2014)
24. Biofunctional phosphorylated chitosan hydrogels prepared above pH 6 and effect of crosslinkers on gel properties towards biomedical applications By Datta, P., Thakur, G., Chatterjee, J., Dhara, S. *Soft Materials* 12 (1), 27-35 (2014)
25. Celecoxib alleviates tamoxifen-instigated angiogenic effects by ROS-dependent VEGF/VEGFR2 autocrine signaling By 10. Kumar BN, Rajput S, Dey KK, Parekh A, Das S, Mazumdar A, Mandal M *BMC Cancer* 13:273 (2013)
26. Chitosan-collagen scaffolds with nano/microfibrous architecture for skin tissue engineering By Sarkar, S.D., Farrugia, B.L., Dargaville, T.R., Dhara, S. *Journal of Biomedical Materials Research - Part A* 101 (12), 3482-3492 (2013)
27. Comparative evaluation of hypoglycemic potential of leaf extracts of eucalyptus spp. and their entrapment into microcapsules for controlled delivery By Baishakhi Dey, Prakash Katakam, Analava Mitra, Babu Rao Chandu *Journal of Drug Delivery and Research* Communicated (2014)
28. Critical issues in near net shape forming via green machining of ceramics: A case study of alumina dental crown By Saralashrita Mohanty, Arun Prabhu Rameshbabu, Shyamal Mandal, Bo Su, Santanu Dhara *Journal of Asian Ceramic Societies* 1(3)274-281 (2013)
29. Design and development of a PDMS membrane based SU-8 micropump for drug delivery system By B. Pramanick, P.K. Dey, S. Das and T.K. Bhattacharyya *Journal of ISSS* vol. 2, pp. 1-9 (2013)
30. Design, Development and Clinical Evaluation of the Electronic Mobility Cane for Vision Rehabilitation By S Bhatlawande, M Mahadevappa, J Mukherjee, M Biswas, D Das and S Gupta *IEEE Transactions on Neural Systems & Rehabilitation Engineering* Accepted (2014)
31. Effect of Mangiferin and Mahanimbine on Glucose Utilization in 3T3-L1 cells By 12. Kumar BD, Krishnakumar K, Jaganathan SK, Mandal M *Pharmacogn Mag* 9(33):72-5 (2013)
32. Effect of total calorie consumed in breakfast, lunch, evening snacks and dinner in blood biochemistry profiles of Diabetics By Sutapa Mukherjee, Baishakhi Dey, Subhayan Das, Satyahari Dey, Analava Mitra *Food Science and Technology* 2(2), 15-19 (2014)
33. Effectiveness of Care Pathways in Ideal Hospital Management System: A Review By Baishakhi Dey, Anindya Mitra, Katakam Prakash, Amrita Basu, Supriya Ray, Analava Mitra *Indo Global Journal of Pharmaceutical Sciences* 3(3): 185-191 (2014)
34. Effects of increased protein intake as a variant of rural diet in human volunteers of rural Bengal By Sutapa Mukherjee, Baishakhi Dey, Subhayan Das, Goutam Thakur, Chandan Chakraborty, Analava Mitra *JMED Research* in Press (2014)
35. Electric cell-substrate impedance sensing technique to monitor cellular behaviours of cancer cells By R. Pradhan, S. Rajput, M. Mandal, A. Mitra, S. Das *RSC Advances* (2014)

36. Electric cell-substrate impedance sensing technique to monitor cellular behaviours of cancer cells By Pradhan, R. , Rajput, S., Mandal, M., Mitra, A., Das S *RSC Advances* 4(19) 9432-38 (2014)
37. Electro-Thermal Analysis of embedded boron diffused microheater for thruster application By P. Kundu, T. K. Bhattacharyya and S. Das *Microsystem Technologies, Springer* vol.20, pp.23-33 (2014)
38. Electronic Bracelet and Vision Enabled Waist-belt for Mobility of Visually Impaired People By Shripad Bhatlawande, Amar Sunkari, \*Manjunatha Mahadevappa, JayantaMukhopadhyay,Mukul Biswas, Debabrata Das and Somedeb Gupta *Assistive Technology* Accepted (2014)
39. Endometrial receptivity markers in infertile women stimulated with letrozole compared with clomiphene citrate and natural cycles. By Ganesh A, Chauhan N, Das S, Chakravarty B, Chaudhury K. *Systems Biology in Reproductive Medicine* 60(2):105-11. (2014)
40. Epithelio-mesenchymal transitional attributes in oral sub-mucous fibrosis By RK Das, A Anura, S Bag, M Pal, S Mazumdar, A Barui, AK Ray,C Chakraborty, RR Paul, S Sengupta J Chatterjee *Experimental and Molecular Pathology* 95(3): 259-269 (2013)
41. Evaluation of Blood Glucose Concentration Using Impedance Sensing Devices By R. Pradhan, A. Mitra, S. Das, *Journal of Electrical Bioimpedance* vol. 4 pp. 73-77 (2013)
42. Evaluation of Single cell electrical parameters from bioimpedance of cells suspension By D. Das, F.A. Kamil, K. Biswas and S. Das, *RSC advances* DOI: 10.1039/C4RA004 (2014)
43. Events associated with apoptotic effect of p-Coumaric acid in HCT-15 colon cancer cells. By Jaganathan SK, Supriyanto E, Mandal M *World J Gastroenterol* 2119(43):7726-34 (2013)
44. Finding an optimum immuno-histochemical feature set to distinguish benign phyllodes from fibroadenoma By Maity, P.P., Chatterjee, S., Das, R.K., Mukhopadhyay, S., Maity, A., Maulik, D., Ray, A.K., Dhara, S., Chatterjee, J. *Micron* 48, pp. 34-41. (2013)
45. Fragmental frequency analysis method to estimate electrical cell parameters from bioimpedance study By D. Das, F.A. Kamil, S. Agrawal, K. Biswas, and S. Das *IEEE Trans. on Instrumentation and Measurement* DOI No. 10.1109/TIM. (2013)
46. Frequency Dependant Impedimetric Cytotoxic Evaluation of Anticancer Drug on Breast Cancer Cell, By R. Pradhan, S. Rajput, M. Mandal, A. Mitra, S. Das *Biosensors and Bioelectronics*. vol. 55 pp. 44-50, (2014)
47. Frequency dependant impedimetric cytotoxic evaluation of anticancer drug on breast cancer cell By R. Pradhan, S. Rajput, M. Mandal, A. Mitra and S. Das *Biosensors and Bioelectronics* 55, pp.44-50 (2014)
48. Functional Electrical Stimulation on Improving Foot Drop Gait in Poststroke Rehabilitation: A Review of its Technology and Clinical Efficacy By S. K. Sabut, S. D. Bhattacharya, & M. Manjunatha *Critical Reviews™ in Biomedical Engineering* 41(2):149–160 (2013)
49. Gaps in health infrastructure in Indian scenario: A review By Baishakhi Dey, Anindya Mitra, Katakam Prakash, Amrita Basu, Supriya Ray, Analava Mitra *Indo Global journal of Pharmaceutical Sciences* 3(2), 154-164 (2013)
50. HOXA-11 mediated dysregulation of matrix remodeling during implantation window in women with endometriosis By Jana, S.K., Banerjee, P., Mukherjee, R., Chakravarty, B., Chaudhury, K. *Journal of Assisted Reproduction and Genetics* 30(11):1505-12 (2013)
51. Hunting for necrosis in the shadows of intravascular ultrasound By Debdoot Sheeta, c, Corresponding author contact information, E-mail the corresponding author, E-mail the correspond Sheet, A Karamalis, A Eslamia, P Noël, R Virmani, M Nakano, J Chatterjee, AK. Ray, Andrew F. L, S G. Carlierf, N Navab,A Katouzian *Computerized Medical Imaging and Graphics* 38( 2) :104-112 (2014)
52. Identification of key contributory factors responsible for vascular dysfunction in idiopathic recurrent spontaneous miscarriage By Banerjee P, Ghosh S, Dutta M, Subramani E, Khalpada J, Roychoudhury S, Chakravarty B, Chaudhury K. *PLoS ONE* 8(11):e80940 (2013)
53. Improvement of cellular uptake, in vitro antitumor activity and sustained release profile with increased bioavailability from a nanoemulsion platform By 6. Choudhury H, Gorain B,

- Karmakar S, Biswas E, Dey G, Barik R, Mandal M, Pal TK *Int J Pharm* 2460(1-2):131-43 (2013)
54. In situ histology of mice skin through transfer learning of tissue energy interaction in optical coherence tomography By D Sheet A Chaudhary SPK Karri D Das A Katouzian PBanerjee N Navab J Chatterjee A K. Ray *Journal of Biomedical Optics* 18(9):090503(1-3) (2013)
  55. In vitro ALP and osteocalcin gene expression analysis and in vivo biocompatibility of n-methylene phosphonic chitosan nanofibers for bone regeneration By Datta, P., Ghosh, P., Ghosh, K., Maity, P., Samanta, S.K., Ghosh, S.K., Mohapatra, P.K.D., Chatterjee, J., Dhara, S. *Journal of Biomedical Nanotechnology* 9 (5), pp. 870-879. (2013)
  56. Interference-aware MAC scheduling and admission control for multiple mobile WBANs used in healthcare monitoring By J. Mahapatro, S. Misra, M. Mahadevappa, and N. Islam *International Journal of Communication Systems* Available Online (2014)
  57. Joint learning of ultrasonic backscattering statistical physics and signal confidence primal for characterizing atherosclerotic plaques using intravascular ultrasound By D Sheet, A Karamalis, A Eslami, PB Noel, J Chatterjee, AK Ray, AF Lane, SG Carlier, N Navab, A Katouzian *Medical Image Analysis* 18(1):103-117 (2014)
  58. Letrozole and Curcumin Loaded-PLGA Nanoparticles: A Therapeutic Strategy for Endometriosis By Jana SK, Chakravarty B, Chaudhury K *Journal of Nanomedicine & Biotherapeutic Discovery* 4:1 (2014)
  59. Letrozole dispersed on poly (vinyl alcohol) anchored maleic anhydride grafted low density polyethylene: A controlled drug delivery system for treatment of breast cancer. By Siddiqua AJ, Chaudhury K, Adhikari B *Colloids and Surfaces B: Biointerfaces* 116C:169-175 (2013)
  60. Markers of oxidative stress in follicular fluid of women with endometriosis and tubal infertility undergoing IVF. By Singh, A.K., Chattopadhyay, R., Chakravarty, B., Chaudhury, K. *Reproductive Toxicology* Vol 42, Pg 116-124 (2013)
  61. MEMS based normally closed silicon microregulator for gas and water By B. Pramanick, S. Das and T.K. Bhattacharyya *Sensors & Actuators: A. Physical* vol.205, pp. 15-25 (2014)
  62. Modelling a BCI system to estimate FES stimulation intensity for individual stroke survivors in foot drop cases By M. Mahadevappa C. Shendkar P. Lenka A. Biswas R. Kumar *Biomed Tech- Biomedical Engineering/Biomedizinische Technik.(Berlin)* © 2013 ISSN (Online) 1862-278X 58 (Suppl. 1) (2013)
  63. Molecular targeting of Akt by thymoquinone promotes G(1) arrest through translation inhibition of cyclin D1 and induces apoptosis in breast cancer cells By 8. Rajput S, Kumar BN, Dey KK, Pal I, Parekh A, Mandal M *Life Sci* 1393(21):783-90 (2013)
  64. Monitoring cellular activities of cancer cells using impedance sensing devices By Pradhan, R., Mandal, M., Mitra, A., Das S *Sensors and Actuators, B: Chemical*. 193: 478- 483 (2014)
  65. Monopolar impedance sensing microdevices for characterization of cells and tissue culture By R. Pradhan, L. Das, J. Chatterjee, M. Mandal, A. Mitra and S. Das *Sensor Letters* vol.11, No.3, pp.466 (2013)
  66. Net shape forming of green alumina via CNC machining using diamond embedded tool By Mohanty, S., Rameshbabu, A.P., Dhara, S. *Ceramics International* 39 (8), 8985-8993 (2013)
  67. Osteoblastic cellular responses on ionically crosslinked chitosan-tripolyphosphate fibrous 3-D mesh scaffolds By Pati, F., Kalita, H., Adhikari, B., Dhara, S. *Journal of Biomedical Materials Research - Part A* 101 A (9), 2526-2537 (2013)
  68. Phosphate functionalized and lactic acid containing graft copolymer: Synthesis and evaluation as biomaterial for bone tissue engineering applications By Datta, P., Chatterjee, J., Dhara, S. *Journal of Biomaterials Science, Polymer Edition* 24 (6), pp. 696-713 (2013)
  69. Photoresponsive coumarin-tethered multifunctional magnetic nanoparticles for release of anticancer drug By 11. Karthik S, Puvvada N, Kumar BN, Rajput S, Pathak A, Mandal M, Singh ND. *ACS Appl Mater Interfaces* 125(11):5232-8. (2013)
  70. Poly (maleic acid)–A novel dispersant for aqueous alumina slurry By S Mohanty, B Das, S Dhara *Journal of Asian Ceramic Societies* 1 (2), 184-190 (2013)

71. Quantitative evaluation of blood glucose concentration using impedance sensing devices *By* R. Pradhan, A. Mitra, S. Das, *Journal of Electrical Bioimpedance* (2014)
72. Random Room Mobility Model and Extra-Wireless Body Area Network Communication in Hospital Buildings *By* J. Mahapatro, S. Misra, M. Mahadevappa, and N. Islam *IET Networks* doi: 10.1049/iet-net (2014)
73. Recurrent implantation success in consecutive embryo transfer cycles: A unique case report *By* Ghosh S, Chattopadhyay R, Goswami S, Ganesh A, Chaudhury K, Chakravarty B. *Systems Biology in Reproductive Medicine* 59(5):285-6 (2013)
74. Risk Factors for Incomplete Immunizations in HIV infected Children *By* SD, Bhattacharya S, Chatterjee D, Niyogi SK, Chauhan N, Sudar A *Indian Journal of Pediatrics* May 3 (2013)
75. Role of 3D printing technologies in combating biomedical and drug delivery challenges *By* Prakash Katakam, Baishakhi Dey, Fathi H Assaleh, Shanta Kumari Adiki, Babu Rao Chandu, Analava Mitra *Critical Reviews in Therapeutic Drug Carrier System* Accepted (2014)
76. Rotational dynamics of optically trapped human spermatozoa. *By* Subramani E, Basu H, Thangaraju S, Dandekar S, Mathur D, Chaudhury K *The Scientific World Journal* 2014: 154367 (2014)
77. Simulation and feasibility study of flow sensor on flexible polymer for healthcare application *By* D. Maji and S. Das *IEEE Trans. Biomedical Engg* vol. 60, No. 12, (2013)
78. Single Step Sintered Calcium Phosphate Fibers from Avian Egg Shell *By* P Dadheech, B Das, S Dhara *Int. J. Mod. Phys. Conf. Ser.* 22, 305-12 (2013)
79. Targeted apoptotic effects of thymoquinone and tamoxifen on XIAP mediated Akt regulation in breast cancer *By* 13. Rajput S, Kumar BNP, Sarkar D, Das S, Azab B, Santhekadur PK, Das SK, Emdad L, Sarkar D, Fisher PB, Mandal M *PLoS ONE* 8 (4) art. no. e 613 (2013)
80. Targeted therapy against EGFR and VEGFR using ZD6474 enhances the therapeutic potential of UV-B phototherapy in breast cancer cells *By* Sarkar S, Rajput S, Tripathi AK, Mandal M *Mol Cancer* 2012(1):122. (2013)
81. The Buckling of Metal Thin Films on Soft Elastomers: Use in Flexible Electronics *By* Debashis Maji, Puneet Manocha and Soumen Das *Journal of ISSS* vol.2, pp.10-17 (2013)

### ***Papers Presented in Conferences***

1. <sup>1</sup>H NMR based metabolite profiling for understanding the complex relationship connecting oxidative stress with endometriosis., *By* K. Chaudhury, S. K. Jana, M. Dutta, M. Joshi, S. Srivastava, B. Chakravarty., *69th Annual Meeting of American Society of Reproductive Medicine*, Boston, (2013)
2. <sup>1</sup>H NMR Based Serum Lipidomic Analysis in Women With Polycystic Ovarian Syndrome (PCOS), *By* Roy Choudhury, S., Chaudhury, K., Duttaray, C., Lodh, I. & Chakravarty, B., *3rd European Lipidomic Meeting*, Pardubice, Czech, (2013)
3. A fast auto white balance scheme for digital pathology, *By* H. Garud, A. K. Ray, M. Mahadevappa, J. Chatterjee, and S. Mandal, *2014 IEEE-EMBS International Conference on - Biomedical and Health Informatics (BHI)*, Valencia (Spain), (2014)
4. A Generalized Framework for Stain Separation in Digital Pathology Applications, *By* Ghosh B, Conjeti S, Karri SPK, Sheet D, Garud H, Ghosh A, Chatterjee J and Ray AK, *Proc. SPIE Medical Imaging: Digital Pathology*, (2014)
5. A micro strain gauge sensor on Polydimethylsiloxane (PDMS) Substrate for artificial lateral line, *By* Abhijit Kakati, and Soumen Das, *IEEE TechSym 2014, Kharagpur*, IIT Kharagpur, (2014)
6. Activity Estimation and Lineage Construction of Cells in Densely Populated Colonies Using Numerical Method Based Greedy Search, *By* S. P. K. Karri, D. Sheet, H. Garud, A. Chaudhury, A. K. Ray, J. Chatterjee, D. Chakraborty, M. Mahadevappa., *Int. Symp. Biomed. Imaging*, San Francisco, CA, USA, (2013)
7. Association Between Baseline Plasma HIV Viral Load And Nasopharyngeal Pneumococcal Colonization in Children with HIV Infection, *By* D. Robert, B.K. Arya, M. Mallick, S. Das

- Bhattacharya et al., *9th International Symposium on Pneumococci and Pneumococcal Diseases*, Hyderabad, (2014)
8. Automated Characterization of Pap Stained Cervical Smears Using Physics of Brightfield Microscopy Optics, By S. P. K. Karri, H. Garud, D. Sheet, R. Malviya, L. Das, A. K. Ray, J. Chatterjee, D. Chakraborty, M. Mahadevappa., *Int. Symp. Biomed. Imaging*, San Francisco, CA, USA, (2013)
  9. BI69A11, a novel small molecule inhibitor of AKT kinase with antitumor activity showed antiproliferative effect on colon cancer by induction of apoptosis, By Ipsita pal, Mahitosh Mandal, *Indian Association for Cancer Research*, New Delhi, (2013)
  10. Celecoxib alleviates tamoxifen-instigated angiogenic effects by ROS-dependent VEGF/VEGFR2 autocrine signaling, By BN Prasantkumar and Mandal M, *San Antonio Breast Cancer Symposium*, San Antonio, TX, USA, (2013)
  11. Celecoxib synergistically potentiates diosgenin induced apoptosis in human colon cancer, By Prashanth Kumar B. N. Mahitosh Mandal, *2nd Global Cancer Genomics Consortium Symposium*, ACTREC, Mumbai, (2012)
  12. Characterization of Polydimethylsiloxane (PDMS) for BioMEMS Application, By Jyoti Wala, Santanu Dhara, and Soumen Das, *IEEE TechSym 2014, Kharagpur*, IIT Kharagpur, (2014)
  13. CHARACTERIZING AND ELUCIDATING MOLECULAR PATHWAYS IN BREAST CANCER STEM CELLS, By Subhayan Das, Aditya Parekh, Mahitosh Mandal, *Indian Association of Cancer Research*, Tribandam, Kerala, India, (2014)
  14. Clinicoepidemiological perspectives of oral precancers and cancers in North Bengal, India, By 2. Satarupa Banerjee, Debdoot Sheet, Amita Giri, Badal Sarkar, Ranjan Ghosh, and Jyotirmoy Chatterjee., *1st Indian Cancer Congress*, Kempinski Ambience Hotel, Delhi, India, (2013)
  15. Combinatorial effect of ZD6474 and Thymoquinone inhibits Src mediated ERK-1/2/STAT3 signaling renders antimetastasis in breast cancer, By Shashi Rajput, Mahitosh Mandal, *24th EORTC-NCI-AACR Symposium-2012 on Molecular Targets and Cancer Therapeutics EJC* 48, , (2012)
  16. Comparison of Smooth and Rough Chitosan Fibers for Cellular Growth Investigations, By Paulomi Ghosh, Reshmi Dey, Santanu Dhara, *4th International Conference on Biomedical Engineering and Technology*, Penang, malaysia, (2014)
  17. Computer - Assisted Approach to Anemic Erythrocyte Classification Using Blood Pathological Information, By Maitreya Maity, Prabir Sarkar, Chandan Chakraborty, *Third International Conference on Emerging Applications of Information Technology (EAIT)*, ISI, Kolkata, (2012)
  18. Content-Based Leukocyte Image Retrieval Ensembling Quaternion Fourier Transform and Gabor-wavelet Features, By Prabir Sarkar , Chandan Chakraborty , Madhumala Ghosh, *12th Int. Conf. on Intelligent Systems Design and Applications (ISDA)*, IEEE, Kochi, (2012)
  19. Contrasting characteristics of drug resistance in breast cancer, By Aditya Parekh, B.N.Prashant Kumar, Shashi Rajput, Sheetal Parida, Goutam Dey, Mahitosh Mandal, *Indian Association of Cancer Research*, Tribandam, Kerala, India, (2014)
  20. Detection of Retinal Vessels in Fundus Images through Transfer Learning of Tissue Specific Photon Interaction Statistical Physics, By Sheet, S. P. K. Karri, S. Conjeti, S. Ghosh, J. Chatterjee, A. K. Ray, *Int. Symp. Biomed. Imaging*, San Francisco, CA, USA, (2013)
  21. Development of multi-phasic calcium phosphate scaffolds from sea shell for bone graft, By Prabhash Dadeech, Santanu Dhara, *TERMIS-AP 2013*, Wu-Zhen China, (2013)
  22. Different Honey Dilution in Modulating Prime Epithelial Gene (p63, E-cadherin, and  $\beta$ -catenin ) expression and in vitro Wound Healing of HaCaT Population(Accepted), By Bag S., Chaudhary A., Barui A., Das R.K., Sheet D., Karry P..K, Banerjee P. and Chatterjee J., *23rd Conference of the European Wound Management Association*, Copenhagen., (2013)
  23. Effect of GW627368X, a novel, potent, selective prostanoid EP4 receptor antagonist on cancer of cervix, By Sheetal Parida, Ipsita Pal, Aditya Parekh, Mahitosh Mandal, *Indian Association of Cancer Research*, Tribandam, Kerala, India, (2014)

24. Electrospun polycaprolactone/collagen nanofiber composite for skin tissue engineering, By Pallabi Pal, Pavan Kumar Srivas, Prabhaskar Dadhich, Bodhisatwa Das, Santanu Dhara, *Second International Conference on Medical Materials, Devices and Regenerative Medicine (MMDRM)*, Kathmandu, Nepal, (2014)
25. Enhanced anticancer activity of dual drug liposome loaded with 5-Fluorouracil and Apigenin via stress mediated pathway involving reactive oxygen and nitrogen species, By Kacoli Sen, Mahitosh Mandal, *Colloids and Nanomedicine*, Amsterdam, Netherlands., (2012)
26. Enhanced susceptibility to apoptotic induction by Mcl1 inhibition through synergistic mechanism of celecoxib and betulinic acid in breast cancer, By Prashanth Kumar B. N. Mahitosh Mandal, *24th EORTC-NCI-AACR Symposium on Molecular Targets and Cancer Therapeutics*, Dublin, Ireland, (2012)
27. Hierarchical Chitosan-Collagen Scaffolds for Healing of Full Thickness Skin Lesions: In vitro and In vivo Evaluation, By Soumi De Sarkar, Santanu Dhara, *TERMIS-AP 2013*, Wu-Zhen, Sanghai China, (2013)
28. Interleukin-8 in follicular fluid is a promising prognostic marker for IVF success in women with endometriosis, By R. Chattopadhyay, A.K. Singh, S. Roychoudhury, S. Ghosh, G. Bose, K. Chaudhury, M. Chakravarty and B.N. Chakravarty, *Annual Meeting of European Society of Human Reproduction and Embryology*, London, (2013)
29. LASER Patterned Nano Silver Doped Calcium Phosphate Scaffolds for Bone Graft Application, By B. Das, P. Dadheech, P. Pal, P. Srivas, S. Maiti, P. Das Mohapatra, S Dhara, *TERMIS-AM 2013*, Atlanta, US, (2013)
30. Learning of Tissue Photon Interaction in Laser Speckle Contrast Imaging for Label-Free Retinal Angiography, By Kausik Basak, Debdoot Sheet, Sri Phani Krishna Karri, Manjunatha Mahadevappa, Jyotirmoy Chatterjee, P.K. Dutta, *2014 IEEE International Symposium on Biomedical Imaging*, Beijing, China, (2014)
31. Learning Scale-Space Representation of Nucleus for Accurate Localization and Segmentation of Epithelial Squamous Nuclei in Cervical Smears, By Sri Phani Krishna Karri, Hrushikesh Garud\*, Debdoot Sheet, Jyotirmoy Chatterjee, Debjani Chakraborty, Ajoy Kumar Ray, Manjunatha Mahadevappa, *IEEE-EMBS International Conferences on Biomedical and Health Informatics*, Valencia, Spain, (2014)
32. Metabolic Profiling Using NMR and LC-MS Based Approaches Towards Detection of Early Disease Markers of Breast Cancer in Diagnosis and Prognosis, By More, T. H., Roy Choudhury, S., Dange, K., Dutta, M., Chaudhury, K., Rapole, S., *Indo-US Symposium on Mass Spectrometry Based Metabolomics in Disease Biology.*, Thiruvananthapuram, (2014)
33. Method and System for Segmentation of Clustered Nuclei in Microscopic Images of Breast Fine Needle Aspiration Cytology Smears, By H. Garud, S. P. K. Karri, D. Sheet, R. Malviya, A. K. Ray, J. Chatterjee, M. Mahadevappa, *Int. Symp. Biomed. Imaging*, San Francisco, CA, USA, (2013)
34. Microelectrode Based Biosensor to Study the Impedance of Breast Cancer Cell Lines in Suspensions, By R. Pradhan, A. Mitra, S. Das, M Mandal, S Das, *International Conference on Smart Materials, Structures and Systems*, (2012)
35. Modelling a BCI system to estimate FES stimulation intensity for individual stroke survivors in foot drop cases, By M. Mahadevappa C. Shendkar P. Lenka A. Biswas R. Kumar, *11th Vienna International Workshop on FES*, Graz, Austria, (2013)
36. Multiscale Noise-Adaptive Homomorphic Filtering based Speckle Denoising in Laser Speckle Imaging, By Kausik Basak, Manjunatha M, Pranab Dutta, *NCVPRIPG 2013*, IIT Jodhpur, (2013)
37. Nano-Silver Substituted Calcium Phosphate Gelatin Composites for Bone Tissue Engineering, By B. Das, S Dhara, *International Conference on Functional Materials (ICFM-2014)*, Materials Science IIT KGP, (2014)
38. Nano/microfibrous chitosan/collagen composite for skin tissue engineering, By Pallabi Pal, Pavan Kumar Srivas, Prabhaskar Dadhich, Bodhisatwa Das, Santanu Dhara, *International Conference on Functional Materials (ICFM-2014)*, IIT Kharagpur, (2014)
39. Non-invasive Optical Coherence Tomography Evaluation of Wound Healing Progression under Topical Application Honey with Immuno-histochemical Corroboration(Accepted), By



- Chaudhary A., Bag S., Das R.K., Barui A., Sheet D., Karry P.K, Banerjee P. and Chatterjee J, *23rd Conference of the European Wound Management Association*, Copenhagen, (2013)
40. Optical trapping of human spermatozoa: a non-invasive technique to assess sperm motility., By Elavarasan Subramani, Gunja Bose, Himanish Basu, Ratna Chattopadhyay, Deepak Mathur, Baidyanath Chakravarty, Koel Chaudhury, *ART-AIM Update 2013*, Kolkata, (2013)
  41. Phosphorylated Alumina Fibrous Scaffolds for Bone Tissue Engineering, By Mohanty, S., Rameshbabu, A.P., Dhara, S., *TERMIS-AP 2013*, Wu-Zhen, Sanghai China, (2013)
  42. Pneumococcal Carriage In HIV Infected Children And Mothers From West Bengal, By BK Arya, S. Das. Bhattacharya, S K Niyogi et al., *9th International Symposium on Pneumococci and Pneumococcal Diseases*, Hyderabad, (2014)
  43. Pneumococcal serotypes isolated in nasopharyngeal samples from vaccine naïve HIV infected mothers and children, By Banuja K Acharya, , S. Niyogi, R. Jalagandeeswaran, S. Mandal, A. Manoharan, S. Das Bhattacharya, S. Bhattacharya, *9th International Symposium on Pneumococci and Pneumococcal Diseases*, Hyderabad, (2014)
  44. Pneumonia Prevention in Families Affected by HIV: Ground Work Behind the Conduct of an Ongoing Study in Rural West Bengal, By Ranjan Saurav Das BK Arya S. Das Bhattacharya et al, *International Symposium of Pneumococcus and Pneumococcal Disease-9*, Hyderabad, (2014)
  45. Proton NMR based serum lipidomic analysis in women with polycystic ovarian syndrome., By Roy Choudhury, S., Chaudhury, K., Chattopadhyay, R., Lodh, I. Duttaray, C., Chakravarty, B., *ART-AIM UPDATE 2013*, Kolkata, (2013)
  46. Random forest learning of ultrasonic statistical physics and object spaces for lesion detection in 2D sonomammography, By Sheet D, Karamalis A, Kraft S, Noel PB, Vag T, Sadhu A, Katouzian A, Navab N, Chatterjee J and Ray AK, *Proc. SPIE Medical Imaging: Ultrasonic Imaging, Tomography, and Therapy*, (Bosch JG, Doyley MM, Eds), , (2013)
  47. Recognizing Pathobiological Signatures of Oral Precancers through Multimodal Imaging. By Satarupa Banerjee, Debdoot Sheet, Raunak K. Das, Anji Anura, Swarnendu Bag, Amita Giri, Ranjan Rashmi Paul, Mousumi Pal, Badal Sarker, Ranjan Ghosh, Bhaskar Ghosh, and Jyotirmoy Chatterjee., *1st Indian Cancer Congress*, Kempinski Ambience Hotel, Delhi, India, (2013)
  48. Reconstruction of Customized Mandible using Alumina Fiber Reinforced Polymer Composite by 3D imaging, Rapid Tooling and Molding, By Pavan Kumar Srivas, Saralasrita Mohanty, Partha Saha, Santanu Dhara, *Second International Conference on Medical Materials, Devices and Regenerative Medicine (MMDRM)*, Kathmandu, Nepal, (2014)
  49. Role of follicular fluid concentrations of MMP-2, MMP-9 and their tissue inhibitors (TIMP-1, TIMP-2) on oocyte quality in PCOS women, By Gunja Bose, Elavarasan Subramani, Sanghamitra Ghosh, Ratna Chattopadhyay, Koel Chaudhury, Baidyanath Chakravarty, *ART-AIM Update 2013*, Kolkata, (2013)
  50. Serum IL-10 is a predictive marker of poor endometrial receptivity in women with idiopathic recurrent spontaneous miscarriage, By A. Ganesh, P. Banerjee, B. Chakravarty, K. Chaudhury., *69th Annual Meeting of American Society of Reproductive Medicine*, Boston, (2013)
  51. Simulation and Feasibility Study of Flow Sensor on Flexible Polymer for Healthcare Application, By Debashis Maji and Soumen Das, *IEEE EMBS Special Topic Conference on Point-of-Care Healthcare Technologies (POCHT)*, Bangalore, India, (2013)
  52. Simulation of Electrode-Tissue Interface for Electrical Stimulation of Retinal Ganglion Cells, By Satarupa Biswas, Soumen Das and Manjunatha Mahadevappa, *2014 IEEE International Conference on Electronics, Computing, Communication Technologies (IEEE CONECCT2014)*, IISc., Bangalore, (2014)
  53. Simulation of Electrode-Tissue Interface with Biphasic Pulse Train for Epiretinal Prosthesis, By S. Biswas, S. Das, and M. Mahadevappa, *COMSOL Conference*, bangalore, India, (2013)
  54. Streptococcus pneumoniae, Staphylococcus aureus, and Haemophilus influenzae Nasopharyngeal Colonization in HIV Infected Children and Their Mothers During a

- Haemophilus influenzae type b Vaccine Stu, By BK Arya, S. Das Bhattacharya, SK Niyogi, et al., *9th International Symposium on Pneumococci and Pneumococcal Diseases*, Hyderabad, (2014)
55. Studies on Removal of Arsenic from water by adsorption on Laterite and Ferric-Hydroxide coated Bentonite, By Anindya Mitra, Punam Mukhopadhyay, Analava Mitra, *IEE Tech Sym*, IIT KGP, (2014)
56. Thymoquinone alters Akt phosphorylation and mediates apoptotic induction in Human breast cancer cells, By Shashi Rajput, Mahitosh Mandal, *ICSCC*, New Delhi, (2012)

## School of Water Resources

### **Head**

Prof. Dhrubajyoti Sen

### **Assistant Professors**

Sahoo, Bhabagrahi

*Ph.D.(IIT Roorkee)*, Water Management, Flood Analysis, Open Channel Hydraulics, Meso-scale Solute Transport Dynamics, River Basin Management, Hydro- and Agro-meteorology, Soft Computing in Hydrology

Tiwari, Manoj Kumar

*Ph.D.(IIT Kanpur)*, Fate and transport of pollutants in water and soil mediums, Treatment of hazardous and persistent pollutants in surface and ground waters, Contaminated site management, Water/Wastewater treatment, Development of analytical protocols, Water Supply and Distribution

### **Faculty Appointments**

Manoj Kumar Tiwari

Assistant Professor

### **New Academic Programmes**

The M. Tech. Programme in Water Engineering and Management aims at professing the students with integrated and interdisciplinary approaches of water management involving hydrological, biophysical, chemical, economic, institutional, legal, and policy-planning aspects, to solve the ever-growing set of water-related challenges in industry, agriculture, and domestic sectors. The Programme is intended for professionals and researchers from a wide range of backgrounds. It aims to develop knowledge, insight and skills required to design, implement and evaluate water management policies and strategies. Graduates will be able to promote the judicious use of water and achieve effective governance of water resources.

### **Brief Description of on-going activities**

A sponsored network project entitled "Land Use and Land Cover (LULC) Dynamics in Relation to Human Dimensions and Climate in Mahanadi River Basin, Orissa", funded by NRSC, Hyderabad, 2009-2014

A sponsored network project entitled "Interdisciplinary network for holistic environment system analysis, eco-system services, integrated modelling and sustainable resources management (INNO-ASIA)", funded by the German Federal Ministry of Education and Research (BMBF), 2010-2014

A research project on "Development of a 1-D Transient Conservative Pollutant Transport Model for Meso-scale Application" is sponsored by SRIC, IIT Kharagpur under ISIRD to Dr. B. Sahoo, Assistant Professor for Feb. 2013 – Jan. 2015.

"Preparation of Ganga River Basin Management Plan" (Principal Investigator : Joint Project of 7 IITs; Sponsor: National River Conservation Directorate, MOEF, India; Duration: 2010 – Dec. 2013).

### **Thrust Areas**

1. River basin planning and management (considering the aspects of flood, drought or contaminant)
2. Water and wastewater treatment and quality control

3. Urban, rural and industrial water supply and distribution systems
4. Remote sensing and GIS application in water resources
5. Water governance and policy issues
6. Irrigation and drainage system planning
7. Climate impact on water and environment

#### ***New Acquisitions***

1. Double Ring Infiltrometer
2. Automatic Raingauge

#### ***International Collaborations***

Initiated collaboration with the Danish Hydraulic Institute (DHI)-India: Water & Environment Pvt. Ltd., New Delhi from 2013 onwards for joint research guidance of two M.Tech. students for enhancing their employment opportunity.

#### ***Lectures by Visiting Experts***

1. Hydrodynamics / mixing and transport *by* Walter H. Graf (Professor, Laboratoire de recherches hydrauliques, Lausanne, Suisse)

#### ***Member - Professional Bodies***

1. Sahoo, Bhabagrahi, *Life Member* - Indian Association of Hydrologists (IAH)
2. Sahoo, Bhabagrahi, *Regular Member* - American Geophysical Union (AGU)

#### ***Member - Editorial Board***

1. Sahoo, Bhabagrahi (2013) *Associate Editor* - International Agricultural Engineering Journal (IAEJ)

#### ***Sponsored Research Projects***

1. AI-based prediction of storm and inundation from Doppler weather radar (MHRD, Rs.26.44 Lakhs)
2. Development of a 1-D Transient Conservative Pollutant Transport Model for Meso-scale Application (ISIRD, SRIC, Rs.5.00 Lakhs)
3. Future of Cities (Management of Urban Water Supply Network) (MHRD, Rs.0.00 Lakhs)
4. INNO-ASIA networking project (Federal Ministry of Education and Research (BMBF), Germany, Rs.0.00 Lakhs)
5. Land Use Land Cover (LULC) Dynamics in Relation to Human Dimension and Climate in Mahanadi River Basin, Orissa (MRB) (Indian Institute of Remote Sensing (IIRS), Dehradun, Rs.12.80 Lakhs)

#### ***Consultancy Projects***

1. Hydrological Data Analysis for Estimation of Monsoon and Lean E-flows of the Dri and Tangon Rivers in Arunachal Pradesh (EMAA) (Central Inland Fisheries Institute (ICAR), Barrackpore, Kolkata, Rs.0.50 Lakhs)

### ***Books Published***

1. 38. Deka, B.C., Chatterjee, D., Sahoo, B., Patra, M.K., Thirugnanavel, A., Kumar, R., Krose, M., Bha: Soil-Water-Plant-Animal-Society Continuum Approach for Livelihood Improvement of Konyak Tribe of Mon in Nagaland *published by* ICAR Research Complex for NEH Region, Umiam, Meghalaya, India (2013)

### ***Papers Published in Journals***

1. Closure to: Standardization of reference evapotranspiration models for a sub-humid valley rangeland in the Eastern Himalayas *By* Sahoo, B. *J. Irrigation and Drainage Engineering, ASCE, doi: 10.1061/(ASCE)IR.1943-4774.0000594*, 139 (9), 795-796 (2013)
2. Field application of the multilinear Muskingum discharge routing method, *By* Sahoo, B. *Water Resources Management, Springer, doi: 10.1007/s11269-012-0228-5*, 27(5), 1193-1205 (2013)
3. Kinetics of biotransformation of chlorpyrifos in aqueous and soil slurry environments *By* Tiwari, M.K. and Guha, S. *Water Research* 51, 73-85 (2014)

### ***Papers Presented in Conferences***

1. A Multilinear Discrete Cascade Model for Stage Hydrograph Routing in Compound Channels, *By* M. Perumal, B. Sahoo and T. Moramarco, *Dooge-Nash International Symposium*, Dublin, Ireland, (2014)
2. Matched diffusivity theory of the Muskingum method - is it needed?., *By* Perumal, M., and B. Sahoo, *World Environmental & Water Resources Congress 2013: Showcasing the Future*, Cincinnati, USA, (2013)

## Vinod Gupta School of Management

### **Head**

Prof. Kalyan Kumar Guin

### **Professors**

Guin, Kalyan Kumar *B.Tech.(IIT Kharagpur),*  
Mukerjee, Prithwis *Ph.D.(Texas),*  
Rajib, Prabina *Ph.D.(IIT Kharagpur), Corporate Finance, Derivatives ( Financial & Commodity), Indian Capital Market*  
Sinha, Gautam *Ph.D.(IIT Kharagpur),*  
Teltumbde, Anand ,

### **Associate Professors**

Datta, Biplob *Ph.D (IIT Delhi), Marketing Management, Leadership and Teamwork, Services Marketing*  
De, Sadhan Kumar *Ph.D.(UK),*  
Sahney, Sangeeta *Ph.D.(IIT Delhi), Quality in Education, Sales and Distribution Management, Services Marketing, Services Quality, Organizational Behavior, Marketing Management, Consumer Behavior*

### **Assistant Professors**

Arunprasad, P *Ph.D.(IIT Madras),*  
Barai, Parama *Fellow (XLRI, Jamshedpur),*  
Bhattacharya, Sujoy *Ph.D.(IIIT&Mgt, Gualior), Data Analytics, Option Pricing, Quantitative Marketing*  
Madhavan, Vinodh *D.B.A.(USA), Credit Default Swap Indices, Long-Term Dependence, Nonlinear Time Series Analysis*  
Malik, Aradhna *Ph.D.(Univ of Denver), Communication Disorders, Intercultural Communication, Human Technology Interaction, Management of Public Health, Neuro Linguistic Programming (NLP), Ageing, Orality*  
Mishra, Chandra Sekhar *Ph.D.(Utkal University), Financial Reporting and Analysis, Mergers and Acquisitions, Business Valuation, Financial Markets*  
Misra, Arun Kumar *Ph.D.(IIT,Mumbai), Capital Market, Financial Markets, Commercial Banking, Corporate Finance, International Finance, Risk Management, Financial Economics, Competition Assessment*  
Mukhopadhyay, Susmita *Ph.D.(Calcutta Univ.), Organizational Health and spiritual health, Human Resource Management, Business Ethics, Microfinance, Competency Mapping*  
Pradhan, Rudra Prakash *Ph.D.(IIT Kharagpur), Econometric Modelling, Infrastructure Finance, Financial Markets, Financial Econometrics*  
Sarkar, Ashutosh *Ph.D.(IIT Kharagpur),*

### **Visiting Faculty**

Ghosh, Kunal Kanti                      *M.Tech.(IIT Kharagpur)*, Supply chain management

***Faculty Resignation***

P. Arunprasad                              Assistant Professor

Madhavan, Vinodh                        Assistant Professor

***New Academic Programmes***

Dual Degree Postgraduate programme in Financial Engineering with interested departments at IIT Kharagpur.

Launched 3-Year Executive MBA (EMBA) Programme in Kolkata and Bhubaneswar in July-September 2010.

***Brief Description of on-going activities***

Currently offering MBA, EMBA, MS, Dual Degree (B Tech + MS in Financial Engineering) and Ph.D. degrees.

Launched VGSoM Working Paper Series in February 2010.

Conducting Management Development Programs and In-House Training Programs for various industries.

***Thrust Areas***

1. Big Data Analytics including Financial Analytics, Marketing Analytics and HR Analytics
2. Banking, Derivatives and Risk Management,
3. Project Management

***New Acquisitions***

1. Bloomberg Real-time Database
2. AceEquity Financial Database

***International Collaborations***

Continuing collaboration with University of Nebraska, Omaha, and Creighton University

***Lectures by Visiting Experts***

1. India Awareness and Local Roots *by* Ms. Ranjini Manian (CEO, Global Adjustments)
2. Life beyond VGSoM *by* Mr. Shibaji Bose (Director, Consultree India)
3. CSR and Companies Bill *by* Mr. Jay Vikram Bakshi (CEO, DigiQom Solutions)
4. Overview of FMCG Industry *by* Mr. Chironmoy Chatterjee (COO, Perfetti Van Melle)
5. The Impact of Offshoring New Product Development (NPD) to Emerging Markets on Shareholder Value *by* Prof. Venkatesh Shankar (Professor, Coleman Chair in Marketing, Texas A&M University)
6. Steps to Entrepreneurship *by* Mr. Romit Choudhury (Co-Founder, Northwest College for Advanced Learning)
7. Big Data & Interpretation *by* Mr. Rohit Tripathi (VP- Product and Innovation, SAP Labs)

8. Global Trade, Tax and Social Justice *by* Dr. Krishen Mehta (Senior Advisor, Tax Justice Network)
9. Overview of Consulting Industry in India *by* Mr. Anubrata Chakraborty (Director, Deloitte, Touche & Tomasu Consulting India)
10. Building Leadership Skills while at Business School *by* Mr. Ravi Santhanam (Founder - MetaDrsti Advisory)
11. Business of Entertainment *by* Mr. Narayan Ranjan (Chief Financial Officer at Viacom 18 Media Pvt. Ltd.)
12. B2B Marketing *by* Mr. Arun Kumar (Head, Channel management , Blue Star Ltd.)
13. Impact of Technology on the Securities Markets in India *by* Mr. Nehal Vohra (Chief Regulatory Officer, BSE India)
14. Corporate Communications *by* Ms. Vasudha Jha (Director, Kirkos Consultancy)
15. Made in India (Brand Empowerment) *by* Mr. Arnab SenGupta ("National Head - Modern Trade, B2B & Business Development Emami Biotech Limited")

### ***Doctoral and MS Degrees Awarded***

1. Shashwati Banerjee : Ultra Poor Migrants' Survival Against Highly Irregular Income – A case study of few districts in West Bengal.(MS)
2. Subhasis Biswas : Relative and Informational Efficiency, Maturity Effect and Market Integration: An Empirical Study on select Indian Commodity Futures(Ph.D.)
3. Rakesh Arrawatia : Assessment and Implications of Competition in the Indian Banking Sector(Ph.D.)
4. Punyaslok Dhall : Factors affecting Buyer-Seller Relationship Sustainability in Small and Medium Enterprises in India(Ph.D.)
5. Shiv Shankar Tripathi : Development of Insights on Product and Service Innovations in Organisations(Ph.D.)
6. Shashikant Pandey : Financial Development, ICT Diffusion and Economic Growth: The Causal Nexus in Asia(Ph.D.)
7. Rituparna Basu : Store Format choice In Emerging Retail Markets(Ph.D.)
8. Prasant Rout : A Strategic analysis of implementation and usage effectiveness of Enterprise Information systems in Indian Organisations(Ph.D.)
9. N.M.Leepta : Post Merger and Acquisition Performance: Evidence from Manufacturing Companies in India(Ph.D.)
10. Swapan Purkait : A study of Phishing Attacks and Effectiveness of the Countermeasures(Ph.D.)

### ***Member - Professional Bodies***

1. Datta, Biplab, *Regular* - Council of Architecture
2. Sahney, Sangeeta, *Member Category* - All India Management Association
3. Sahney, Sangeeta, *Member* - Indian Society for Quality (ISQ) (Asian Network for Quality)
4. Pradhan, Rudra Prakash, *Member* - Eco-Ethic International Union, Germany
5. Pradhan, Rudra Prakash, *Member* - Society for Sustainable Infrastructure Development & Healthy Environment
6. Pradhan, Rudra Prakash, *Senior Member* - Multiple Criteria Decision Making, USA
7. Pradhan, Rudra Prakash, *Member* - Society for Infrastructure System
8. Pradhan, Rudra Prakash, *Member* - Indian Society for Probability & Statistics
9. Pradhan, Rudra Prakash, *Member* - Transportation Research Group of India
10. Pradhan, Rudra Prakash, *Member* - International Association of Financial Engineers
11. Pradhan, Rudra Prakash, *Senior Member* - Regional Science Association, India
12. Pradhan, Rudra Prakash, *Senior Member* - Operational Research Society of India
13. Pradhan, Rudra Prakash, *Member* - International Project Finance Association
14. Pradhan, Rudra Prakash, *Member* - Sustainability Research & Policy Network



15. Pradhan, Rudra Prakash, *Senior Member* - Indian Econometric Society
16. Pradhan, Rudra Prakash, *Member* - Indian Institute of Banking & Finance
17. Pradhan, Rudra Prakash, *Member* - Indian Science Congress
18. Pradhan, Rudra Prakash, *Member* - Global Development Network
19. Mishra, Chandra Sekhar, *Life Member* - Indian Accounting Association
20. Sarkar, Ashutosh, *Member* - Production and Operations Society USA
21. Sarkar, Ashutosh, *Life Member* - Society of Operations Management
22. Sarkar, Ashutosh, *Life Member* - Indian Institute of Industrial Engineering
23. Malik, Aradhna, *Member* - American Psychological Association
24. Malik, Aradhna, *Regular* - Academy of Management
25. Malik, Aradhna, *Member* - Asian Society Against Dementia
26. Malik, Aradhna, *Life Member* - Society for Scientific Values
27. Malik, Aradhna, *Mentor* - National Mentoring Network
28. Malik, Aradhna, *Regular* - International Communication Association
29. Malik, Aradhna, *Life Member* - Indian National Portage Association
30. Mukerjee, Prithwis, *Founder* - ACM India Council - official India affiliate of the Association of Computing Machinery, US

***Member - Editorial Board***

1. Datta, Biplab (2011) *Reviewer* - Globsyn Management Journal
2. Malik, Aradhna (2013) *Associate Copy Editor* - Asian English as a Foreign Language Journal
3. Mukhopadhyay, Susmita (2009) *Member* - JIS Management Vista,
4. Mukhopadhyay, Susmita (2009) *reviewer* - Psybernews
5. Mukhopadhyay, Susmita (0) *Member of editorial board* - Psybernews
6. Mukhopadhyay, Susmita (2009) *Reviewer* - PRAYAAS - The Journal of Management,
7. Mukhopadhyay, Susmita (2009) *Member* - Pragyaan : Journal of Management
8. Nag, Barnali (2006) *Associate Editor* - South Asia Economic Journal
9. Nag, Barnali (0) *Reviewer* - Energy - The International Journal
10. Nag, Barnali (0) *Reviewer* - Energy Policy
11. Nag, Barnali (0) *Reviewer* - International Journal of Environmental Technology and Management
12. Nag, Barnali (2004) *Associate Editor* - South Asia Economic Journal
13. Nag, Barnali (0) *Reviewer* - International Journal of Environment and Waste Management
14. Nag, Barnali (2003) *Associate Editor* - South Asia Economic Journal
15. Nag, Barnali (2005) *Associate Editor* - South Asia Economic Journal
16. Pradhan, Rudra Prakash (0) *Reviewer* - Cities
17. Pradhan, Rudra Prakash (0) *Reviewer* - Journal of Research in International Business and Management
18. Pradhan, Rudra Prakash (0) *Reviewer* - Journal of Management and Business
19. Pradhan, Rudra Prakash (0) *Reviewer* - International Journal of Educational Research
20. Pradhan, Rudra Prakash (0) *Reviewer* - International Research Journal of Management and Business Studies
21. Pradhan, Rudra Prakash (0) *Reviewer* - International Journal of Peace and Development Studies
22. Pradhan, Rudra Prakash (0) *Reviewer* - Neural Computing and Applications
23. Pradhan, Rudra Prakash (0) *Member* - The Management Accountant
24. Pradhan, Rudra Prakash (0) *Member* - Journal of Social Welfare and Management
25. Pradhan, Rudra Prakash (0) *Reviewer* - Review of Economics and Finance
26. Pradhan, Rudra Prakash (0) *Reviewer* - Kindler
27. Pradhan, Rudra Prakash (2009) *Reviewer* - Journal of Economics and International Finance
28. Pradhan, Rudra Prakash (0) *Reviewer* - Journal of Social and Management Sciences
29. Pradhan, Rudra Prakash (0) *Reviewer* - Universal Journal of Marketing and Business Research

30. Pradhan, Rudra Prakash (0) *Member* - International Journal of Economics and Management Sciences
31. Pradhan, Rudra Prakash (0) *Reviewer* - Review of Urban and Regional Development Studies
32. Pradhan, Rudra Prakash (0) *Member* - Australian Journal of Business and Management Research
33. Pradhan, Rudra Prakash (0) *Reviewer* - Journal of Management and Technology
34. Pradhan, Rudra Prakash (0) *Member* - Asian Economic and Financial Review
35. Pradhan, Rudra Prakash (0) *Reviewer* - British Journal of Economics, Management and Trade
36. Pradhan, Rudra Prakash (0) *Reviewer* - Arth Anvesan
37. Pradhan, Rudra Prakash (0) *Reviewer* - South Asian Journal of Management
38. Pradhan, Rudra Prakash (0) *Reviewer* - Malaysian Journal of Economic Studies
39. Pradhan, Rudra Prakash (0) *Member* - Journal of Applied Economics and Policy Analysis
40. Pradhan, Rudra Prakash (0) *Member* - International Journal of Financial Research
41. Pradhan, Rudra Prakash (0) *Reviewer* - African Journal of Economic and Management Studies
42. Pradhan, Rudra Prakash (0) *Member* - Pragyaan
43. Pradhan, Rudra Prakash (0) *Reviewer* - South Asia Economic Journal
44. Pradhan, Rudra Prakash (0) *Member* - ARASH
45. Pradhan, Rudra Prakash (0) *Member* - African Journal of Science and International Relations
46. Pradhan, Rudra Prakash (0) *Reviewer* - Energy Systems
47. Pradhan, Rudra Prakash (0) *Member* - International Journal of Happiness and Development
48. Pradhan, Rudra Prakash (0) *Member* - Journal of Management and Strategy
49. Pradhan, Rudra Prakash (0) *Reviewer* - Economic Modelling
50. Pradhan, Rudra Prakash (0) *Reviewer* - Journal of Social Sciences
51. Pradhan, Rudra Prakash (0) *Reviewer* - Journal of Developing Areas
52. Sahney, Sangeeta (2012) *Member of Review Committee* - Globsyn Management Journal
53. Sahney, Sangeeta (2013) *Reviewer* - International Journal of Services Sciences
54. Sahney, Sangeeta (2012) *Member of Review Committee* - The TQM Journal
55. Sahney, Sangeeta (2012) *Member of Review Committee* - The International Journal of Organizational Analysis
56. Sahney, Sangeeta (2013) *Reviewer* - Journal of Asia Business Studies
57. Sahney, Sangeeta (2012) *Member of Editorial Advisory Board* - Emerald Emerging Markets Case Studies
58. Sahney, Sangeeta (2012) *Member of Review Committee* - Quality Assurance in Education
59. Sahney, Sangeeta (2012) *Member of Review Committee* - The International Journal of Business and Information
60. Sahney, Sangeeta (2012) *Member of Editorial Board* - The International Journal of Engineering, Science and Technology
61. Sahney, Sangeeta (2012) *Member of Editorial Board* - The International Journal of Business, Management and Social Sciences
62. Sahney, Sangeeta (2013) *Reviewer* - International Review on Public and Non-Profit Marketing
63. Sarkar, Ashutosh (2009) *International Editorial Review Board* - International Journal of Applied Industrial Engineering

#### ***Awards & Honours***

1. Sahney, Sangeeta (2014) *Outstanding Paper Award, International Conference of Technology and Business Management, INFOMS, Dubai, 24-26th March, 2014*

#### ***Sponsored Research Projects***

1. A Comparative Assessment of Performance of Select Institutes of Higher Education. (Indian Council of Social Science Research, ICSSR, Rs.4.86 Lakhs)

2. Econometric Modelling on Data Analysis (, Rs.5.00 Lakhs)
3. Econometric Modelling on Time Series (, Rs.2.50 Lakhs)
4. Money management Issues and Practices of the Ultra Poor Populations in West Bengal (ISIRD, Rs.0.00 Lakhs)
5. Outlook of Venture Capitalists towards academic startups (ISIRD, Rs.5.00 Lakhs)
6. Reconfiguring DANA (generosity) as a new Institutional Financial Mechanism for Social Enterprises (DGE) (MHRD, Rs.75.00 Lakhs)
7. Risk Management in Supply Chain: A Study from the Perspective of Indian Industry (ISIRD, IIT Kharagpur, Rs.5.00 Lakhs)
8. Socio Economic Development in India (, Rs.0.00 Lakhs)
9. The ageing population in India (Sponsored Research and Industrial Consultancy wing of IIT Kharagpur, Rs.0.00 Lakhs)

### ***Consultancy Projects***

1. Delay analysis of 2nd Phase Expansion of NALCO's Alumina Refinery (NALCO, Rs.0.00 Lakhs)
2. Operations Gurukul Workshop (Tata Management Training Centre [TMTC] Pune, Rs.3.00 Lakhs)
3. Performance Evaluation of Continuous Surface Miner at Panchpatmali Bauxite Mines (NALCO, Rs.0.00 Lakhs)
4. Project Management for Coal India Executives (Indian Institute of Coal Management [IICM], Ranchi, Rs.2.50 Lakhs)
5. Project Management Module for Voltas Executives (Tata Management Training Centre [TMTC] Pune, Rs.1.50 Lakhs)

### **Visits Abroad by Faculty Members**

1. Sahney, Sangeeta - International Conference of Technology and Business Management, INFOMS (American University of Emirates, Dubai, ) 24-26th March, 2014
2. Datta, Biplab - International immersion for EMBA students (University of Nebraska at Omaha, USA, ) 1 week
3. Pradhan, Rudra Prakash - Conference (Thailand, ) February
4. Pradhan, Rudra Prakash - Conference (Netherlands, ) 2013

### **Invited Lectures by Faculty Members**

1. Commodity Market regulation *by* Rajib, Prabina (Asian Business School, BBSR)
2. Exotic Commodity Derivatives *by* Rajib, Prabina (XLRI)
3. Intercultural communication *by* Malik, Aradhna (Narula Institute of Technology, Agarpara, Kolkata)
4. Intercultural Communication *by* Malik, Aradhna (IIT Guwahati)

### ***Books Published***

1. Biplab Datta: Services Marketing: A Practical Approach *published by* Lap Lambert Publishing, Germany (2013)
2. Dr Amita, Dr D Acharya, Dr I Roy Chowdhury, Dr Lakshmi Kumar, Dr S Mukhopadhyay, Dr Veerashankarappa: EFFECT OF RESERVE BANK OF INDIA REGULATIONS ON PUBLIC SECTOR LENDING FOR MICROFINANCE INSTITUTIONS *published by* IFMR Chennai (2012)
3. Dr. Amita Dharmadhikary-Yadwabkar, Dr. Lakshmi Kumar, Dr. Mani Nandhi, Dr. Susmita Mukhopadhyay, Dr.: RETHINKING RESERVE BANK OF INDIA (RBI) REGULATIONS

FOR MFIS AN ANALYSIS OF MICROFINANCE CLIENTS FROM URBAN AND SEMI-URBAN COMMUNITIES *published by IFMR Chennai* (2013)

4. Prabina Rajib: Commodity Derivatives & Risk Management *published by PHI Learnings* (2014)

#### ***Short-Term Courses, Training Programmes and Workshops organised***

1. 6-day Supervisory Development Programme for L&T Construction (6 Days)
2. MDP for E2 & E3 Level Executives of UCIL (Two days)
3. Supervisory Training workshop for L & T (One week)

#### ***Papers Published in Journals***

1. Associated effects of index composition changes: an evidence from the S&P CNX Nifty 50 index *By Rehman A, P. Rajib* (2014), *Managerial Finance* Vol. 40, No.4 pp: 37 (2014)
2. Buyer's Motivation For Online Buying: An Empirical Case of Railway E – Ticketing In Indian Context *By Sahney, S., Ghosh,K. and Shrivastava, A.* *Journal of Asia Business Studies* Vol. 8, No.1, 43-64 (2014)
3. Commodity Derivatives & Risk Management *By Prabina Rajib Text Book ( ISBN: 978-81-203-4899-8)* Vol.1, Pages: 456 (2014)
4. Comparable firm's P/E Multiple and IPO Valuation: An empirical investigation for Indian IPOs, *By S. Sahoo & P. Rajib* *Decision:The Journal of Indian Institute of Management Calcutta*, 40(1-2), pp27-46 (2013)
5. Conceptualizing Consumer 'Trust' in Online Buying Behavior: An Empirical Inquiry and Model Development in Indian Context *By Sahney, S., Ghosh,K. and Shrivastava, A.* *Journal of Asia Business Studies* Vol.7, No.3, 278-98 (2013)
6. Customer Satisfaction in Indian Retail Banking: A Grounded Theory Approach *By Mandal, P.C. and Bhattacharya, S.* *The Qualitative Report* Vol 18(28) (2013)
7. Customer satisfaction in Indian retail banking: Scale development and validation *By Mandal, P.C. and Bhattacharya, S.* *International Journal of Advances in Management and Economics* (accepted) (2014)
8. Developing a Scale to Measure Students' Perception of Service Quality *By Jain, R., Sahney, S. and Sinha, G.* *The TQM Journal* Vol.25, No.3, 276-94 (2013)
9. Do Mergers and Acquisitions Pay Off Immediately? Evidence from Acquisitions in India *By Leepsa NM & Mishra Chandra Sekhar* *South Asian Journal of Management* 20(3), 39-57 (2013)
10. Economic Growth and Financial Development: Evidence from Panel Cointegration in India and Pakistan *By Pradhan R P* *South Asian Journal of management* 96-119 (2013)
11. Evolution of Non-Food Organised Indian Retail: A Historical Perspective *By Das, Gopal Kalyan Kumar Guin and Biplab Datta* *IIMS Journal of Management Science* 4 (2), 178-190 (2014)
12. Impact of Organizational Sociotechnical System on Managerial Retention: A Structural Equation Modeling Approach *By Ghosh, K. and Sahney, S.* *International Journal of Indian Culture and Business Management* Vol.7, No. 2, 171-91 (2013)
13. Impact of store personality antecedents on store personality dimensions: An empirical Study of Department Retail Brands *By Das Gopal, Kalyan Kumar Guin and Biplab Datta* *Global Business Review* 14, 3, 471 - 486 (2013)
14. Learning customer service from real life situations *By Bhattacharya, K. & Datta, B.* *The Marketing Review* Vol. 13 (2), 191-215 (2013)
15. Marketing Competitiveness: A Case on Launch of TATA Nano *By Alagappan, B.C., Sahu, S. and Sahney, S.* *International Journal of Global Business and Competitiveness* Vol. 8, No. 1, 39-51 (2013)
16. Net Promoter Score: A Conceptual Analysis *By Mandal, P. C. & Bhattacharya, S* *International Journal of Management Concepts and Philosophy(Accepted)* (2014)

17. Role of industry relatedness in performance of Indian acquirers - long and short run effects  
By Barai, P and Mohanty, P *Asia Pacific Journal of Management* 1-29 (2014)
18. The Determinants of Long Run Finance Development: The ARDL Bound Testing Approach  
By Pradhan R P *Journal of Social and Management Sciences* Forthcoming (2013)
19. The Nexus between Openness and Economic Growth: Evidence from a Multivariate Panel  
VAR Model By Pradhan R P *Finance India* Forthcoming (2013)
20. Validating a Conceptual Model of Service Quality in Technical Education By Jain, R.,  
Sahney, S. and Sinha, G. *Asian Journal of Quality* Vol.14, No. 3, 1-20 (2013)
21. Winners and Losers in M&A Game: Evidence from Manufacturing Companies in India By  
Leepsa NM & Mishra Chandra Sekhar *Journal of Management Research* Vol.13-4, pp.196-  
208 (2013)

***Papers Presented in Conferences***

1. “Improving Effectiveness Of Customer Loyalty Programs: A Case Study on a Large Retail  
Chain in the Indian Context,□?”, By Sahney, S., *International Conference of Technology and  
Business Management, INFOMS*, American University of Emirates, Dubai, (2014)
2. Energy-Growth Nexus: Evidence from a Panel of ASEAN Regional Forum Countries, By  
Pradhan R P, *Green Energy for Sustainable Development*, Thailand, (2014)

## Alumni Affairs & International Relations

### Dean of Alumni Affairs & International Relations

Prof. Siddhartha Mukhopadhyay, Electrical Engineering

### Managing Director, Institutional Development (ID) Program

Chinna Boddipalli

### Institutional Development Program

Shreyoshi Ghosh

Shruti Gupta

Anupam Sarkar

Anirban Roy

Pushkar Srivastava

Arnab Das

### Office of Dean of Alumni Affairs & International Relations

Shampa Goswami

Prasenjit Banerjee

Sadhan Banerjee

### Technology Alumni Association, Kharagpur

Dr. Dilip Nanda, Computer Informatics Centre – Secretary and Officiating President

Prof. Kajal Biswas, Mechanical Engineering – Joint Secretary

Prof. Joy Sen, Architecture & Regional Planning – Treasurer

### Alumni Affairs

**Present Activities and Achievements:** Alumni Connectivity, Communications and Publications, Branding, Fundraising, Events Management

**Connectivity:** The number of alumni connected by various means to IIT Kharagpur has been increased through active efforts during this year. The present status of connectivity is given below.

Platform	Present Count
IIT-KGP Alumni Portal	10,710 alumni registered – up from 8000
Mass Mail to Alumni	36,500 (email count) – up from 23000

LinkedIn University Page Reach	32,020 alumni connected – up from 12000
Facebook Page Reach	76336 Reach (alumni + non-alumni) – up from 1000

**Communications:** Communications are made through mass mailing and postings at the web portal and the social media such Facebook, LinkedIn and YouTube.

**Mass Mailing:** Effective Institute-Alumni communication has been maintained through mass mails to alumni, students, faculty members, retired faculty members and parents to update them regularly about the Institute news and developments. The various modes of Institute communication are as follows:

- KGP Connection, an online fortnight newsletter
- Seasonal Greetings
- Various fund-raising campaigns update

**Web Portal:** Web portal is updated on a fortnightly basis and also on-demand. Till the financial year which is being reported the portal was managed by Eklavya Creations. Following facilities are provided - news and events announcements, online donation, events registration, job portal, emailing facility

**Social Media:** Regular posts are made on Facebook and LinkedIn. Also Videos uploaded on YouTube and circulated through available channels.

**Publications:**

1. Annual and quarterly print publications help exchange of news and stories among alumni, students and faculty. Among these are KGPIan and Yearnings of Yore.
2. The Alumni Annual Report is the initiative of ID Program which includes information about fundraising initiatives, donors and its beneficiaries, new projects in the Institute etc.

**Branding:**

**Public Relations:** PR coverage was done for various events, R&D and happenings at the Institute. On an average 2 articles were published every month with one or more of 20 print media house (English, Hindi, vernacular) with total number of insertions being at 76 for the FY 2013-14. Among these the news which got maximum coverage were Convocation 2013, 1000+ Placement by Training & Placement in the first phase and R&D projects of Food in a Tube.

**Ranking – Gathering Data for Metrics and Benchmarking:** Data is being submitted annually for domestic and international ranking to the two top international ranking agencies such Times Higher Education, QS. Also submitted to national ranking agencies such as Outlook, India Today, Dataquest, The Week, GHRDC

**Brand Merchandising:** Brand Merchandising is being managed by the Office round the year and made available to the alumni, faculty, students and other visitors. Merchandise is sold during the events like Convocation, Alvida and Annual Alumni Meet. Space for has been allocated at the newly

renovated Technology Students Gymkhana to sell branded souvenirs of IIT-KGP. In order to make this effective the Institute has already trademarked its logo and brand name.

**Yearbook and Alumni Card:** Yearbook and Alumni Card are being distributed to all passing out students during Convocation. Those who could not come for the Convocation these were sent to them along with their degree certificates. More than 2000 students in 2012-13 received the Yearbook and Alumni Card.

### **Fund Raising**

**Founding Endowment Batch (Grass roots) campaign:** This campaign is for alumni across all the batches to donate for their respective batches and a classroom when they reach the minimum target of INR 50lakhs. In the current financial year 2013-14, the batch of 1984 has become the Super Endowment Batch by raising more than INR 1 crore and the batch of 1970 is in the process of claiming the 2<sup>nd</sup> position. 1968 and 1975 batches too have become Founding Endowment batches by raising INR 50 lakhs each.

**My Imprint:** This program facilitates the final year students to give back to their Alma Mater by contributing their caution money and a part of their annual earning. Class of 2013 has raised about INR 18 lakhs through 'My Imprint Program' in support of creating KGP Endowment for students' services.

**Other Campaigns:** Among the other campaigns being run or introduced are Vision 2020 Annual Donors and Parents Campaigns. A new campaign which was introduced was Corporate Fundraising through their CSR programs and Microsoft India Development Center was the first donor. It funded the R&D project by Prof. Chandan Chakraborty, School of Medical Science& Technology IIT Kharagpur on Medical Imaging Informatics for Skin Wound and Malaria Screening.

**Shri Gopal Rajagarhia International Programmes** - Shri Gopal Rajagarhia (B.Tech./ CH/ 1968)facilitated launching of the international program along with few other student programs with the seed endowment funding of INR 10 crores of which he has donated INR 3 crores. IIT Kharagpur proposes to create an Endowment Fund, with monetary contributions to be made by Shri Rajagarhia family, which would be utilized towards activities of the “**SHRI GOPAL RAJAGARHIA INTERNATIONAL PROGRAMMES AT IIT KHARAGPUR**”. These programmes shall be designed to support international exchange of faculty and students.

### **Events Management**

**Foundation Day:** The Office of Dean (AA&IR) along with Technology Students' Gymkhana organized this day-long event on August 18<sup>th</sup>, 2013. This year the Nina Saxena Excellence in Technology Award in the memory of alumna and scientist Dr. Nina Saxena (1992/B.Tech/ECE/SN) was given jointly to two teams viz. STREE, a wing of National Service Scheme (NSS) IIT Delhi which works in the areas of women empowerment for developing an android app called “SAFE HANDS” and the Desalination Division, Bhabha Atomic Research Centre, Trombay, Mumbai for developing Hybrid membrane technology for removal of uranium from ground water. The Foundation Day lecture was delivered by distinguished alumnus Dr. Amit Chatterjee (1984/B.Tech/ECE), General Manager for the Visual Studio Team Test Business at Microsoft, India. The lecture was followed by a lively interactive session between the Director and a group of school students from Kolkata organized by alumnus Rajiv Agarwal.



**Alvida:** This is the annual farewell event for outgoing students which was organized by Technology Alumni Association, Kharagpur Chapter in association with the Office of Dean (AA&IR) on 2nd April 2013. Alvida '2013 had an overwhelming participation of over 2800 students.

**Institute Lecture Series (2013-2014):**

- Prof. Kunal Basu, Said Business School, University of Oxford, UK on Engaging with Society: A Campus View
- Prof. D. D. Sarma, Solid State and Structural Chemistry Unit, IISc, Bangalore on Nanoscience and Technology with an emphasis on Photoluminescence from semiconductor nanocrystals: Beyond the obvious
- Dr. Bijoy Chatterjee, Director, University Relation, Texas Instruments on 'Prospects of Students in Semiconductor Industry'
- Mr. Kumud Srinivasan, President, Intel India on 'Launch of Intel IEC, 2014&Technology'
- Prof. Sarit Kumar Das, Dean R&D, IIT Madras
- The Office also provides logistic support to the Spiritual Heritage Lecture Series organized every Wednesday during Semesters

**Convocation:** The Office provides various logistic support towards Convocation registration and awarding of the Distinguished Alumnus Awards.

**Distinguished Alumnus Awards 2013**

- Aditi Chattopadhyay (1980/B.Tech/AE)
- Aniruddha Ray (1966/B.Tech/EE)
- Devinder Kumar Gupta (1964/B.Tech/AG)
- Jay Chatterjee (1958/B.Arch/AR)
- K.G Narayanan (1964/B.Tech/EC)
- Kamal Kumar Sarbadhikari (1964/B.Tech/ME)
- Keshab K. Parhi (1982/B.Tech/EE)
- Parimal Kanti Bharadwaj (1974/M.Sc/CY)
- Rabindra Nath Nayak (1980/M.Tech/EE)
- Somnath Ghosh (1980/B.Tech/ME)

**Memoranda of Understanding:** The Institute signed the following MoUs during the period April 2013 – March 2014

i)	MoU between MCX Stock Exchange Limited, Mumbai and VGSOM, IIT Kharagpur	Signed on 22.01.2013 Validity: 3 years
ii)	MoU with Rhein-Waal University of Applied Sciences, Germany	Signed on 27.02.2013 Validity: 5 years
iii)	MoU with International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad	Signed on 06.03.2013 Validity: 5 years
iv)	MoU between IIT Kharagpur and Leibniz-Institut Polymerforschung, Dresden, Germany	Signed on 06.03.2013 Validity:

v)	Cooperation agreement between IIT Kharagpur and The University of British Columbia Applied Science	Signed on 25.03.2013 Validity: 5 years
vi)	MoU with the Governors of The University of Alberta, Edmonton, Alberta, Canada	Signed on 04.04.2013 Validity: 5 years
vii)	Institutional Collaboration Agreement with National Taiwan University of Science and Technology, Taipei, Taiwan, ROC	Signed on 28.06.2013 Validity: 5 years
viii)	Agreement with Moscow State Mining University, Moscow, Russia	Signed on 27.06.2013 Validity: 5 years
ix)	MoU with Confederation of Indian Industry (CII), Eastern Region, Kolkata	Signed on 19.09.2013 Validity: 3 years
x)	MoU with Tata Medical Centre (TMC), Kolkata	Signed on 24.09.2013 Validity: 5 years
xi)	MoU with University of Dublin, Ireland	Signed on 01.11.2013 Validity: 5 years

### International Relations

**Present Activities:** Exchange Program and Facilitation of Visitors (Inbound and Outbound)

**Exchange Programs:** As per MoU, the Institute permitted the following students to undergo academic courses/internship at IIT Kharagpur during April 2013 – March 2014

Name of the University	Name of the student (s)	Duration of visit
Polytech Lille, France	Ms. Fanny Tissot Ms. Julie Deschamps	Dept. of Agricultural & Food Engineering 01.05.2012 – 31.07.2012 Postgraduates
University of California, Berkeley	Ms. Katherine He Ms. Ramya Prathuri Ms. Akshita Dutta Mr. Jay Patel Mr. Rohan Jonnalagadda	Dept. of Chemical Engineering & Dept. of Electrical Engineering 16.06.2012 – 12.08.2012 Undergraduates
Technische Universität, Darmstadt, Germany	Ms. Judith Elin Vesper	Dept. of Mechanical Engineering 18.07.2012 – 30.04.2013 Postgraduates
Leibniz University, Hannover, Germany	Mr. Tim Federmann	Dept. of Architecture & Regional Planning August 2012 – July 2013

		Postgraduates
Virginia Commonwealth University, USA	Mr. Demetrius Adams Mr. Joshua Monday Mr. David Tchao Ms. Abigail McFarland	06.01.2013 – 11.01.2013 Undergraduates

**Outbound Exchange:** They are 3<sup>rd</sup> year B.Tech. students from Mechanical Engg. Dept., selected by the Warwick Manufacturing Group, University of Warwick, United Kingdom under the IIT Kharagpur-University of Warwick MoU for eight weeks summer internship at Warwick in the summer of 2013.

Roll No	Name	Dept.
10IM30026	Srikar Settur	IM
10IM10010	Ashif Sikandar Iquebal	IM
10MF10007	Ayan Hazra	ME
10ME10059	Suhas Maji	ME
10MT10002	Ajaya Pratap Jena	MT
10MT10012	Dheeraj P.R.	MT

**Visits:** Faculty members from the Institute visit to various international universities such as Tokyo, Wollongong, Alto, Southampton. The Office provides data of alumni and relevant contacts located at the places visited by the faculty. Also visitors from reputed international universities and research organizations visit the Institute during the year many among whom are alumni. Some such universities are Leibniz, Stuttgart etc. The Office provides all necessary logistic support towards such visits.

## Central Library

The Central Library, IIT Kharagpur is one of the largest technological libraries in Asia, which is fully automated and facilitates more than 10,000 users from students, research scholars, faculty and staff of the Institute. Its website address is <http://www.library.iitkgp.ernet.in> .

<b>1.</b>	<b>ACADEMIC STAFF:</b>
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### Chairman

Professor S. Chattopadhyay                      Ph. D (IIT-Kharagpur), MURP (SPA Delhi), B.Arch  
(Calcutta), Cert. Housing (Newcastle, UK), Dip.  
Housing (Lund, Sweden), AITP, Housing, Urban  
Planning and Building Materials.

### Librarian

Sutradhar, B    Ph. D, M.Sc., M Lib.I.Sc., C.C.A

### Assistant Librarians

Shankar, U    M Lib.I.Sc., M.A

Mazumdar, K    Ph. D, M Lib.I.Sc., B.Com, CPDA

Nandi, A     M.Lib.I.Sc., M.Sc.

<b>2.</b>	<b>RETIREMENT:</b>
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Mr. Dulal Kumar Chanda, Senior Technician, retired on May'2013

Ms. Dipali Adak, Assistant Library Information Officer, retired on June'2013

Mr. Arun Kumar Das, Senior Technician, retired on July'2013

Mr. Ramanuj Pal, Senior Technician, retired on December'2013

Ms. Sima Rani Pal, Senior Attendant, retired on March'2014

<b>3.</b>	<b>PRINT AND ELECTRONIC COLLECTION ADDED DURING 2013-14</b>
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Books/ e-Books			Journals/ e-Resources		
General	Text Books	e-Books (database)	Print	Only Online	e-databases
1520	1416	00	20	1337	20

<b>4.</b>	<b>NEW JOURNALS/ E-DATABASES ADDED DURING 2013-14</b>
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**Journals:**

- 1 Journal of Astronautical Sciences (PR)/American Astronautical Society
- 2 International Journal of Energetic Materials & Chemical Propulsion (OL)/BEGELL House
- 3 Agronomy Journal (OL)/ American Society of Agronomy
- 5 Traditional Dwelling and Settlement Review (PR)/IASTE
- 6 International Journal of Innovation & Regional Development (OL)/Inderscience
- 7 Open House International (OL)/ Open House International Association
- 8 Journal of Bacteriology (OL)/ American Society of Microbiology
- 9 Journal of Biological Chemistry (OL)/ American Society of Microbiology
- 10 Microbiology (OL) / Society for General Microbiology
- 11 International Journal of Environment & Waste Management (OL) / Inderscience
- 12 International Journal of Environment Technology and Management (OL)/ Inderscience
- 13 Canadian Geotechnical Journal (OL) / NRC Research Press
- 14 Canadian Journal of Civil Engineering (OL) / NRC Research Press
- 15 Geotechnique (OL) / Thomas Telford
- 16 Journal of Chemical Education (OL) / American Chemical Society
- 17 Journal of Chemical Engineering of Japan (OL) / JCEJ
- 18 Journal of Aerospace Information Systems (OL) / AIAA
- 19 Journal of Micromechanics and Microengineering. (OL) / Institute of Physics
- 20 Control and Intelligent System (OL) / Acta Press

- 21 International Journal of Modelling, Identification & Control (OL) / Inderscience
- 22 RSC Gold Package (48 titles) (OL) / Royal Society of Chemistry
- 23 SPIE Digital Library ((10 titles) (OL) / SPIE
- 24 World Scientific Journals Package (10 titles) (OL) / World Scientific
- 25 AIR Law College (12 titles) (PR & OL) /All India Reporter Pvt. Td.
- 26 Indian Bar Review (PR) / Bar Council of India
- 27 International & Comparative Law Quarterly (OL) / Cambridge University Press
- 28 Corporate Law Adviser (PR) / Corporate Law Adviser
- 29 International Journal of Corporate Governance (OL) / Inderscience
- 30 Annual Survey of Indian Law (PR) / Indian Law Institute
- 31 Journal of the Indian Law Institute (PR) / Indian Law Institute
- 32 Indian Journal of Criminology and Criminalistics (PR) / Inst of Criminology and Forensic  
Science
- 33 Criminal Law Review (OL) / Sweet & Maxwell
- 34 Law Quarterly Review (OL) / Sweet & Maxwell
- 35 Annals of Mathematics (OL) / Mathematical Science Pub
- 36 Journal of Thermophysics and Heat Transfer (OL) / AIAA
- 37 Bone and Joint Journal (The) (PR) / Bone and Joint
- 38 Journal of Bone and Joint Surgery (The) (PR) / Bone and Joint
- 39 Smart Materials and Structures (OL) / IOP
- 40 International Journal of Mining and Mineral Engineering (OL) / Inderscience
- 41 Journal of Explosive Engineering (OL) / Intl. Soc. Of Explosive Eng.
- 42 European Journal of Mineral Processing and Environmental Protection (OL) / Minerals  
Engineering International
- 43 Asia Miner (The) (OL) / Mining Media Internaional
- 44 Transaction of the Society for Mining, Metallurgy and Exploration (OL) /SME
- 45 Lasers in Engineering (OL) / Old City Pub. House
- 46 International Shipbuilding Progress (OL) / IOS Press

- 50 Kautschuk, Gummi, Kunststoffe (OL) / Huthig GmbH
- 51 Polymers and Polymer Composites (OL) / Smithers Rapra
- 52 Paediatrics (OL) / American Academy of Paediatrics
- 53 Circulation (OL) / Lippincott Williams and Wilkins
- 54 Journal of the American Medical Association (OL) / American Medical Association
- 55 Annals of Surgery (OL) / Lippincott Williams and Wilkins
- 56 Health Affairs (OL) / Project HOPE
57. Taylor & Francis Science & Technology and Social Science Package (1201 titles)
58. Nature Journals Package (30 titles)

**E-databases:**

- 1 ACP Journal club / American College of Physicians
- 2 PsycARTICLES / American Psychological Association
- 3 BIS Standard (updated) / Bureau of Indian Standards
- 4 Bloomberg Data Services / Bloomberg
- 5 CMIE Databases (Prowess, CapEX, Industry Outlook & Economic Outlook) CMIE
- 6 SCC Online (Platinum Plus) / Eastern Book Company
- 7 Technical Insights / Frost and Sullivan
- 8 [www.energylineindia.com](http://www.energylineindia.com) / [Indianpetro.com](http://Indianpetro.com)
- 9 Turnitin2 – – Anti Plagiarism Web Tool (for 1000 users) / iParadigms, LLC
- 10 ISO Standards (Complete) / ISO
- 11 Project Muse / John Hopkins Univ Press
- 12 Wiley Journals Archives (Core Collection) / John Wiley
- 13 Synthesis Lectures on Computer Science (Collection#1) / Morgan & Claypool Publishers
- 14 Springer Materials (Archives) / Springer
- 15 Springer Protocols (Archives) / Springer
- 16 Thieme Journals Archive (Synlett & Synthesis) / Thieme Pub
- 17 Mobility in Cities Database / UITP
- 18 SciFinder Academic Unlimited Access Plan / Chemical Abstracts Services

- 19 IEC Standards / IEC
- 20 Nature Publishing Journals / Nature Publishing Group, UK

<b>5.</b>	<b>INDEST-AICTE CONSORTIUM</b>
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As a core member of INDEST-AICTE Consortium, Central Library has been availing of access to all the full-text databases, electronic resources subscribed by the consortium. This year the facility has been come down due to inadequate budget of the consortium and some of the electronic resources have been subscribed by the member institutions as per negotiated price of the consortium.

<b>6.</b>	<b>BOOK FAIR</b>
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Since 1999, the Central Library of IIT Kharagpur has been organizing Technology Book Fair every year to support the information needs of IIT Kharagpur community. The fair can reasonably claim a special status in being the only one of its kind in the area of Science and Technology organized by an educational institution in this country. As a window on the frontier less world of books in diverse fields of thought, the fair gives us an opportunity to update and enlarge our vistas of knowledge.

The 9th Technology Book Fair-2014 was held during the period from 7-10 January 2014 at Vikramashila New Complex (Adjacent Kalidas Auditorium). Prof. Kunal Basu, currently at Said Business School, University of Oxford and an eminent writer as Chief Guest had inaugurated the Book Fair on 7th January 2014 at 11:30 A.M. There were 40 Book suppliers/publishing agencies participated in the 9th Technology Book Fair-2014.

A series of workshop viz a) Know your e-sources at Central Library and its access b) Turnitin anti-plagiarism web tool training session c) Get the best from SciFinder and its new features d) Web-Scale discovery services: Single window access to Library e-resources were organized by the Central Library.

<b>7.</b>	<b>WORKSHOPS / SEMINARS</b>
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**Central Library has organized a number of workshops during the year:**

- i) Workshop on “Springer Materials & Springer Protocols” in Digital Library on 26 June 2013 organized by Central Library and sponsored by M/s Springer (India) Private Ltd. About 75 participants from the research scholars and students of the Institutes were attended in the workshop.
- ii) Workshop on “Publishing Connect” in Annex Building of the Central Library on 25 November 2013 organized by Central Library and sponsored by M/s Elsevier (India) Private Ltd.. About 180 participants took part in the Workshop.
- iii) Workshop on “Author Workshop” in Netaji Auditorium on 12 February 2014 organized by Central Library and sponsored by M/s Springer (India) Private Ltd. About 550 participants from the faculty members, research scholars and students of the Institutes were attended in the workshop.



- iv) Workshop on Open Source Software for Library Management”, 3-7 June 2013, organized by Central Library, IIT Kharagpur. 60 participants from all over India were participated in the woerkshop.

<b>8.</b>	<b>NEW LIBRARY SERVICES FOR THE USERS</b>
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24 X 7 hours library facilities for 15 days during Semester Examinations of the undergraduate students.

### **1. Digital Library Services**

No. of Document Delivery Services : 44 out of 70

No. of Turnitin Anti Plagiarism Services

a) Student id : 309

b) Instructor id : 153

c) Report delivered : 22

No. of JCPDS Software Services : 153

No. of Book Accompany CD delivered : 48

No. of Ph. D. Theses digitized : 583

### **2. Circulation Section**

Circulation Section is the gateway between users and document. Sop it plays a major role to any library and information system. Circulation Section performs issue, renewal and return of books using the library management software LibSys. Apart from this basic task, many other jobs like membership registration, issue of no dues certificate, inter library loan service and overdue fine collection, book reservation, various e-mail alert generations, etc. and entertaining all kinds of queries are being performed by this section. Central Library Circulation Section is kept open for 63 hours a week.

### **3. Institutional Digital Repository**

Central Library has developed an Institutional Digital Repository (IDR) using open source software namely DSpace. The IDR collects, preserves and disseminates in digital format of the research output (Ph.D theses, Technical Reports, Faculty Publications, etc.) within IIT Kharagpur Research Community. It enables the Institute community to deposit (self archiving) their preprints, postprints and other scholarly publications using a web interface and organize these publications for easy retrieval. At present, the access of IDR is restricted within the IIT Kharagpur campus LAN only.

### **4. Renovation Works**

Central Library Seminar Room has been renovated to a modern sophisticated sound proof Seminar Room with a seating capacity of 120 participants.

**5. Facilities created for library users**

24 x 7 hours reading room facility has been introduced for 15 days during Semester Examinations of the Undergraduate Students.

## Central Research Facility

### Chairman

Prof. Rahul Mitra, MME Materials Science Division

Prof. Ananta K. Ghosh, BT, Life Science Division (01-04-2013 to 30-11-2013)

Prof. Amit Kumar Das, BT, Life Science Division (01-12-2013 onwards)

### Associated Faculty

Prof. A. Basak,	- In charge, CD Polarimeter
Prof. M. Bhattacharjee	- In charge, EPR
Prof. S. K. Srivastava	- In charge, ESCA
Prof. S. K. Ghosh	- In charge, FACS
Prof. S. K. Pabi	- In charge, XRD, HRXRD
Prof. J. Dutta Majumder	- In charge, FE-SEM
Prof. B. Adhikari	- In charge, FTIR
Prof. T.K. Nath	- In charge, Hall Effect
Prof. R. Banerjee	- In charge, HPLC
Prof. Rahul Mitra	- In charge, HRTEM
Prof. K.K. Ray	- In charge, UTM (Instron)
Prof. A.K. Das	- In charge, MALDI, XRD (Protein Crystallography)
Prof. S. Das Gupta	- In charge, ITC
Prof. T. Pathak	- In charge, Mass Spectrometer
Prof. S.B. Singh	- In charge, OES
Prof. J. Dutta Majumder	
Prof. K. Biswas	- In charge, Optical Microscopy
Prof. P. Roy Chowdhury	- In charge, Optical Fiber
Prof. A.K. Ghosh	- In charge, PCR, 2-D Gel. DNA Sequencer
Prof. R. Mitra	- In charge, SEM
Prof. C. Jacob	- In charge, SPM

Prof. S. Das	- In charge, TEM
Prof. K. Das	- In charge, Thermal Analysis
Prof. S.H. Dey	- In charge, LC-MS/MS
Prof. V. Adyam	- In charge, SQUID
Prof. A. Roy	- In charge, Raman Spectrometer
Prof. T. Laha	- In charge, Nanoindentation & Nanotribology

### Senior Scientific Officers

Ph. D. (IIT Kharagpur), Experimental & theoretical condensed matter physics.

M.Sc., Ph. D. (IIT Kanpur), Inorganic Chemistry, Scanning Electron Microscopy and Metal Matrix Composites

### Brief descriptions of on-going activities

#### Life Science Division

1. **2D GEL Laboratory:** Two-dimensional gel electrophoresis system: this equipment is used for analyzing protein samples (qualitative and quantitative) provided by investigators (students, scholars and faculty of the department of Biotechnology, SMST, and ALPGE).
2. **DNA Sequencer; Real time Polymeric Cyclic Reaction (PCR) analyzer, 2- Dimensional gel electrophoresis Laboratory:** This equipment is use to determine nucleotide sequence of DNA samples provided by different investigators (students, scholars and faculty of the department of Biotechnology, SMST, ALPGE and AgFE).
3. **Real Time PCR machine Laboratory:** this machine is used to analyze gene expression level (quantitative) in different tissue samples provided by investigators (students, scholars and faculty of the department of Biotechnology, SMST, ALPGE).
4. **FACS Laboratory:** the BD FACSCalibur™ system is four-color, dual-laser, bench top system capable of both cell analysis and sorting. This machine is designed specifically to support a wide range of applications like immunophenotyping, absolute counting, residual white blood cell enumeration, stem cell analysis and isolation by sorting. Recent Experiments carried out with this instrument include drug delivery, detection of apoptotic cell death by TUNEL Assay, interaction between cell and fluorescent labeled toxin molecules, and cell cycle analysis.
5. **High Pressure Liquid Chromatography Laboratory:** HPLC is an efficient technique used for the separation of macro/micro molecules such as organic compound, amino acids, nucleotides, aroma/fragrance, enzymes and proteins etc. this equipment has quaternary pumps, along with different detectors like Refractive Index (RI) and Photo diode array at variable wavelengths, manual injecting valves, ports as well as various columns for separating different molecules.
6. **MALDI-ToF Laboratory:** Matrix Assisted laser Desorption Ionization (MALDI)- Time of flight (ToF) mass spectrometry is used for mass analysis of polymers, proteins and other small molecules (>500Da),. As well as for biomarker identification of different species.
7. **Protein Crystallography: Protein X-ray Crystallography (PX) Laboratory:** Rigaku Micromax 007<sup>HF</sup> X-ray generator is equipped with RaxisIV++ detector and X-steam cryo for X-ray diffraction studies of protein crystals to determine their 3D structure in atomic resolution.

Three dimensional structures of proteins from pathogenic organisms like *M. tuberculosis* and *S. aureus* have been determined.

8. **Isothermal Titration Calorimetry (iTC200 Systems):** iTC200 is used for characterization of molecular interactions of small molecules, proteins, antibodies, nucleic acids, lipids and other biomolecules. Enzyme kinetics, assessment of the effect of molecular structure changes on binding mechanisms, assessment of biological activity are also possible. Direct measure of sub-millimolar to nanomolar binding constants ( $10^2$  to  $10^9$  M<sup>-1</sup>) and measurement of nanomolar to picomolar binding constants ( $10^9$  to  $10^{12}$  M<sup>-1</sup>) using the competitive binding technique.

### Materials Science Division

1. **Field Emission Scanning Electron Microscope Laboratory:** the field emission gun assisted scanning electron microscopy (FE-SEM, Supra 40V, Carl Zeiss, Germany) provides an excellent scope of microstructural characterization using secondary or back scattered imaging, energy dispersive spectroscopy and electron back scattered diffraction analysis. The samples analysed include various metals and alloys, semi-conducting and insulating films, refractories, polymeric and ceramic powders, failed engineering components and hybrid/composite materials.
2. **FTIR Laboratory:** FTIR analysis of different samples in powder, liquid and also film form in MID-IR and FAR-IR range are done at both ambient and above ambient temperatures by our institute students and faculties.
3. **Hall Effect Laboratory:** Electrical resistivity (conductivity), Magnetoresistance and Hall voltage measurements of metals, semiconductors, oxides, heterostructures, etc. Are carried out in the temperature range of 10 – 300 K by employing a closed cycle Helium refrigeration cryostat in the magnetic field range of -10 kOe -0 -+10 kOe. The magnetoresistance and Hall measurements employing a Vander Pauw four probe technique are also used for characterization of materials like magnetic oxides, spintronic materials, nanometric materials, spin sensor material, magnetic multilayers, semiconducting materials, etc.
4. **High Resolution Transmission Electron Microscope Laboratory:** The HRTEM laboratory is equipped with the JEOL JEM-2100 High Resolution Transmission Electron Microscope, OXORD INCA EDS microanalytical system and GATAN CCD camera. This instrument is used for observation of specimens to observe the microstructures at high resolution, up to the level of arrangement of atoms, and determination of the crystal structure defects and grain sizes as well as chemical composition at selected positions. In metals, ceramics, polymers rubbers and semiconductor. The machine is routinely used for research on nano-structured materials, bulk alloys, thin films powders, and composites. In addition, it is possible to study phase transitions at low temperatures using the specimen holder operating at the liquid nitrogen temperature.
5. **Optical Emission Spectrometer Laboratory:** Optical emission spectrometer (Model No. ARL 3460) is used for very fast, reliable and accurate analysis of chemical composition. In this machine, the energy coming out from a spark formed between sample and an electrode is converted into a spectral pattern, which is used to analyze the presence of element and its quantitative analysis (from the intensity of spectrum).
6. **Optical Fiber Laboratory:** The research in this laboratory is based on design, fabrication and analysis of microstructured optical fiber. The optical fiber perform fabrication unit mainly consists of optical lathe machine, real time monitoring system for temperature and gas flow controller, movement/speed controller of the mechanical stack-holding assembly, and the flame-brush unit. The accessory units like nitrogen plant, chiller plant are integral part of the system.
7. **Scanning Electron Microscope (SEM) Laboratory:** The SEM laboratories are equipped with 1) JEOL JSM-5800, 2) ZEISS EVO-60 Scanning Microscopes. The analytical attachments with these instruments are OXFORD ISIS-300, INCA Energy-250 EDS systems, INCA Wave-500

WDS system and HKL Channel-5 EBSD system. The projects associated with the instrument are aluminium alloys, In-situ composites, failure analysis of materials, Biomaterials, Nanostructured materials, Microalloyed steel, Laser surface alloying, Cutting tool materials, Functionally graded materials, Intermetallics, Rubber and Polymer based composites, Ceramic materials etc.

8. **Scanning Probe Microscope Laboratory:** A wide variety of samples have been examined using the Scanning Probe Microscope in the last year. These include metals, polymers semiconductors, nanomaterials, etc.
9. **TEM Sample Preparation Laboratory:** This laboratory provides services for preparing samples of different types of TEM study using instruments like cryo-ultramicrotome jet polisher, and precision ion polishing system (PIPS) etc.
10. **Thermal Analysis Laboratory:** The thermal analysis laboratory I equipped with Differential Scanning Calorimeter (DSC), Thermo-gravimetric and Differential Thermal Analyzer (TE-DTA) and Thermo Mechanical Analyzer (TMA). The DSC is being extensively used to study the thermal stability of nanocomposites, glass transition temperatures of polymeric materials, and curing of polymeric materials. The recent works of significance done with the TG-DTA system include the evaluation of thermal stability of polymer nano composites, TG studies have been carried out on the calcinations of aqueous combustion synthesized metal oxide powders, analysis of reactions towards formation of new ceramic compounds, effect of mechanical milling on the reaction onset temperature of aluminium based nano composites, etc. The TMA is being used to study the sintering behavior of nano composite materials as well as to determine the thermal expansion coefficients of some newly developed materials.
11. **X-ray Diffraction Laboratory:** X-ray diffraction (XRD) facility includes three units: PW Philips 1710, Expert PRo I and Expert PRo II. While the first unit is used for routine powder diffraction studies, Expert PRo I is dedicated to texture and residual stress analysis and high temperature XRD. Expert PRo II unit is utilized for powder diffraction at normal and high resolution and low angle incidence mode. These units are extensively used to conduct phase analysis and identification, crystallite size determination, plastic strain measurements, texture evolution, surface residual stress measurements, phase transition studies (ex situ and in situ), volume fraction determination and failure analysis of engineering components.
12. **Circular Dichroism (CD) Spectrometer Laboratory:** Circular Dichroism (CD) J-810-150-S Model, 150W air-cooled Xenon Lamp, Head-on photomultiplier tube, 163-900 nm measurement range Circular Dichroism (CD) is observed when optically active matter absorbs left and right hand circular polarized light slightly differently. It is measured with a CD spectropolarimeter. The instrument needs to be able to measure accurately in the far UV at wavelengths down to 190-170 nm. The difference in left and right handed absorbance  $A(l)-A(r)$  is very small (usually in the range of 0.0001) corresponding to an ellipticity of a few 1/100th of a degree. The CD is a function of wavelength. It has become a powerful tool to analyze the structure of biomolecules and their interaction with various ligands. Changes in the CD spectra reflect a perturbation in the structure of biomolecules brought about by changes in conditions like temperature, pH or drug binding. Protein folding/unfolding can be followed by changes in the CD spectra. Stereochemistry of products through enzymatic reactions is also an important activity of CD spectroscopy, which is related to the 3D-structure of the active site of an enzyme. Stereochemistry of products through enzymatic reactions is also an important activity of CD spectroscopy, which is related to the 3D-structure of the active site of an enzyme.
13. **Mass Spectrometer Laboratory:** Mass Spectrometer LCT is a compact, fully integrated, computer controlled, high performance, orthogonal acceleration Time-of-Flight (oa-TOF) Mass Spectrometer that can be configured for a wide range of LC-MS applications. It provides both exact molecular weight (HRMS) and structural information (LRMS) for characterization of

mainly organic compounds and some organometallic compounds and metal complexes with excellent sensitivity. Both synthesis and elemental confirmation can be obtained that is essential for the support of patent applications or for the submission of data to scientific journals. The types of projects on which the equipment can be associated with are based on Synthesis Confirmation, Elemental Confirmation, Structure of Natural Products, Drug Discovery, Supramolecular Interactions/Drug-Receptor Interactions, and Environmental Monitoring. The equipment has been rendering extremely valuable service since its inception to the users within IIT, Kharagpur and external users from various academic institutes, R & D laboratories and industries.

14. **SQUID VSM Laboratory:** The Quantum Design MPMS SQUID VSM EverCool system features an integrated pulse-tube cryocooler-dewar system. This eliminates the need to use any liquid cryogens for the operation of the MPMS SQUID VSM. It offers  $1 \times 10^{-8}$  emu sensitivity with fast data acquisition. A maximum DC magnetic field up to 7T in temperature range 2-1000K is available in both DC and AC magnetization measurements. Information about hysteresis loops, relaxation times, magnetic field and temperature dependence of magnetic moment can be obtained. Magnetic properties of broad range of samples related to materials, geological and biological can be analysed.
15. System Model No:- SVSM-EC, Serial No. SMT 043
16. **Transmission Electron Microscope Laboratory:** Transmission Electron Microscope with ability to study structure and composition is being procured. The chosen electron microscope is operated at acceleration voltages up to 200 kV. The machine is equipped with high tilt specimen stage, which is essential for examination of structural defects in materials. It will be possible to study specimens using bright and dark field imaging, selected area diffraction, convergent beam electron diffraction and energy dispersive spectroscopy. The Energy Dispersive X-Ray Analyzer provided with the transmission electron microscope will be able to detect element composition, both qualitatively and quantitatively. The CCD Camera records images on high resolution transmission electron microscope electronically. The accompanying softwares are going to be used in analyses of images. Model FEI-TECNAI G2 20S- TWIN.
17. **Raman Spectrometer Laboratory:** Raman spectroscopy is an efficient non-destructive tool, which provides enormous information on various physical properties of new state of art materials. The Triple Raman Spectrometer, T64000 from Jobin Yvon, Horiba, France, is equipped with Ar-Kr ion laser (with 10 laser lines) as an excitation source, a triple monochromator and a CCD detector (1024×256 pixels). It has a capability to reject Rayleigh line to a very high extent for all 10 laser lines. Hence, using this instrument one can record spectra from as low as  $2 \text{ cm}^{-1}$  Raman shift. Other than material characterization, it can be used for resonance Raman measurements and acoustic phonon measurements.
18. No tool-specific sample preparation is required for the measurements. The incident radiation can directly interact with the sample. The system works for all types of sample, solid (powder or crystalline), liquid and gas.
19. **Nanoindentation & Nanotribology Laboratory:** The nanoindenter with nano-tribological testing facility (*TI 950 TriboIndenter, Hysitron Inc., USA*) in the “Nanoindentation & Nanotribology Laboratory” at Central Research Facility in IIT Kharagpur is a Nanomechanical characterization instrument with in-situ SPM (Scanning Probe Microscopy) imaging, facility, through which mechanical properties like hardness, Young’s modulus, stress-strain behavior, creep indentation fatigue resistance and fracture toughness of thin films, coating, individual phases in a multiphase alloy, composites and soft biological tissues can be studied. The instrument is capable of carrying out various mechanical testing operations in nano -scale as well as in micro-scale, owing to its dual head testing capability. The various mechanical testing could be carried out at higher temperature (up to 400°C) also. Integrated with low-noise three-plate capacitive transducers and

electronics, the multi-layered enclosure and active vibration isolation system provide excellent environmental separation for the instrument.

20. **High Resolution Mass Spectrometry Laboratory:** Mass Spectrometer Model Xevo G2 QT of Waters UK Ltd. The Xevo G2 QToF Mass Spectrometer is a highly sensitive, exact mass bench top system. The instrument is equipped with a T-wave collision cell and with a orthogonal acceleration Time-of-Flight (oa-ToF) mass analyzer with a wide mass range up to 100,000 m/z and a resolving power of 20,000 FWHM. It provides both exact molecular weight (HRMS) and structural information (LRMS) for characterization of mainly organic compounds and some organometallic compounds and metal complexes with excellent sensitivity. The range of compounds for which the instrument can be used varies widely from small organic, inorganic, compounds to oligomers, polymers and biomolecules. The instrument will provide elemental confirmation that is essential for the support of patent applications or for the submission of data to scientific journals. The system incorporates IntelliStart™ technology, for automated system optimization and status monitoring, ensuring that the highest quality data is routinely available to all levels of operation.
21. **Isothermal Titration Calorimeter:** Model, iTTC200 Systems (GE Healthcare, USA), Non-reactive Hastelloy® cells for chemical resistance, Peltier controller for rapid temperature equilibration, operating within a temperature range of 2°C to 80°C.
22. **AFM Laboratory:** A new Atomic Force Microscope (Model 5500, Agilent Technologies, USA) has been installed in CRF in October 2013, and has been thrown open to users across the Institute. Apart from the regular scanning modes, that is contact and intermittent contact modes, the state of the art instrument is equipped with closed Z loop scanner for measurement of force between two surfaces, under liquid imaging capability, temperature control stage (30 °C to 250 °C) with in-situ imaging capability for time resolved experiments, integrated environmental control (with 6 ports for purging and venting), EFM (Electrical Force Microscope) and KFM (Kelvin probe microscope) in single pass in amplitude modulation (force) and frequency modulation (force gradient) modes, external variable magnetic field MFM with a magnetization range of +/- 850 Gauss. Since installation the instrument has been used to scan more than 600 samples till March 2014, spanning across 30 research groups in the Institute. Every day two three hour slots are given to the users, in which typically three samples are scanned. Experiments like EFM, MFM and under water imaging however takes longer time. Different samples that have been scanned successfully include polymer, metals, composites, biological molecules like proteins, quantum dots, nano patterns etc.
23. **Nuclear Magnetic Resonance (NMR) spectrometer Lab:** Recently, the institute has procured a Bruker Avance III HD 600 MHz (<sup>1</sup>H frequency) Nuclear Magnetic Resonance (NMR) spectrometer, which has been installed in Central Research Facility (CRF). The spectrometer is for recording high resolution one dimensional (1D) and two dimensional (2D) spectra of chemical and biological samples in solution. It has three probes, (a) broad band probe for recording spectra of all the NMR active nuclei, including <sup>19</sup>F, (b) one three channel (<sup>1</sup>H, <sup>13</sup>C and <sup>15</sup>N) inverse probe for 1D, 2D and triple resonance spectral measurements and (c) one liquid helium cooled cryoprobe for very high resolution spectral measurements. Also, it has variable temperature attachment for recording spectra at lower or higher temperatures.
24. **Dual Beam FIB-FEG Microscope Lab:** (Model: Auriga Compact Cross Beam system, Carl Zeiss, Germany) has been procured at CRF and is undergoing installation. It is equipped with both Electron and Ion Beam sources for applications including scanning electron microscopy, focused ion beam milling and lithography, along facility for TEM sample thinning and lift-out (Omniprobe 200, Oxford Instruments), as well as 3D energy dispersive spectroscopy and electron backscattered diffraction (Aztec, Oxford Instruments). The system can be used for observation using secondary and backscattered electron imaging modes, chemical analysis, orientation mapping, TEM sample preparation, as well as processing of nanostructures.

## New Acquisitions



1. DUAL/ CROSS BEAM FEG/FIB, CARL ZEISS MICROSCOPY GmbH, GERMANY.  
STATUS: Being installed.
2. AVANCE III HD 600 MHz ONEBAY HIGH PERFORMANCE DIGITAL NMR SPECTROMETER, BRUKER BioSpin INTERNATIONAL, SWITZERLAND.  
STATUS: Being installed.
3. SCANNING PROBE MICROSCOPE SYSTEM WITH DIFFERENT MODULES FOR MORPHOLOGICAL AND STRUCTURAL CHARACTERIZATION, AGILENT TECHNOLOGIES, SINGAPORE.  
STATUS: Installation Completed.
4. PHI 710 SCANNING AUGER NANOPROBE, PHYSICAL ELECTRONICS, USA  
STATUS: Being installed.
5. FLUORESCENCE ACTIVATED CELL SORTER, Model- FACS ARIA-III, BECTON DICKINSON HOLDING, SINGAPORE.  
STATUS: Installation Completed.
6. GENETIC ANALYZER (APPLIED BIO SYSTEM-3500), LIFE TECHNOLOGIES HOLDINGS Pte. Ltd, SINGAPORE.  
STATUS: Installation Completed.
7. MALDI – TOF. STATUS: Ordered.
8. FIELD EMISSION SCANNING ELECTRON MICROSCOPE with Energy Dispersive Spectrometer and Electron Backscattered Diffraction Facility. Model Merlin, Carl Zeiss, Germany.

## Central Workshop and Instruments Service Section

**Chairman** : **Prof. A. Roy Choudhury**

**WS** : **Dr. S. Patra**

The Central Workshop & Instruments Service Section (CWISS), a unique service centre at IIT, Kharagpur was established in 1965 to cater to the fabrication of custom made Instruments to sustain the Post Graduate & Research activity in the Institute for all the departments and centres.

It is one of the major service sections of the Institute having following units:

- (1) Mechanical
- (2) Glass Blowing
- (3) Carpentry
- (4) Electronics
- (5) Audio Visual

Apart from executing Work Orders from various Depts./Centres/Sections of the Institute, CWISS also undertakes Workorders from outside on cost basis.

### **1. Mechanical Section**

#### **a. Dr. S. Patra, Assistant Workshop Superintendent**

Mechanical Section in CWISS comprises Mechanical fabrication, Mechanical Instrument and Glass Blowing Section.

#### **b. Mechanical Fabrication Section**

It is equipped with various types of machines like CNC Lathe, table mounted CNC Lathe, CNC Engraving, CNC Milling, EDM, Milling, Conventional Lathe, Bench Lathe, Watch Maker's Lathe, Drilling, Shaping Machine, Bench Drill, Bench Shaper, Grinding Machines (Surface, Cylindrical, Pedestal, Belt and Hand operated), Jig Boring, Power Saw, Shearing Machine, Polishing, Press, Arc Welding, Brazing and Soldering, etc.. We have recently purchased one CNC WEDM and Laser welding machine these has enhanced our fabrication quantity and quality as well.

The Mechanical Fabrication Section caters the service to almost all the departments of the Institute for any type of Precision and complicated mechanical fabrication or repair with various types of metals with the machines available in section mostly for research and project works and regular experiment classes for B. Tech. and M. Tech. as per design.

In CNC Machines we use different types of software for drawings like Auto CAD, Rhinoceros, 3D Studio Max, Solidworks etc. for drawing works of the components to be fabricated and also use different types of CAM software for their fabrication.

During the year 2013-14 the Mechanical Section has performed jobs of about 153 workorders.

**Some of the notable fabrications successfully completed by CWISS are as follows:**

- 1) Fabrication of different types of fixtures.

- 2) Chassis of Robot and gears of Robocup.
- 3) Fabrication of Die and Extruder.
- 4) Fabrication of Die-Punches of different sizes.
- 5) Fabrication of different sizes tensile, Charpy specimens, creep specimens of different materials.
- 6) Fabrication of Rack, Pinion & Gears.
- 7) Fabrication of Moulds with different type of metals.
- 8) Fabrication of dilatometer samples.
- 9) Fabrication of different types of grippers.
- 10) Fabrication of Micro- channel of various sizes.
- 11) Fabrication of different types of adopters.
- 12) Fabrication of various types of electrodes.
- 13) Fabrication of fixtures for experiments.
- 14) Fabrication of shaft encoder.
- 15) Fabrication of SEM samples.

## 2. Glass Blowing Section

This section is equipped with glass blowing lathe, glasscutter, glass grinder, glass annealing chamber, etc.. Mainly glass work of Borosilicate glass is done here with the help of oxygen & LPG for Departments, like Chemistry, Bio-Technology, Chemical, Cryogenic, Mechanical, Material Science, Metallurgical & Materials Engg., Agriculture & Food Engg., Physics & Meteorology etc. The main fabrication jobs of this section include different type of condensers, Dewars, different volume capacity F.B, R.B., Flusk with neck joints, manometer, U & S Tubes, glass bubbler, glass coil for oil bath, gas collector, etc. The fabrication of Glass ware items are done as per drawing and design of the equipments. Shortly we are going to arrange for training the interested Institute staff on Glass Blowing and fabricate different glassware items.

## 3. Carpentry Section

Housed in the workshop complex behind Chemical Engg. & Automobile Section, This section has Auto Planner, Joints Nature's machinery, Vertical Band Saw and Multipurpose Machine. Apart from carpentry jobs, as per requirement of the Institute it does also undertake construction of MS Frames, Hand painting, Spray painting, Polishing, Writing of name plates, display board & jobs as required by students projects.

This section also meets the major requirements of furniture of the Institute. During the year 2013-14, this section has completed 119 Workorders of various departments of the Institute.

### Details of some of the work done during 2013-14:

1) Faculty Table set	--	33 Nos.
2) Office Table	--	07 Nos.
3) Computer Table	--	12 Nos.
4) Laboratory Table	--	21 Nos.
5) Conference type meeting table	--	01 No.
6) Book Shelf	--	03 Nos.

7) Students' model of different shape	--	25 Nos.
8) Framing of metallic name plate	--	01 No.
9) Tender Box	--	01 No.
10) Repair of Furniture	--	07 Nos.
11) Name Plate/ Sign Board	--	82 Nos.
12) Modification of damaged furniture	--	01 No.
13) No parking board	--	05 Nos.
14) Trolley type tray	--	01 No.
15) Partition	--	04 Nos.
16) Key	--	01 Nos.
17) Daily chart board	--	01 No.
18) First Aid Box	--	01 No.
19) High / Low bench	--	50 Nos.
20) Stools	--	67 Nos.
21) Notice Board	--	04 Nos.

#### **4. Electronics Section**

Electronics section of CWISS has facilities for repair of different types of electronic equipments. It also helps users in their design and development activities. A LPKF PCB Prototyping machine is available in this section which helps the users of different departments in fabrication of double sided PCBs.

#### **5. Audio Visual Section**

Audio Visual Cell is primarily involved in providing audio visual support for conducting regular classes at different lecture halls (approximately 400 classes per week). It supports audiovisual facilities with Multimedia projectors, Document cameras, PCs and PA system with wireless microphones for the following class rooms: V1, V2, V3 & V4 at Vikramshila complex and F116, F127, F142, F232 & F244 at main building area. During last semester the Cell could extend support to 10 new classrooms at Nalanda classroom complex. A total 44 nos. of classrooms at Nalanda classroom complex, equipped with full AV equipments, will be available in the next Autumn semester 2014.

AV Cell used to provide support about 11,600 regular classes throughout the year in aforesaid classrooms. Besides these the Cell provides AV facilities for all seminars, symposiums, workshops,

short term courses and meetings at Gargi, Moitrei, S. N. Bose Auditorium and associated programme at Netaji , Kalidas Auditorium, Senate hall, Committee room and Board room. All the T. S. G. activity programmes are also supported by the Cell. AV Cell also provides support to various student activities like Quiz, Plays, Spring festival, Kshitij, Inter Hall competitions and T&P activities.

It also helps in various other academic activities like Convocation, Senate Meeting, National & International seminars, Conferences and Workshops and also including JEE & GATE units. AVCell also given technical support for pre-placement talk during office hours & beyond office hours and sometime till midnight for special cases.

The Audio Visual Cell has a good number of sophisticated equipments like Multimedia Projectors, Document Cameras, High quality Amplifiers and Mixtures, Wireless Microphones & Conference Systems and other peripheral supporting systems. Primary maintenance of these equipments are also maintained by AVCell staff itself.

## Centre for Theoretical Studies

**HEAD:** P.K.Chattaraj (Till 07.10.13), Sayan Kar (From 08.10.13)

### FACULTY MEMBERS

	<b>Name</b>	<b>Degree</b>	<b>Specialization</b>
1	P. K. Chattaraj	M. Sc., Ph.D (IIT Bombay)	Chemistry (Theoretical Chemistry, Quantum Chaos )
2	A.R.Roy	Ph.D (IIT Kharagpur)	Mathematics (General Theory of Relativity, Theoretical Cosmology, Algebra and Application of Soft Set theory, Dynamics of Nonlinear Systems)
3	A. Taraphder	M. Sc., Ph.D (IISc Bangalore)	Physics (Theoretical Condensed Matter Physics)
4	S.Bharadwaj	M. Sc., Ph.D (IISc Bangalore)	Physics (Theoretical Astrophysics and Cosmology)
5	Sayan Kar	M. Sc., Ph.D (IIT Kanpur)	Physics (Relativity and High Energy Physics )
6	S. Pratik Khastgir	M. Sc., Ph.D (IOP, Bhubaneswar)	Physics (Mathematical Physics and Integral Models)
7	Anirvan DasGupta	B.Tech, M.Tech., Ph.D (Kanpur)	Mechanical (Dynamics, Control and Robotics. )
8	S.P.Pal	B. Tech (Hons.), M. Tech, Ph.D (IISc Bangalore)	Computer Sc. and Eng. (Computational geometry, Design and analysis of algorithms.)
9	S. Bandyopadhyay	M. Sc., Ph.D (IISc Bangalore)	Chemistry (Computational Chemistry, Molecular Modelling )
10	Somesh Kumar	MSc.,Ph.D (IIT Kanpur)	Mathematics (Statistical Decision Theory and Inference, Quantum Computing)
11	Suman Chakraborty	Ph.D	Mechanical (Microfluidics and Nanofluidics, Interfacial Phenomena, Transport Phenomena in Materials Processing, Computational Fluid Dynamics (CFD))
12	G.P.Raja Sekhar	Ph.D.(Hyderabad Univ)	Mathematics (Boundary integral methods for viscous flows, Mass transfer in porous biological pellets)
13	Pratima Panigrahi	Ph.D.(Bangalore)	Mathematics (Combinatorics, Graph Theory)
14		Head, Mathematics	
15.		Head, Physics	

### Associate of CTS:

1.	P. A. Deshpande	Ph.D.(IISc., Bangalore)	Chemical (Electronic structure calculations, Computational catalysis, First principles analysis of physiological reactions)
2.	Venkat	Ph.D.(Columbia University)	Chemical (Advanced Functional Materials, Polymer Nanocomposites, Bio-Mechanics)

	Padmanabhan		of C. elegans, Organic Photovoltaics)
3.	Chirag Kalelkar	Ph.D. (IISc., Bangalore)	Mechanical, Rheology, Fluid Dynamics
4.	Sanjoy Majumder	Ph.D.(IIA Bangalore)	Physics (Computational Many-body physics, Atomic & Molecular Physics, Theoretical modeling of bulk and nano-materials, Astronomy and Astrophysics, Physics of Ultra-Cold atom)
5.	Kamal Panigrahi	Ph.D.(Institute of Physics, Bhubaneswar)	Physics (String Theory, High Energy Physics, String Inspired Cosmology)
6.	Sabyashachi Mishra	Ph.D. (Tech. Univ. Munich, Germany)	Chemistry (Theory of Relativistic Vibronic Coupling in Molecular Physics, Relativistic Quantum Chemistry, Molecular Structure and Spectroscopy in Excited States, Reactive Processes in Biology, Network Dynamics in Bio-(chemical/physical processes)

**Staff: Name**

**Degree**

**Specialization**

Ujal Halder	Post Diploma in Computer App., Diploma in Electrical Engg.	Computer (Administration, Networking, Web development, Troubleshooting etc.)
Project Staff: Name	Project, Post	Period
Soumya Bhattacharya	JRF	3 years

**Brief Descriptions on-going activities**

Research is carried out in CTS on the following areas:

I. Astrophysics, Cosmology and Relativity

- (i) Magnetic fields of strange stars and neutron stars
- (ii) Large scale structure formation in the Universe
- (iii) Bulk-brane dynamics

II. Dynamics and control

- (i) Nonlinear dynamics: Bifurcation Theory and Chaos
- (ii) Control theory

(iii) Vibrations

### III. Mathematics, Mathematical physics and Theoretical Computer Science

- (i) Integrable models
- (ii) Computational and combinatorial geometry
- (iii) Pure and applied mathematics
- (iv) Quantum computation and quantum information
- (v) Graph and Hypergraph Theory

### IV. Theoretical Condensed Matter Physics

- (i) Computational Condensed Matter and Statistical Physics
- (ii) Superconductivity

### V. Theoretical Chemistry

- (i) Large scale simulations of complex systems
- (ii) Density functional theory, quantum chaos

### **Thrust Areas**

1. Astrophysics, Cosmology & Relativity
2. Nonlinear Sciences
3. Mathematics, Mathematical physics and Theoretical Computer Science
4. Theoretical Condensed matter Physics
5. Theoretical Chemistry

### **Courses and Graduate Programme:**

- CTS is offering new advanced post-graduate courses which are relevant across departments through involvement of faculty from various departments. These courses are:
  1. Methods in molecular simulations (TS70001)
  2. Advanced dynamics (TS70002)
  3. Wave propagation in continuous media (TS70003)
  4. Advanced Mathematical techniques (TS70004)
  5. Advanced quantum theory (TS70005)
  6. Quantum mechanics and quantum computing (TS70006)
- CTS are also admitting PhD students through institute fellowships, CSIR fellowships. Currently two such students are enrolled.

### **CTS courses taught (2013-14):**



1. Quantum mechanics and quantum computing (TS70006) (Autumn)
2. Advanced Mathematical techniques (TS70004) (Autumn)
3. Methods in molecular simulations (TS70001) (Spring)
4. Wave Propagation in continuous media (TS70003) (Spring)

### **COLLABORATIVE EFFORTS**

The Centre for Theoretical Studies has very active collaborative research programmes in the board areas of Astrophysics and Cosmology. The research carried out under this collaboration is focused mainly on Cosmology. The collaboration with NCRA, TIFR, Pune is through a sponsored project funded by BRNS, DAE, Mumbai. This focuses on the possibility of using low-frequency radio wave observations to study a variety of astrophysical processes through the 21 cm neutral hydrogen radiation, including turbulence in the interstellar medium and the early universe.

**Visitors during 2013 – 2014 under CTS Visitors Programme: 10**

**Lectures by Visiting Experts: 12**

## Computer and Informatics Centre

**HEAD :** Prof. Prabir Kumar Biswas

**CONCERNED FACULTY/OFFICERS (with degrees and specialization)**

Name	Degree	Specialization
Dilip Kumar Nanda	M.Sc, DIIT, PhD (IIT Kharagpur)	IT Infrastructure Management and Operations, Application Software & Numerical Techniques
Partha Goswami	BTech (C.U), M.Tech (IIT Kharagpur)	Enterprise & Optical transport network
Alok Baran Das	B.Tech (CU)	working, Hardware Specialist & Trouble shooter
Bimal Kanti Dutta*	M.Sc, P.G.D.C.S (Roorkee Univ.)	DBMS, OS, Algorithms, Computer Networks, Distributed DBMS & Graphics Programming.
Surid Kumar Das	B.Tech, MTech (Rajasthan Vidyapith Deemed University)	Hardware, Computer Network
A. Chattopadhyay	M.Sc, M.S (IIT Kharagpur)	Hardware, OS, Network Security & Applications
Sudipto Das	B. Tech, MTech (Rajasthan Vidyapith Deemed University)	OS, Network Applications and Security
Deepan Banerjee	B.Tech (WBUT)	Networking, Routing Switching & Wireless
Tanumoy Ghosal	B.Tech (WBUT)	Networking & Security Aspects
Subhasish Chattopadhyay	B Tech (WBUT)	Networking & Specialist in FTTH

**\*Retired on 31.01.2014**

### FACILITIES

#### Networking Facilities in the Institute

The QPN facility provided in the Institute campus is running with satisfaction and with time more number of locations is being brought under its fold by CIC. This facility is currently being used as the lifeline for all Department/Centre/Schools/Sections who are using the networking rigorously for their daily work schedule. The Institute Internet bandwidth has been increased by 1 Gbps. This has been done by relocating the bandwidth available to the Institute for NKN video conferencing. In addition to the network usage being carried out for the research and academic activities of the Institute there are

many other utility services of the Institute that are regularly utilizing the network. Some the utilities are:

- Computerized remote capturing of data for billing from Electric Meters in the Campus
- Centralized monitoring & recording of Video input from security surveillance cameras placed at strategic locations
- Hosting of websites of all support services for online complain & query system
- Centralized network support to Training & Placement activities for online tests, interviews & video conferencing

Networking facilities have been extended to the following location by during the year under review. Some of the location where major networking has been undertaken is given below:

- Dr B R Ambedkar hall of Residence
- Lal Bahadur Sashtri hall of Residence
- Addition Network points of Azad & Nehru Hall of Residence
- Mother Teresa hall of residence for girl students
- Bachelors Flat 1 & 3 Converted to Girls Hostel accommodation
- CEP Guest house & Residence
- V Niwas Annex building
- 2 BR & 1 BR Faculty & Staff quarters
- New building of Computer Science & Engineering Department
- Second Floor of Bio Technology Department
- Sir J C Bose Laboratory Complex
- 2<sup>nd</sup> floor of Industrial & System Engineering
- Nalanda Class Room Complex
- PC Lab V of CIC
- Networking to the Kendriya Vidyalaya, DAV Model School, Hijli High School and St Agnes School

### **Laboratory Facility**

- The CIC laboratories has been used in full swing for conducting Institute Computing laboratory classes, registration of students in both semesters, Training & Placement activities, short term courses and International seminars, tech festival like Kshitij, Spring festival and other computer contests organized by Department/Centers/Schools of the Institute.
- The CIC PC laboratories have also supported online examinations like GATE exams.

### ***Other Facilities (Software & Hardware)***

- Institute has renewed the existing antivirus software “Trend Micro Enterprise Security Suite with Advanced Reporting Module” for 20000 User licenses. This software would be protecting the Endpoint Security, Gateway security, Web Gateway, Messaging Gateway, Mail Servers, File Servers and also be capable of providing advanced reporting on possible threats.
- Software for Mail Messaging Solution for 20000 users is also in use faculty, staff and students of the Institute.
- VPN support is being provided to users for connecting to Institute network from any outside network

- Other software available to the user community include, Microsoft campus wide licensing, Software's like Abacus (for finite element modeling and analysis), MATLAB (for integrated technical computing), Solid Works (for engineering drawing), PASW (statistical package) and ANSYS etc.
- Additional Blades have been procured to augment the existing facilities and support the ERP activities, JEE & GATE examinations.

## Continuing Education Center

1. **Name of the Centre/Unit** : Continuing Education Centre.

2. **Full name of the Dean** : Prof. Om Prakash Sha

3. **Short Term Courses Organized by the Unit**

Sl. No.	Short term courses organized under	No. of Courses	No. of participants	Duration
1.	QIP (AICTE) Short Term Courses	07	210	11 Weeks
2.	Sponsored/Self finance Short term courses	60	1600 (approx.)	1 week for each course  (approx.)
3.	Workshop/ National & International Conference	18	800 (approx.)	3-4 days for each conf.
	Total =	85	2610	

**3-Year M. Tech Programme organised by the Unit**

Sl. No.	Name of the Subject	No. of Students	Duration
1.	Electrical Engineering	54	3 Years
2.	Electronics and Electrical Communication Engineering	82	3 Years
3.	Information & communication Technology	54	3 years

**3-Year Executive MBA Programme organised by the Unit**

Sl. No.	Name of the Campus	No. of Students	Duration
1.	Kolkata campus	25	3 Years
2.	Bhubaneswar campus	04	3 Years

**Empowerment of Students and Teachers through Synchronous & Asynchronous**

**Instruction (EIT) under NMEICT, MHRD**

Sl. No.	Title of Workshop	No. of trainers/ participants	Duration
1.	Analog Electronics	221 / 7427	1 week / 2 weeks
2.	Signal & Systems	237 / 8730	1 week / 2 weeks
3.	Fluid Mechanics	229 / 8000	1 week / 2 weeks

**International Summer and Winter Term (ISWT 2014)**

Indian Institute of Technology Kharagpur from May 2014 is starting its first international summer and winter term (ISWT) where the national and international participants will get an opportunity to seek knowledge and experience from reputed International faculty through intensive study of subjects and personal interactions. 19 subjects will be offered during the summer term (May-June-July) and 10 subjects during the winter term (December). These subjects are designed around current and multidisciplinary themes of Science, Engineering, Management and Law. The duration for each subject is of 2 weeks or 10 working days with a judicious blend of lectures and tutorials per day.

**4. Facilities:**

Video-Conferencing Studios at Kolkata (3), Bhubaneswar (3) and Kharagpur (4) & Raipur (2)  
Seating Capacity (60 + 40 + 40 + 40 +40)

**Seminars/Workshops/Conferences Organized by the Unit**

Total No. of Workshops/Conferences Organized : 18  
Total No. of participants attended : 800 +

**Particulars of M.Tech and Ph.D scholars joined/completed under QIP**

A. No. of Teachers completed Ph.D degree under QIP : 07  
B. No. of Teachers completed M.Tech programme under QIP : 08  
C. No. of Teachers joined Ph.D programme under QIP : 10  
D. No. of Teachers taking advance admission to Ph.D programme under QIP : 12  
E. No. of Teachers joined M.Tech. programme : 07

**Particulars of 3-year M.Tech Programme:**

A. No. of students completing the course under EC specialisation : 23  
B. No. of students completing the course under EE specialisation : 15  
C. No. of students completing the course under IT specialisation : 13

**Particulars of 3-year Executive MBA programme**

A. No. of students completing the course from Kolkata campus	: 25
B. No. of students completing the course from Bhubaneswar campus	: 04
<b>CD Cell activities</b>	
Manuscripts for text books completed	: 01

## Estate Electrical and Maintenance Work Section

The Estate Electrical and Mechanical Works Section is constantly engaged in upgradation and modernisation of the power system starting from the receiving substation at 33kV to the Distribution Substations, power distribution system in the departments and sections and renovation of the internal wirings of the existing departments and sections with the latest state of the art using energy efficient luminaries and aesthetically appealing accessories.

The major achievements of the section are enumerated as follows:-

- Augmentation and Modernisation of main receiving 33kV/11kV Substation from 9.0 MVA to 20.1 MVA
- Augmentation and upgradation of the 11kV/415V distribution substations to double their capacities with new transformers, Vacuum Circuit breakers for 11kV and Air Circuit breakers for low voltage distribution.
- Augmentation of existing substation at Balarampur Pump house
- Implementation of Ring main system in the institute has been successfully completed in the 11kV and 415V network so as to ensure reliability of power supply despite fault in a particular line.
- Modernization of the distribution system in the departments, Centres and section by replacement of the low voltage distribution panels using Air Circuit breaker and Moulded Case Circuit breakers, rewiring by concealed method and using energy efficient luminaries for illumination.
- Trunk Bus alley in the first floor of the main building has been successfully implemented to ensure safety and frequent failure outbreak of fire from electric short circuit.
- Illumination augmentation of the Swimming pool, Gyan Ghosh stadium, Tennis court, Basketball and Volleyball court in accordance with intentional illumination standards using relevant illumination software.
- Installation of energy efficient LED street lights in different new roads of the campus.
- Illumination of the landscaped area in front of the Students Activity Centre.
- The section has successfully installed green, silent and environment friendly DG sets at Kolkata extension centre, Biotechnology department and CORAL.
- **Students Activity Centre:** Electrification of the new Students Activity Centre along with provisions for emergency power. The latest international standards of illumination for indoor sports lighting has been followed strictly.



- **Laboratory Complex:** The first phase of the electrification of the new laboratory complex to cater to the requirements of the first year students has been successfully completed and handed over to the respective departments.
- Electrification of the MBE-MOCVD Laboratory in the CWISS building.
- Installation of Capacitor banks at 11kV and 415V for improvement of Power factor. Steps have also been taken towards improvement of power quality by installation of FACTS devices.
- The electrification of Rajendra Mishra School of Engineering Entrepreneurship and Innovation Laboratory in the STEP complex has been successfully completed and handed over to the respective department.
- Centre for Railway Research: The electrification of the research has been successfully completed. The electrical works consisted of the following
  - A new 3x500 kVA substation dedicated to the Centre to cater to the loads of the various experimental facilities.
  - Internal electrification and workshop illumination of the centre using the latest standards.
  - Establishment of a single phase 25kV source for experimental facility.

### **WORKS UNDER PROGRESS**

- Augmentation of existing substation at Anikut Pump house.
- Installation of Solar Power for illumination of the lake and the adjoining area.
- Electrification of the Steel Technology Centre.
- Electrification of the Mechanical workshop.
- Electrification of the Annex to the new Computer Science building.
- Electrification and upgradation of the sheds behind the hanger for CRR, PK Sinha Centre for Bio Energy, Transportation lab of the Civil Engineering department and OE & NA laboratory.
- Expansion and Electrification of the Nehru Museum.

### **NEW WORK TAKEN UP**

- Implementation of 100 kw Micro Grid system using Solar Power.
- Installation of Cable Management System and Bus Trunking facility for the administrative building.
- Augmentation of Substation no- 5.
- Implementation of SCADA and data acquisition from energy meters of the quarters in the campus using Wi fi network of the Institute.
- Replacement of 25 nos old electrical panels in halls and also distribution board's with new state of art modular panels and MCB distribution boards for better distribution of electricity by replacing old and burn out electrical panels and Distribution Boards.

## ESTATE CIVIL HEAD OFFICE

As a part of the ongoing infrastructural development, various construction projects have been taken up by Estate Civil Head Office. Current status of those projects is as follows:

### STUDENTS ACCOMMODATION :

650 rooms of B.R. Ambedkar Hall of Residence have already been handed over. Renovation of 118 capacity Girls' Hostel in the existing Old Kendirya Vidyalaya is completed and 76 rooms have already been handed over to HMC.

### NALANDA CLASSROOM COMPLEX :

58 class rooms have been handed over & Furniture etc. for 30 class rooms have been completed for use. Classes are being held from this semester in 30 class rooms.

### J.C. GHOSH SCIENCE BLOCK & P.C ROY LABORATORY BLOCK :

Roof slabs for both the Blocks are complete.

### A.J.C. BOSE LABORATORY COMPLEX :

Construction of extension portion is already over and all laboratories had been handed over and they are under use.

### NEW WATER SUPPLY PROJECT :

8.40 km. of pipelines have been laid. Construction at river bed is going on.

### DEVELOPMENT OF CHILDREN PARKS AT CAMPUS :

Six children parks at Campus have been developed. Recently one Children Park near Gas Godown has been inaugurated by the Director on 5<sup>th</sup> June, 2014.

### EXPANSION WORK IN ACADEMIC BUILDINGS :

Entire Expansion work of Department of IE&M, Chemical Engineering and New buildings for Department of Mechanical Engineering and Computer Science & Engineering have been completed. Expansion work of Department of Biotechnology is completed. Expansion works of Department of A&RP, Materials Science Centre, SMST, NCC etc. are under process.

### CONSTRUCTION OF A-TYPE FACULTY APARMENTS :

For 2 Blocks total RCC completed. For 1 Block (28 Flats) will be handed over shortly and balance 28 Flats will be handed over on December, 2014.

### CONSTRUCTION OF B-TYPE FACULTY APARTMENTS :

Conceptual drawings approved. BOQ scrutiny is in progress.

### CONSTRUCTION OF MARRIED SCHOLARS ACCOMMODATION :

Conceptual drawings approved. After scrutiny of BOQ submitted for additional amount approval, which has been approved in the 115<sup>th</sup> BWC. Construction started.

CONSTRUCITON OF FAUCLTY TRANSIT APARTMENTS :

Conceptual drawings approved. After scrutiny of BOQ submitted for additional amount approval, which has been approved in the 115<sup>th</sup> BWC. Construction started.

EXPANSION OF VIKRAM SARABHAI RESIDENTIAL ACCOMMODATION :

Conceptual drawings approved. BOQ scrutiny is in progress.

CONSTRUCTION OF SUPER SPECIALITY HOSPITAL :

The Master Plan for the Super Speciality Hospital has been accepted by the Institute. The floor layouts of the Hospital building to be considered in the first phase have also been approved by the Institute. The Architect and PMC would make another presentation on 19.06.2014 involving the overall layout of the Hospital building and other services buildings for approval of IIT Kharagpur. All plans etc. are approved. Tendering process will start very soon.

CONSTRUCTION OF RESEARCH PARK AT RAJARHAT KOLKATA:

CPWD have submitted the floor plans and the same have been approved by the Institute after several interactions. The preliminary estimate has been recently received from CPWD, Kolkata. CPWD have been advised to initiate the process of submission of drawings to NKDA.

CONSTRUCTION OF NIVEDITA HALL OF RESIDENCE :

Foundation work is going on for the new construction.

## Extra Academic Activities

### National Service Scheme

#### Introduction

Recent activities of the National Service Scheme (NSS) team of IIT Kharagpur are summarized herein. The scheme is administered according to the guidelines of the Ministry of Youth Affairs and Sports, Government of India and endeavors to add an extra dimension to the higher education by motivating youth for community service. The activities undertaken in this program has been included in the core curriculum of the undergraduate program of IIT Kharagpur. The curriculum requires three hours to be performed by each student over the entire academic session. Participating students are only entitled to their usual privileges at IIT Kharagpur if they demonstrate a satisfactory performance in the program.

At present NSS team of IIT Kharagpur includes about 1000 students every year (a five-year total of about 4000 students), mainly from the 1<sup>st</sup> and 2<sup>nd</sup> year of the undergraduate program, 16 Program Officers, a Program Coordinator and a part time accountant. The current yearly expenditure of the program stands at about Rupees four lakh ten thousand, of which Rupees three lakh seventy thousand was the grant-in-aid sanctioned by the state government. Currently, the team is organized into 15 units, each comprising of between 60 and 70 students. Names and contact particulars of the present team of Program Officers (PO) and Program Coordinator (PC) can be found in Table 1. Twenty villages and slums spread over an area extending to about 8 km from IIT Campus have been adopted by NSS units of IIT Kharagpur. Weekly and special (yearly) activities of NSS at these villages are described in the following section.

**Table 1.** Officers, NSS – IIT Kharagpur

Name (Function, Unit)	Telephone	Email
V Racherla (PO, 1)	3222 282900	<a href="mailto:vikranth.racherla@mech.iitkgp.ernet.in">vikranth.racherla@mech.iitkgp.ernet.in</a>
RK Rawat (PO, 2)	3222 282864	<a href="mailto:rkrawat@hijli.iitkgp.ernet.in">rkrawat@hijli.iitkgp.ernet.in</a>
D Dhara (PO, 3)	3222 282326	<a href="mailto:dibakar@chem.iitkgp.ernet.in">dibakar@chem.iitkgp.ernet.in</a>
A Nag (PO, 4)	3222 281900	<a href="mailto:ahinnag@chem.iitkgp.ernet.in">ahinnag@chem.iitkgp.ernet.in</a>
DK Swain (PO, 5)	3222 283170	<a href="mailto:swain@agfe.iitkgp.ernet.in">swain@agfe.iitkgp.ernet.in</a>
MK Das (PO, 6)	3222-282924	<a href="mailto:manab@mech.iitkgp.ernet.in">manab@mech.iitkgp.ernet.in</a>
MP Rajak (PO, 7)	3222 281800	<a href="mailto:mpr@hijli.iitkgp.ernet.in">mpr@hijli.iitkgp.ernet.in</a>
M Halder (PO, 8)	3222 283314	<a href="mailto:mintu@chem.iitkgp.ernet.in">mintu@chem.iitkgp.ernet.in</a>
P Guha (PO, 9)	3222 283124	<a href="mailto:pguha@agfe.iitkgp.ernet.in">pguha@agfe.iitkgp.ernet.in</a>
NDP Singh (PO, 10)	3222 282324	<a href="mailto:ndpradeep@chem.iitkgp.ernet.in">ndpradeep@chem.iitkgp.ernet.in</a>
P Bhattacharya (PO, 11)	3222 282472	<a href="mailto:paramita@civil.iitkgp.ernet.in">paramita@civil.iitkgp.ernet.in</a>
RK Sen / BM Manoj (PO, 12)	3222 283752	<a href="mailto:rksen@hijli.iitkgp.ernet.in">rksen@hijli.iitkgp.ernet.in</a>
A Deb (PO, 13)	3222 283412	<a href="mailto:arghya@civil.iitkgp.ernet.in">arghya@civil.iitkgp.ernet.in</a>
S Misra (PO, 14)	3222 282338	<a href="mailto:smisra.editor@gmail.com">smisra.editor@gmail.com</a>
V Adyam (PO, 15)	3222 282340	<a href="mailto:venimadhav@hijli.iitkgp.ernet.in">venimadhav@hijli.iitkgp.ernet.in</a>
A George (PO, Admin)	3222 283236	<a href="mailto:abraham@arp.iitkgp.ernet.in">abraham@arp.iitkgp.ernet.in</a>
D Roy (PC, NSS)	3222 283456	<a href="mailto:debasis@civil.iitkgp.ernet.in">debasis@civil.iitkgp.ernet.in</a>

## **Activities**

NSS – IIT Kharagpur work on a range of social issues including teaching, organization of medical camp and blood donation camp, and conducting environmental and social awareness campaigns. Its regular and special activities are summarized in the following subsections.

### **Regular Activities**

Each unit identifies activities in adopted villages or slums based on their survey and open house meetings to consult local residents, government representatives (e.g., Panchayat Memembers, and Municipal Councillors), community workers and leaders (e.g., School Teachers, Rural Medical Practitioners, and Anganwadis) and government officials (e.g., SDO, BDO, and forestry officials). Main activities undertaken by the units during their weekly involvement are listed in Table 2.

### **Special Activities**

Special activities included NSS Annual Camp, celebrations of the Independence Day and the Annual Day of NSS – IIT Kharagpur. The special activities are listed in Table 3.

### **NSS – IIT Kharagpur in the news**

The activities undertaken by NSS – IIT Kharagpur were covered by local media. Additional and latest information on the activities of NSS – IIT Kharagpur can also be found at [nssiitkgp.blogspot.com](http://nssiitkgp.blogspot.com).

**Table 2. Regular activities**

Unit	Location (Number of volunteers / beneficiaries)	Activities (duration)
1	Sonamukhi and Jhuli: 75 / 100	Teaching at 3 primary schools (Jan-Apr), computer training for local youth (Jan-Apr), clothes collection from IIT Campus for distribution amongst slum dwellers and at Annual Camp (Apr), Prerana scholarship distribution (Jan-Apr)
2	Salboni and Ayodhagarh: 54 / 200	Teaching at Shishu Shiksha Kendra of state government at Ayodhyagarh (Jan-Apr), and collection of clothes, books and household items from IIT Campus and their distribution at Salboni and Ayodhyagarh (Jan-Apr), distribution of books and stationery items to school students (Feb-Mar), open house with local residents and local government representatives (Mar)
3	Salua Board and Rakhalgeria Primary Schools: 64 / 175	Teaching (curricular and extra-curricular) village students of grades up to VI (Jan-Apr)
4	Porapara and Chamrusai: 70 / 200	Teaching and taking computer classes Premananda Ashram School, Chamrusai (Jan-Apr), maintenance of a club building used for tutoring local children (door / window painting, whitewashing of building walls and repair of a shed) at Porapara (Feb-Apr), survey of social and economic conditions of Porapara residents (Mar-Apr), institution of a scholarship in memory of Abhik Mahto, a class VI student from Porapara under Unit 4 tutorship, who passed away recently (Apr), open house with local residents and local government representatives (Apr)
5	Pariapara: 75 / 250	Teaching at a primary school (Jan-Apr), Setting up a library at the primary school (Feb), organizing a cricket match between NSS volunteers and Pariapara residents (Jan) and a sports meet (Mar), filing online for SC/ST certificates for ~30 Pariapara residents (Mar-Apr)
6	Gholghoria: 74 / 350	Teaching at Gholghoria primary school (Jan-Apr), maintenance of school building (door / window painting, whitewashing of building walls) at Gholghoria primary school (Feb-Apr), tending of saplings (Jan-Apr), water quality testing (Jan-Apr), medical camp in which about 180 villagers from Gholghoria, Ayodhyagarh, Salboni and Gopali were treated by seven doctors and one optometrist and were provided with prescribed medicine free of cost (Jan), organization of a sports meet (Mar)
7	Gangadharpur and Debigeria: 64 / 350	Teaching at a state government Shishu Shikksha Niketan (Jan-Apr), maintenance of school building and premises (door / window painting and erection of a bamboo fence) at primary school (Mar-Apr), organization of a football tournament and a sports meet (Jan), distribution of exercise books and stationery at Kenthia Primary School (Jan), Prerana scholarship distribution (Jan-Apr)
8	Balarampur (71 / 300)	Teaching students of grades IX to XII (Jan-Apr), organizing test for awarding Prerana scholarships (Apr), data collection for SC/ST certificate filing for about 50 villagers (Jan-Apr), administering "Vivekdisha," a distance learning program for high school students webcast from RKMVU, Belur, Howrah (Jan-Apr), clothes collection from IIT Campus and distribution at Balarampur (Jan-Feb), Help two destitute village residents with hutments repair (Apr)
9	6 IIT residence halls (12 / 35); Mata Mandir, Durga Mandir and Shiv	Teaching underprivileged children employed within IIT Campus and slum households around IIT Kharagpur

	Mandir, Telugu Basti Tuli Para (18 / 95); Hindi Bharti Prim. School, Jhuli (4 / 200); Netaji Club, North Ghagra (4 / 15); Puri Gate Basti (5 / 12); Sanjay Prasad's residence, Puri Gate (5 / 20); Dhobi Ghat (4 / 50)	
10	Ayma (44 / 600) and Kasturba Primary School (26 / 100)	Teaching at Chhattisgarh High School, Ayma and Kasturba Primary School, Balarampur (Jan-Apr), personality development training for students at Chhattisgarh High School (Jan-Apr), school facilities upkeep (Jan-Apr), collecting and donating books for school library at Chhattisgarh High School (Jan-Apr), help organizing sports meet at Chhattisgarh High School (Jan)
11	Talbagicha (69 / 120)	Teaching 50 to 60 students of standards VIII to X at Talbagicha High School twice a week (30 volunteers Jan-Apr), clothes and medicine from IIT campus collection and cataloging collected items (39 NSS volunteers Jan-Apr), administering "Vivekdisha" (Jan-Apr), Kanyashree Prakashya baseline survey (Feb-Apr), maintenance of school building (whitewashing of two class rooms) (Apr), organization of thalassemia awareness camp (Feb) and a camp blood testing for thalassemia detection (80 beneficiaries) (Mar)
12	Rangameti (70 / 120)	Teaching primary school students (Jan-Apr), Kanyashree Prakashya baseline survey (Feb-Apr), open house with local residents and local government representatives leading to the identification of adult education and water quality assessment as two potential future activities (Mar)
13	Kashijora (60 / 150)	Teaching at Kashijora Primary School (Jan-Apr), cleaning and upkeep of school premises (Jan-Apr), distribution of first aid kit 60 village residents (Jan), collecting books from IIT campus residents and setting up a library at Kashijora Primary School with donated books (Jan-Mar)
14	Ghagra (64 / 200)	Teaching primary school children (Jan-Apr), temple rehabilitation (Jan-Apr), organizing test for awarding Prerana scholarships (Apr), organizing a medical camp that served about 50 Ghagra residents and distribution of medicine free of cost to the patients (Mar)
15	Sholadahar (65 / 200)	Teaching at a primary school (Jan-Apr), tutoring Sholadahar high school students (Jan-Apr), vocational training (Jan-Apr), medical camp (50 beneficiaries) (Mar), organizing cultural events and street plays to spread awareness on the benefits of SC/ST certificates and Kanyashree Prakashya (Feb, Apr)

**Table 3. Special activities**

<b>Event / date(s) / Location</b>	<b>Activities (duration)</b>
National Youth Day / January 12, 2014 / IIT Kharagpur	A rally was organized by NSS – IIT Kharagpur to mark the occasion continuing with the NSS tradition. Campus residents participated in the rally alongside NSS volunteers. They followed a 5-km course with colorful posters.
Republic Day / January 26, 2014 / IIT Kharagpur	NSS volunteers participated in the celebration of Republic Day in the IIT Kharagpur Campus as in other years. Continuing with IIT Kharagpur tradition, NSS volunteers facilitated the celebration by organizing local school children and providing refreshments to them on January 26 as well as during the children’s rehearsal on two occasions before the actual celebration. As in other years, an issue of NSS – IIT Kharagpur newsletter, “Anuraag,” was published on this day for distribution amongst guests. Unit 10 helped organize the annual sports meet at Chhattishgarh High School, Ayma on this day.
Blood donation camp / April 5, 2014 / BC Roy Technology Hospital, IIT Kharagpur	The Annual Blood Donation Camp was organized by NSS, IIT Kharagpur on April 12 in IIT campus with the joint help of BC Roy Technology Hospital, IIT Kharagpur and Kharagpur Voluntary Blood Donors’ Association. The blood bank collected total 120 units.
Annual Day, NSS – IIT Kharagpur / April 12, 2014 / IIT Kharagpur	The day was marked by distribution of best volunteer certificates to 35 work groups of 15 units of NSS – IIT Kharagpur by Professor PP Chakrabarti, Director, IIT Kharagpur and Professor Rajendra Singh, Dean (UGS), IIT Kharagpur. 1 <sup>st</sup> year volunteers of Units 3 (gold medalists), 15 (silver medalists) and 4 (bronze medalists), also received their medals from Professors Chakrabarti and Singh for their performance of in the last NSS Annual Camp at Ayma, Kharagpur. Chandrasekhar Memorial Scholarship (instituted by Professor Jacob Chacko and his students in memory of one of Professor Chacko’s students) to six Class XI students was given away by Professor Jacob Chacko of IIT Kharagpur. The celebration was concluded by a cultural program by school children from villages / slums, where NSS – IIT Kharagpur operate.



## **Institute Information Cell**

***Prof.-in-Charge: Prof. B.K. Mathur***

The Institute Information Cell has been the hub of academic information service of the Institute all round the year. In the past year, the Cell has renovated the web sites of the Institute and Online Notice-Board. The Cell also created and hosted sites of about forty conferences, seminars, workshops and short-term courses held during the past year and to be held in the next academic year. In addition to regular updating information on departmental pages, academic programmes, profiles of all faculty, halls of residences and administrative positions in the Institute

The Cell also developed additional information modules for in-house application and they can be used in any other academic organization as well. These are: on-line Faculty Self Appraisal Package, departmental Report Package, Online Voting System, Guest House Booking Package, Extension of on-line Message Board facility to the Academic Section, Training and Placement Section and Doctorates Information System. In a major development of Guest House Management, all guest houses are brought under a common operating system and online booking facility has been extended to faculty. The Cell has made available the basic information about all Institute Staff on the LAN. The Cell has also developed software for various service sections for online filling of complaints.

## Kalpana Chawla Space Technology Cell

**HEAD:** PROF. DIPANWITA ROY CHOWDHURY

**ASSOCIATED FACULTY**

**Professor**

Name	Degree	Specialization
Dr. D. R. Chowdhury	Ph.D	Cryptography and Security, VLSI
Dr. B. K. Sarkar	Ph.D	RF & Microwave Engineering
Dr. S. Sanyal	Ph.D	RF & Microwave Engineering
Dr. S. Chakraborti	Ph.D	Communication
Dr. S. S. Bandyopadhyay	Ph.D	Cryogenic Engg
Dr. K. Bandyopadhyay	Ph.D	Satellite Communication
Dr. I. Manna	Ph.D	Material
Dr. I. Sengutpa	Ph.D	Mobile Communication, VLSI
Dr. S. Banerjee	Ph.D	VLSI based embedded system design for signal/image processing , Biomedical Instrumentation
Dr. T. K. Chaki	Ph.D	Rubber
Dr. N V A Naikan	Ph.D	Reliability and Quality Engineering
Dr. Sunando Dasgupta	Ph.D	Microscale Transport Process and Microfluids
Dr. Ajay Chakrabarty	Ph.D	EMI/EMC
Dr. J. Mukhopadhyay	Ph.D	Image Processing, Medical Informatics, Bio- informatics
Dr. D. Maity	Ph.D	Seismic Analysis of Dam, Health Monitoring of Structures, Cost Effective Housing
Dr. A. S. Dhar	Ph.D	VLSI Architecture Design
Dr. G. Saha	Ph.D	Communication
Dr. T. K. Bhattacharya	Ph.D	RF MEMS

Dr. J. Datta Majumdar	Ph.D	Nano fluid based
Dr. S. Sen	Ph.D	Capacitive Sensors and MEMS, Control Allocation Fractional Order Circuits and Systems, Robust Control
Dr. P.K. Das	Ph.D	Thermal Engineering, Gas-liquid two phase flow-instrumentation and hydrodynamics, CFD for multiphase flow, Nano fluids, Thermo hydraulics of nuclear reactors, Liquid-liquid two phase flow, Experimental thermo-fluid science
Dr. J. Mukhopadhyay	Ph.D	Image processing, Medical Informatics, Bio-Informatics
Dr. P. P. Das	Ph.D	Image Processing, Software Engineering, Object-Oriented Analysis & Design, Language Translation.

**Associate Professor:**

<b>Name</b>	<b>Degree</b>	<b>Specialization</b>
Dr. C. Chakrabarty	Ph.D	Control System
Dr. S. B. Sant	Ph.D	Material
Dr. Raja Datta	Ph.D	Optical & Wireless Network
Dr. D. Chakravarty	Ph.D	Mining & Geostatics
Dr. B. Samanta	Ph.D	Mining & Geostatics
Dr. P. Mitra	Ph.D	Machine Learning, Data Mining, Information Retrieval
Dr. D. Mukhopadhyay	Ph.D	VLSI , Cryptology
Dr. A. Bhattacharya	Ph.D	RF & Microwave Engineering
Dr. M. Sinha	Ph. D	Aerospace Engineering
Dr. A. Mitra	Ph.D	Nutraceuticals & herb based medicine/Diabetology , Drug encapsulation ,Clinical Trials
Dr. Soumen Das	Ph.D	MEMS & Microsystems
Dr. I. Chakrabarti	Ph.D	VLSI Design for Image and Video Processing and Communication
Dr. Abhijit Das	Ph.D	Cryptography, Computational Number Theory

		Parallel and Distributed Implementations
Dr. Arun Chakrabarty	Ph.D	Ocean Dynamics and Ocean Circulation Modeling of the Bay of Bengal, Data Assimilation
Dr. P. Mitra	Ph.D	Machine Learning, Data Mining, Information Retrieval
Dr. N. K. Singha	Ph.D	Tailor-made polymers via Controlled Radical Polymerization, Block (AB & ABA) & graft copolymers, Smart self-healing and self-cleaning polymeric materials, Tailor-made polymer nanocomposites, Thermoplastic elastomers (TPE), Polyurethane, Tailor-made modification on elastomers.
Dr. P. Ghosh	Ph.D	Low Temperature Processes and equipment, Helium Refrigeration and liquefaction systems, Cryogenic turboexpander and expansion devices, Cryogenic storage and transfer, Thermodynamics and heat transfer of supercritical helium.
Dr. Arnab Roy	Ph.D	Aerodynamics, Computational Fluid Dynamics

**Assistant Professor:**

<b>Name</b>	<b>Degree</b>	<b>Specialization</b>
Dr. P. K. Chakraborty	Ph.D	Solid-State Science and Technology
Dr. T. K. Nandi	Ph.D	Cryogenic Engg
Dr. R. Roy	Ph.D	Numerical Computation of Wave functions
Dr. M. K. Mondal	Ph.D	Microwave circuits
Dr. Arijit De	Ph.D	EMI/EMC, RF Microwave
Dr. S. K. Varshney	Ph.D	Fiber Optics Sensors, Plasmonics, Specialty fibers photonic crystal fibers
Dr. Nilanjan Mitra	Ph.D	Physics and Mechanics of solids and fluids, Continuum Mechanics of defects in materials
Dr. Karabi Biswas	Ph.D	Sensor Design, Development of Instrumentation System, Study of Fractional Order Systems

Dr. Rajib Maity	Ph.D	Hydroclimatology, Water Resources Engineering, Stochastic Hydrology, Watershed Development, Soft Computing in Hydrology, Monsoon rainfall
Dr. Ratna Dutta	Ph.D	Attribute Based Cryptosystems and Broadcast Encryption, Key Pre-Distribution in WSN and Self-Healing, Elliptic Curves and Pairing based Cryptography, Oblivious Transfer and Private Set Intersection Protocols, Lattice-Based Cryptography, Signature and Commitment Schemes
Dr. S. S. Das	Ph.D	Broadband Mobile Communications, Physical & MAC Layer, 4G, OFDM, MIMO, Packet Scheduling, Link Adaptation, Femto Cells
Dr. S. K. Panda	Ph.D	Sheet metal forming, Hydroforming, Bulk forming, Formability test design and development, Theory of plasticity for metal forming, Laser and resistance spot welding of sheet metal
Dr. Sujoy Kumar Kar	Ph.D	Physical and Mechanical Metallurgy, Processing-Microstructure-Microtexture-Property Relationship, Materials and property modeling, Materials systems: Ti alloys and Ni based superalloys and steels for power plant applications

**Emeritus Professor:**

Name	Degree	Specialization
Dr. K. G. Naryanan	Ph.D	Microwave Engineering

**Officer:**

Name	Degree	Specialization
Dr. Saswati Ghosh	Ph.D	EMI/EMC, RF Microwave Circuit & Antenna

**Brief description of on-going activities:**

Space Technology Cell, IIT Kharagpur was renamed as Kalpana Chawla Space Technology Cell and was formally inaugurated by Chairman ISRO on 17<sup>th</sup> November 2004 this Cell has been functioning under the supervision of chairman of Space Technology Cell since June 1998. The Cell is being funded by ISRO, DRDO, CMPDIL Ranchi, etc. During the period under report the following highlights of sponsored research activities in this inside KCSTC and in different of departments of IIT Kharagpur:

1. Dual Mode Ring Resonator Bandpass Filter with wide stopband
2. Design of Wide-band, Sharp-rejection Bandpass Filters with Parallel – coupled Lines
3. Compact Bandpass Filters with Wide Controllable Fractional Bandwidth
4. Analysis of linear tapered waveguide by two approaches
5. Compact Sharp cutoff wide stopband low-pass filter using defected ground structure and spurline
6. Size Reduction and Harmonic Suppression of Microstrip Branch – Line Coupler Using Defected Ground Structure
7. On An Algorithm for Boundary Estimation of Commonly Occuring Heart Value Diseases in Time Domain
8. Log Gabor Wavelet and Maximum a Posteriori Estimation in Speaker Identification
9. A Robust Heart Sound Segmentation Algorithm for Commonly Occurring Heart Value Diseases
10. An object based coding scheme for frontal surface of defective fluted ingots
11. A Hierarchical Framework for Generic Sports Video Classification
12. Texture Classification Using a Novel, Soft-Set Theory Based Classification Algorithm
13. Performance of high rate data in wideband CDMA with correlated interferers
14. An Energy – Efficient Packet Filtering Architecture for Wireless Sensor Nodes
15. Effects of correlated interferers on packet data in presence of voice in cellular CDMA
16. Resource allocation for data in presence of voice in cellular CDMA with correlated interferers
17. Estimation of Antenna Factor of Wire Antenna as EMI Sensor Fusion
18. An Evolutionary Algorithm based approach to Automated Design of Analog and RF circuits using Adaptive Normalized Cost Functions
19. Image – based classification of Defects in Frontal Surface of Fluted Ingot
20. Impedance Calculation of Broadwall Longitudinal Slot on Rectangular Waveguide
21. Harmonic Supperssion and Miniaturization of Microstrip Branch Line Couplers
22. Method of Moment Analysis of Arbitrary Length Longitudinal Slot on Broadwall of Rectangular Waveguides
23. Analysis of Longitudinal Slot Antennas in the Broadwall of Standard and Non-standard Rectangular Waveguides
24. Planar Compact, Wideband Bandpass Filters with Wide Upper Stopband
25. Estimation of EMI from Waveguide Joints and Analysis of Thick Rectangular windows and Open-end of a Rectangular Waveguide as EMI Sensors
26. Compact Bandpass Filter for Ultra –Wide Band Communication
27. U-Shaped microstrip structure to decrease DGS resonance frequency
28. Analysis of Wire Antennas as an Element in Reflect Array Antennas
29. Theoretical Investigation of Phase Control Using Variable Length Dipole and Loaded Dipole in Reflectarray Antenna
30. Monopole Antenna Loaded with Dielectric Resonator as EMI Sensor
31. Designing Matched Filter for Imaging of Buried Objects, Water Layer and Voids within the Earth Surface & b amp; Underground Coal Mines using Electromagnetic Wave
32. Detection of Water Layer within the Earth Surface & Underground Coal Mines using Electromagnetic Wave
33. Imaging of Water Layer and buried object using Electromagnetic wave
34. Compact Wideband Bandpass Filters with Extended Upper Stopband
35. Harmonic Suppression and Size Reduction of Planar Branch Line Couplers

36. Method of Moment Analysis and Impedance Calculation of Broadwall Longitudinal Slot on Rectangular Waveguides
37. Compact Highpass Filter using Complementary Split Ring Resonator
38. Switched Beam Array Antenna for Sectorized Optimum Power Distribution into Discrete Localities of Rural Area
39. Augmentation of Anti-Jam GPS system on Moving Platform using Adaptive Array Antenna: a Low Side Lobe- Constant Radiated Power Algorithm and DOA Estimation Algorithm measuring the Deviation of Look Angle
40. Multiple Beamforming using Switched Beam Array Antenna
41. Application of Multiple Cavity Modeling Technique for Accurate Analysis of Waveguide Fed Thick Rectangular Window
42. Comparison of IE3D and CST-Microwave Studio Simulator for Planar Microwave Filter design
43. Study on the Effect of Different Shapes of Defective Ground Structures Using Finite-Difference Time-Domain Technique
44. The role of GTD in the analysis and design of Antennas on shipboard platforms
45. A Wide-band Lumped Element Compact CAD Model of Si-Based Planar Spiral Inductor for RFIC
46. Design of a 1 V Low Power 900 MHz QVCO, 19<sup>th</sup> IEEE/ACM International Conference on VLSI Design
47. High Level Synthesis of Linear Analog Systems, International Conference on Emerging Applications of IT (EAIT 2006)
48. AGC of a Hydrothermal System with Thyristor Controlled Phase Shifter in the Tie-Line
49. Texture Classification Using a Novel, Soft-Set Theory Based Classification Algorithm
50. TEM Characterization of Polyester – Urethane – Clay (3 Weight%) nanocomposite
51. Improvement of performance of planar antenna using composite dielectric. EBG, RIS, SIAD structure are used for the improvement (Gain and Bandwidth enhancement, Miniaturization)
52. Efficient permittivity and permeability, slow wave structure and its application in electromagnetic wave propagation in media
53. Numerical Analysis of periodic structure.

### **Thrust Areas**

- 1) Liquid Combustion, Propulsion and Cryogenics
- 2) Space Communications and EMI/EMC
- 3) Micromachine Sensors
- 4) Control , Navigation and Guidance
- 5) Embedded Systems and IP-Cores
- 6) Life Support Engineering
- 7) Smart Materials & Exotic Materials
- 8) Power Electronics
- 9) Space Education

10) Electronics Devices

11) Cryogenics

**SPONSORED RESEARCH** (*Sponsored by ISRO-IIT Kharagpur Cell*): 37

**INVITED LECTURES BY FACULTY MEMBERS: 6**



## **Rajbhasha Vibhag**

### **Chairman**

Prof. D. K. Gupta

### **Hindi Officer**

Dr. Rajeev Kumar Rawat

### **On Going Activities of Vibhag**

#### **Translation**

All the documents, correspondence, Institute's Annual Report and Annual Accounts statement are translated by Rajbhasha Vibhag apart from the routine translation of various technical / non technical documents, administrative orders and letters from English to Hindi and vice versa. In addition to the translation of documents, the Vibhag ensures the bilingual display of different nameplates, notice boards, rubber stamps, and preparation of Degrees / Diplomas certificates awarded by the institute.

#### **Hindi Training**

Rajbhasha Vibhag has initiated Hindi Training to Institute employees for Praveen and Pragya course under Hindi Teaching Scheme. The classes are arranged in Institute with the help of Sri K K Pathak, Hindi Pradhyapak, Hindi Teaching Scheme. Upto December 2013, 194 employees have been trained up to Pragya level.

#### **Hindi Workshops and Seminars**

With a view to create awareness for use of Hindi as Official Language in official work as well as to accelerate the pace of its progressive use, Rajbhasha Vibhag used to organize various training programmes, Workshops and Seminars for the employees / Officers of the Institute throughout the year. In the previous year 2013-14 the following events took place:-

On 16th May, 08th August, & 6th November, 2013 and 20th March, 2014, three Hindi workshops were organized for the employees. In these Dr. Rajeev Kumar Rawat, Hindi officer briefed the employees about the techniques for doing their day to day official work in Hindi and also hands-on training was given to them to be able to work on computer in hindi, noting and drafting.

#### **Celebration of HINDI DIVAS**

During the month of September, Rajbhasha Vibhag has organized "Hindi Saptah" from 10- 14th Sep 2013. Several programmes and competitions in Hindi were organised for employees and students of the Institute as well as for the students of nearby schools. Winners were motivated with certificates and hindi books as prizes.

#### **Publication**

Rajbhasha Vibhag publishes a monthly News Magazine "Jharokha" in Hindi covering all the academic, cultural, extra-curricular activities of the institute with the rules , regulations, policy matters related to Rajbhasha.

## **Resources and Achievements**

### **Softwares**

Rajbhasha Vibhag has several Hindi Softwares like i-leap, ISM Publisher, ISM Office, Leap Office etc. Vibhag also uses the tools, PARIVARTAK, MANTRA, TRANSLITERATION, etc developed by Department of Official Language , MHA, Government of India, C-DAC and other agencies. Recently ISM V.6 was procured which is Unicode compatible.

### **UNICODE**

The Vibhag has activated UNICODE in all the computers of departments and trained the employees to work in Hindi.

### **Rajbhasha Library**

Rajbhasha Vibhag has a full fledged Library with a collection of more than 1200 books of different writers on literature, fiction, poetry, prose, play and various subjects of translation and language.

### **Bilingual web site**

The Rajbhasha Vibhag has made its website bilingual. Useful information links are available on Vibhag Website regarding training programmes, incentives schemes, different tools etc. The Rajbhasha Vibhag has also made the Institute's website bilingual and efforts are being made to make the contents of the website also bilingual.

### **Committees**

#### **Official Language Implementation Committee and Progress Measurement Committee**

The Institute has constituted Official Language Implementation Committee (OLIC) for the implementation of Rajbhasha Policies and to monitor the progressive use of Hindi in the Institute in day-to-day work. A meeting of the OLIC is held quarterly and is chaired by the Director. This year the meetings were held on 18.06.2013, 26.11.13 and 13.03.2014 to discuss various issues.

#### **Town Official Language Implementation Committee (TOLIC)**

In addition to this, Rajbhasha Vibhag, IIT Kharagpur plays a vital role in co-ordination for implementing the Official Language policy in the town. As the Director of the Institute is the senior most officer of Central government in Kharagpur, Rajbhasha Vibhag, Ministry of Home Affairs, Government of India has nominated him as Chairman of Town Official Language Implementation Committee (TOLIC). All the central government offices, Banks, Corporations, Autonomous bodies and enterprises are the members of TOLIC. At present there are 49 member Offices in the committee. The committee has been assigned the task of implementing the Rajbhasha policies and ensuring the orders and directives of government. The Director, Prof. Partha P Chakraborty has nominated Prof. D. K. Gupta, Chairman/Rajbhasha Vibhag as

Executive Chairman and Dr. Rajeev Kumar Rawat, Hindi Officer as Member- Secretary of TOLIC to look after the routine work of committee. As per the calendar, the meetings of TOLIC Khargpur are fixed to be held in January and August. In the previous year two meetings were held on 20.08.2013 and 20.03.14. The meetings were chaired by the Chairman TOLIC and attended by Heads of the member offices with their Hindi Staff. Rajbhasha Vibhag invites the employees of TOLIC member offices to participate in the workshops, seminars and training programmes organized in IIT Kharagpur

## **Science & Technology Entrepreneurs' Park (STEP)**

### **NAME OF THE UNIT**

**Science & Technology Entrepreneurs' Park / Technology Business Incubators (STEP/TBI)**

### **FULL NAME OF THE CONCERNED OFFICER**

Prof. Indranil Sen Gupta

Professor, Department of Computer Science & Engineering, &

Prof-in-Charge of Incubation and Entrepreneurship Programme, SRIC &  
Managing Director, Science and Technology Entrepreneurs' Park,  
Indian Institute of Technology Kharagpur, India

### **MAJOR ACTIVITIES:**

- 1) High end TBI lab with VLSI based equipments has been established to facilitate the entrepreneurs under TBI/STEP incubation.
- 2) Infrastructure facilities created:
  - Construction of incubation facilities 13,500 sq.ft. is under process. Out of that, 4500 sq.ft. is completed and already under use at STEP, Gopali.
  - A set of twenty cubicles for the usage of Entrepreneurs have been established in the old building of STEP, IIT Kharagpur.
  - The companies can access these cubicles and avail the facilities for their design and testing.
  - Prof. Ajoy Kumar Ray, Vice Chancellor and Dr. M. K. Sanyal, professor & Head, Department HRM, Indian Institute of Engineering Science & Technology visited STEP on 28<sup>th</sup> March, 2014 for the possible collaboration on E-Cell activities and entrepreneurial programme.
  - Prof. Paul Lillrank (Aalto University, Finland) visited STEP, IIT Kharagpur in the month of January, 2014 and delivered lectures on "Quality Management for Entrepreneurial ventures" and visited Seva-Bharati School of Living, Kapgari, Jhargram, West Midnapur district of West Bengal, towards awareness camp on health delivery model. Dr. Ranjan Sen, Alumnae of IIT Kharagpur and Chaiman of Seva-Bharati School of Living visited STEP for the possible collaboration in the field of agricultural innovation & entrepreneurial activities to change the socio-economic scenario of extreme rural area of Jhargram.
- 3) TIFAC-SIDBI Technology Innovation Programme (SRIJAN): On the 10th day of January, 2014 the programme was held at STEP, IIT Kharagpur. Around 100 (hundred) innovators attended the meeting where 17 innovators have showcased their product. The scheme provides support to entrepreneurs (either start up or existing) to scale-up / commercialize new products / process based on technology innovations. Dr. P. R. Basak, Head-TIFAC/SIDBI Technology Innovation Programme, New Delhi, Mr. S. Ramakrishnan, General Manager, SIDBI, Kolkata, Prof. Indranil Sen Gupta, Managing Director, STEP, Prof. Partha Pratim Das, Head, Rajendra Mishra School of Engineering Entrepreneurship along with 5 (five) other professors of RMSoEE attended the meeting. Honorable Director of IIT Kharagpur also visited during the meeting.

- 4) **PRISM Awareness Meet:** On the 26th day of March, 2014, Dr. Ramanuj Banerjee, Scientist 'D', DSIR, New Delhi, Govt. of India, visited STEP, IIT Kharagpur to discuss the details of PRISM project. Prof. Indranil Sen Gupta, Prof. Partha Pratim Das, Prof. Basab Chakraborty, Prof. Satyahari Dey and Mr. Sumit Biswas, Assistant Registrar, SRIC were present at the meeting.
- 5) **Entrepreneurs Meet:** On March 29, 2014 an entrepreneur's meet was organized at STEP, IIT Kharagpur. Prof. Indranil Sen Gupta, as new Managing Director of STEP inaugurated the programme and addressed the entrepreneurs. He has interacted with the incubatees about the guidelines and policies of various funding programmes available through different Govt. Projects. Prof. Indranil Sen Gupta (MD, STEP), shared his experience and appreciated the step taken by the young entrepreneurs and innovators for their development. Mr. S. C. Santra (GM, STEP) explained the activities of the centre and support mechanisms for the grassroots entrepreneurs and innovators.
- 6) **PRISM Awareness Camp:** On the 29th day of March 2014, a PRISM Awareness Camp was held at STEP, IIT Kharagpur. Around 50 (fifty) innovators attended the meeting including professors of various department of IIT Kharagpur. Prof. Indranil Sen Gupta, PI of the project, discussed in details about the project and attended to all the queries made by the Innovators. Prof. Indranil Sen Gupta asked innovators to submit PRISM Proposals in a large numbers as Tepp Outreach & Cluster Innovation Centre (TOCIC), IIT Kharagpur will be happy to help the innovators in all respect.
- 7) **Faculty Development Programme (FDP):** We have successfully conducted entrepreneurship (academic and practice) based one faculty development programme (FDP) in 2013-14. Seventeen faculty members participated in the programme. The participants were taught how to start E-Cell in their respective institution, how to create courseware on entrepreneurship, and how to promote entrepreneurial activity in their corresponding areas.
- 8) **Technology based Entrepreneurship Development Programme (TEDP):** We have successfully conducted entrepreneurship (energy, environment, education & health) based two entrepreneurship development programme (TEDP) in 2013-14. Fifty one students from Science background participated in the programme. The participants were taught how to start their own business based on their own innovation.
- 9) **The Global Entrepreneurship Summit (GES):** The annual flagship event of E-Cell IIT Kharagpur unfurled in a grand style on 10 January 2014 as more than 2000 students from all over the country watched in awe. The GES summit 2014 witnessed workshops, interactive sessions and lectures from eminent personalities like Mr. Avinash Vashistha, Chairman and Geography Managing Director, Accenture India; Mr. Anil Joshi, Ex- President, Mumbai Angels; Mr. Varun Agarwal (Alma Mater), Mr. Arunachalam Muruganantham (Jayaashree Industries), Mr. Bhaskar Majumdar (Heath Ventures, IIT Kgp Alumnus), Mr. Farrhad Acidwalla (Rockstah Media), Ms. Ira Trivedi (Novelist, Entrepreneur), Ms. Devita Saraf (Vu Technologies), Mr. MN Srinivasu (Bill Desk) and Mr. Sam Pitroda (Advisor to PM, Chairman, National Innovation Council). Mr. Avinash Vashistha and Mr. Anil Joshi were the keynote speakers for the inauguration ceremony. The three day conference served as a platform for discussion of opportunities and programs for promoting entrepreneurship at IIT Kharagpur and in India on the whole and chalk out common strategies. The GES witnessed several programs and conclaves as well which were widely appreciated by the participants. Mr. Rajat Sharma Chairman and Editor-in-Chief, India TV) and Mr. Sharad Gupta (CEO, 10kya.com) were the keynote speaker at the closing ceremony.

- 10) TIETS-TIDE–Screening Committee Meeting: A screening Committee meeting, consisting of Prof. Indranil Sen Gupta, Prof. Partha Pratim Das, Prof. Satyahari Dey, Prof. Bhaskar Bhowmick and Mr. Subhash Chandra Santra, General Manager, STEP, was organized on February 7, 2014. 4(four) Start-ups of IIT Kharagpur and 1 (one) Start-up of IIT Madras have participated in the committee. Rs.17 lakh have been disbursed to two of them for product development and commercialization of their innovations.
- 11) TDB–Screening Committee Meeting: A screening Committee meeting, consisting of Prof. Indranil Sen Gupta, Prof. Partha Pratim Das, Prof. Satyahari Dey, Prof. Bhaskar Bhowmick and Mr. Subhash Chandra Santra, General Manager, STEP, was organized on February 7, 2014. 2(two) companies, formed by IIT Kharagpur students, have participated in the committee. Rs.22 lakh have been disbursed to both of them for product development and commercialization of their innovations.

### **Thrust Areas of Research**

**TBI Research:** Following fields of development are well supported and bolstered by TBI (Test/Masurement, Design and Characterization lab)

- Embedded System Design & Development (High and Low End FPGA/DSP development board) for major below application.
- Wireless Communication
- Image Processing
- Medical: Biometric passports, Active & Passive semiconductor devices design & Modeling, Low Noise receiver & Power amplifier
- Design & Development for medical instrumentation

### **Management Research:**

- Business Architecture/Business Networks for SME
- Information & Communication Technology (ICT) applications in Healthcare
- Technology Interventions of Growth Ventures
- The Education-Enterprise association for entrepreneurship through ideation, incubation and entrepreneurial integration
- Product Development Strategy for Startup Firm
- Business Intelligence for Entrepreneurial venture
- Quality of Service for SME

### **Brief descriptions of on-going entrepreneurial activities at STEP**

Total No. of companies: 84  
 STEP IIT Kharagpur Campus: 71  
 STEP Gopali Campus: 13

### **Other Assistance of Entrepreneurial Activities:**

- Entrepreneurship support through MSME grant.
- MSME IIT Kharagpur centre has funded 9 innovators and approved another 2 innovator.

**LECTURE BY VISITING EXPERT: 01**

**SEMINARS/WORKSHOPS/CONFERENCES: 07**

## Sponsored Research & Industrial Consultancy (SRIC)

The academic excellence of an educational institution stands on its research capability, where learning and innovation complement each other. IIT Kharagpur has been committed towards developing and maintaining the highest standards in both fundamental research as well as applied research. The wide variety of engineering sciences at IIT Kharagpur provides a unique environment that fosters interdisciplinary research in cutting edge technology areas, such as energy, nanotechnology, semiconductors, bioengineering, and computational sciences. The diversity of in-house expertise at IIT Kharagpur has also catalyzed the development of a healthy ecosystem for large scale industrial collaborations in multi-disciplinary areas, such as automotive control software, railways research, steel technology, petroleum and biofuels research, industrial robotics, and many more. IIT Kharagpur's research programs reach across the campus and beyond, linking together 19 departments, 16 academic centers and a large number of advanced R&D laboratories, stimulating the integration of inquiry, new knowledge, and education.

The year 2013-2014 has been a landmark for IIT Kharagpur in terms of its outreach towards ambitious science and technology missions of national importance. The new research portfolio includes the following missions:

- Food Sustainability. *This includes technology for food production, processing and distribution logistics.* This mission brings together researchers from agricultural engineering, biotechnology, operations research and industrial engineering.
- Future of Cities. *Technology for the development and maintenance of our cities. This includes building technology, road and pavement technology, waste and hygiene management, traffic, and governance.* This mission brings together researchers from civil engineering, architecture and city planning, industrial engineering, computer science, and law school.
- Signals and Systems for Life Sciences. *Technology for leveraging biometric signal processing for analysis, prognostics, diagnostics and affordable healthcare.* This mission brings together researchers from electrical, electronics and telecommunication engineering, school of medical science and technology, biochemical engineering, computer science and information technology and practicing medical professionals.
- Artificial Intelligence for Societal Needs. *Technology for knowledge discovery and intelligent decision making for solving problems in the sectors of energy, climate, water, disaster management and traffic.* This mission brings together researchers from Computer Science, electrical and energy engineering, environmental sciences, geology and geophysics, civil engineering, social sciences, and architecture.
- SANDHI-Science-Heritage and Creative Economic Projects. *Technology for preservation, archival, development and scientific exploration of our heritage.* This mission brings together researchers from architecture, social sciences, geophysical sciences, computer and information sciences, electrical sciences, and management.
- Centre for Robotics. *Technology for robotics, unmanned intelligent vehicles, intelligent exploration and surveillance, biomedical and nano-robotics.* This mission brings together researchers from mechanical engineering, mining engineering, electrical sciences, computer and information sciences, material science and architecture.

- Centre for Microfluidics. *Technology based on micro-fluidics for mechanical, biomedical, chemical and semiconductor processes*. This Centre brings together researchers from mechanical and chemical engineering, biomedical engineering, material sciences, and, computer and electrical sciences.

The above initiatives have leapfrogged the intake of research students at IIT Kharagpur and have created new exciting brands of research and career building. In yet another iconic step having historic ramifications towards promoting research excellence, the institute launched the several types of challenge grants for developing individual and collaborative research infrastructure in the institute. Seed grants towards infrastructure development for departmental and collaborative research include:

- Setting up an advanced membrane separation facility in the department of chemical engineering
- Setting up an interdepartmental bio-informatics research facility combining wet labs and computational facilities
- Development of a facility for design, development and testing of next generation telecom gears at the school of telecommunications
- Setting up an automated servo-controlled direct shear-cum-triaxial testing machine with computer control system and power pack at the department of mining engineering

New research endeavors seeded under the new challenge grants include the following:

- Plant on a chip
- Next-generation secured internet of things (IOT)
- Design, synthesis, and advanced applications of new polymers and polymer composites
- Studies on ultrafast processes for electronic, spintronic, magnonic and photonic applications

In addition to the above projects awarded to groups of researchers, 19 individual seed grants were awarded on a competitive basis to individual faculty members in various areas, and 4 high-value research grants were awarded on a competitive basis for inter-departmental collaborative research problems of strategic significance. In order to promote social awareness and for the greater benefit of the institute and its neighborhood, 15 challenge grants were awarded for research and development leading to service to the society.

The total funding received by IIT Kharagpur in the last 5 years is more than 630 Crores, through 1513 Research and Consultancy Projects. During the year 2013-2014 the Institute received from the Government, private and international funding agencies/enterprises 193 research projects for a total value of Rs. 149.31 crores and 125 consultancy projects worth Rs. 12.83 crores aggregating a total of 318 projects for Rs. 162.14 crores.

Some of the noteworthy research initiatives and collaborative research facilities created in the recent past in the institute include:

- Centre for Railway Research
- K. Sinha Centre for Bioenergy
- Tea Engineering Research Center
- Centre of Excellence in Information Assurance
- National Program in Marine Hydrodynamics
- Vodafone-Essar-IIT Kharagpur Centre of Excellence in Telecommunications
- Rural Technology Action Group (RUTAG)
- Advanced VLSI Design Laboratory
- Intel Embedded Innovation Laboratory
- Synopsys CAD Laboratory



In the past year IIT Kharagpur has received a number of high-value and flagship projects from the government and the industry, such as:

- Connectivity and role of inhibitory neurons in auditory perception
- Evaluation of the applicability of a dominant nuclear male sterility system in rice for hybrid seed production
- Measurement to Management (M2M): Improved water use efficiency and agricultural productivity through experimental sensor networks
- Slope design and stability, production and paste backfilling
- Improving groundwater levels and quality through enhanced water use efficiency
- Development of remote educational centers in Eastern India
- Post disaster situation analysis and resource management using delay tolerant peer to peer wireless networks
- Indigenous design methodologies for elliptic curve cryptography on FPGAs
- Generation of insect resistant sweet sorghum plant
- Requirements for delivering RISUG pre-loaded syringes
- Clinical decision support system and self-learning tool for radiologists for lung CT using content based image retrieval
- Design and synthesis of coordination polymers and coordination induced gelating materials exploration of gas absorption
- Fundamental studies on the reduction kinetics, heat and mass transfer during reduction of iron ore coal composite pellets in rotary hearth furnace
- Asymmetric catalysis TOS/DOS of nitrogen hetero-cycles
- A study of the operation and control of a proposed voltage source converter based HVDC transmission highway with offshore wind power integration
- A study of hybrid controllers for transmission and high voltage distribution applications
- Generation and applications of photo addressed surface gaps.
- Industrial scale investigation for the fabrication of wear resistant ceramic tiles using coal ash
- Engineered silk matrices for optimization of in-vitro 3D tumor model
- Evaporative drying assisted meso-patterning under lateral confinement
- Tuning of metal and metal oxide nanostructures for super-hydrophobicity
- High resolution Bay of Bengal circulation using adjacent point source river discharge
- Exploration of microbial diversity and function in acid mine drainage and mine tailings
- Extensional rheometer for microscale samples
- Synthesis of Al-based bulk metallic glasses composite with improved ductility via mechanical alloying and spark plasma sintering
- Study on mill tiling based composites as backfill material in uranium mines
- Improvement of energy recovery from waste water by dark fermentation followed by microbial fuel cells
- Development of membrane electrode based portable e-tongue device for rapid taste characterization of tea

The Intellectual Property Rights and Industrial Relations (IPR & IR) Cell under SRIC is responsible for the licensing and the transfer of technologies developed by researchers at IIT Kharagpur to the commercial sector. Till date, more than 400 patents were filed and more than 120 were granted and a total of 19 technologies were transferred. This year, the IPR&IR Cell under SRIC carried out a special patent drive, on the lines of the “100 Days 100 Patents” initiative of the previous year. The Institute Faculties, students and staff support and respond whole heartedly to this activity leading to submission of more than

200 abstracts. More than 100 patent applications have been sent out to patent attorneys for the filing applications to patent office under this drive.

The Entrepreneur Cell under SRIC supports a variety of incubation programs funded by the Government.

Various student activities are encouraged and supported through SRIC. Notable activities include the following:

- **TeamKART** activity for design and implementation for single seat racing car. Formula Student (FS) is Europe's most established educational motorsport competition, run by the Institution of Mechanical Engineers. It seeks to challenge university students to conceive, design, build, cost, present and compete as a team with a small single-seat racing car in a series of static and dynamic competitions. Recently IIT Kharagpur team has participated in Silverstone track in UK.
- **RoboSoccer** activity for design and implementation of a team of soccer playing robots. The Federation of International Robo-soccer Association (FIRA) arranges the FIRA cup. The team from IIT Kharagpur participated in this competition last year under the MiroSot category, where participants need to devise artificial intelligence strategies, and develop sharp sensing and precise real-time control for the physical soccer-playing robots.
- **TeamAGV** activity for design and implementation of autonomous ground vehicles. The team has participated in the Intelligent Ground Vehicle Competition (IGVC).
- **TeamAUV** activity for design and implementation of autonomous underwater vehicle. The team participated in the 3rd National Students Autonomous Vehicle competition earlier this year.

In addition to the above, students participation is also taking place in several areas of innovation such as the green policy initiative that aims to reduce the carbon footprint of the campus through technology advances.

## Technology Students Gymkhana

PRESIDENT:	Prof. Joy Sen
TREASURER:	Prof. Somesh Kumar
VICE PRESIDENT:	Sri Punj Rajan

### **Rectors' Nominee:**

1. Prof. Kingshook Bhattacharya (Sports)
2. Prof. N. K. Goyal (Sports)
3. Prof. Bhargab Maitra (Technical)
4. Prof. Arindam Basu (Technical)
5. Prof. Priyadarshi Patnaik (Soc & Cult)
6. Prof. G. Harikrishnan (Soc & Cult)

### **NAMES OF THE PHYSICAL TRAINING INSTRUCTORS**

Mondal S: B.A, B.P.Ed, M.P.Ed , Diploma in Sports Coaching in Basketball from NSNIS Patiala, Ph.D Perusing, Qualified , (BFI) National Referee 'A'

1. Kumar S: *B.Sc in Physical Education, Master in Physical Education & Sports Science*
2. Ghosh A .K: *B.A. B.P Ed, Sports Coaching in Football from NSNIS, Kolkata*
3. Gyan Swaroop: *B.P.E, M.P.E, M.Phil, Ph.D, Diploma in Sports Coaching in Hockey from NSNIS Patiala, Qualified National Referee*
4. Adrib Mitra: *B.Com (H), B.P.Ed, M.P. Ed, M. Phil*
5. Samba Kar: *B.P.Ed, M.P. Ed*
6. Pranab Sarkar: *B.A (English H) B.P.Ed, M.P. Ed*

### **DEVELOPMENTS**

The development of all-round students' activities centering TSG, IIT Kharagpur is based on the full utilization of its existing facilities; and evident in its activities in the year 2013- 14:

#### **Existing Facilities**

- Modern Gymnasium
- Billiards
- Athletics Stadium
- Two Cricket Fields with two turf wickets with jogging track along with modern practice facilities in Tata Sports Complex
- Six Tennis Courts including four flood light Courts
- Three flood light Basketball (Cemented) Courts
- Three flood light Volleyball (Cemented) Courts
- Four wooden Indoor Badminton Courts
- Table Tennis room with four tables
- Yoga room

- Standard Swimming Pool
- One Squash court

## Activities

The activities of the students of IIT Kharagpur can be summarized as follows with the allied highlights.

### Inter IIT Sports Meet

IIT Guwahati was host of 49<sup>th</sup> Inter IIT Sports Meet. The first phase of Sports Meet began with the Inter IIT Aquatic Meet held on **October 1<sup>st</sup> to 4<sup>th</sup>, 2013**. IIT Kharagpur Secured 2<sup>nd</sup> in Swimming and 3<sup>rd</sup> in water polo. Extra ordinary performance in swimming was forwarded by Sherays Mahajan, a final year UG student. Shreyas was declared as individual champion.

The second phase which includes all other games, started from December **16<sup>th</sup> to 23<sup>rd</sup> 2013**. The men section IIT Kharagpur secured in Badminton Third Position, **Basketball fetched First Position**; Cricket got Second Position; Football having Third Position; **Lawn Tennis securing Second Position**; Squash getting Fourth Position, Table Tennis having Third Position, and finally, Volleyball in Fourth Position.

Over all in 49th Inter IIT Championship IIT Kharagpur after six long years secured **overall Third Position** in men section. In Women Section, there were achievements with securing **First position in Lawn Tennis**; and Third in Badminton. Mr. Inter IIT position was secured by Nitish Balal of IIT KGP. **TSG finally felicitated to the medal winners Teams of Inter IIT Sports Meet, 2013.**

### Out-station Participation

**Basketball:** Basketball Boys and Girls Team had participated and **they stood First in IMG Reliance BFI Inter College Basketball League** held at Kolkata. **IIT Kharagpur Boys Team Secured First Position** and Girls Team Secured Third Position. Boys basketball Team qualified and subsequently participated in National Inter College Basketball league held at New Delhi, which is **the first national level participation in the history of IIT Kharagpur.**

The Basketball Team of IIT Kharagpur also participated in the Senior State Basketball (Boys & Girls) Championship which was held at West Bengal Basketball Association, Kolkata. Subsequently, IIT Kharagpur Basketball team got an affiliation from West Bengal Basketball Association.

**Cricket:** The Cricket Team of IIT Kharagpur participated in the Inter University Cricket Tournament T-20 which organized by IIT Kharagpur.

**Football:** The football team of IIT Kharagpur participated in Kharagpur football league.

**Lawn Tennis:** Lawn Tennis (Boys') Team participated in Midnapore open & Kharagpur open Tennis tournament and both the Tournament the team secured first position.

## **Inter Hall Competition in Sports & Games**

During the Autumn Semester Inter hall competition was initiated with the 6.6 Km Run. In the Spring Semester, the Second Phase of inter Hall Competition was held in Athletics, Badminton ,Basketball ,Cricket, Football ,Hockey ,Volleyball ,Table Tennis, Lawn Tennis, Squash, Weightlifting and overall, Nehru Hall won General Championship with 75 Points, followed by R.P Hall arriving at Second position with 46 Points and finally, with the Third position going to MS Hall of Residence with 41 Points. The Inter Hall Competitions among the Girl's hostels were conducted in Athletics, Basketball, Badminton, Table Tennis, Lawn Tennis, Swimming and Volleyball.

## **Inter Hall Competition in Social Culture Events**

### **General Championship social & cultural 2013-14 awarded to Azad hall of residence**

#### **Spring Fest 2014**

Spring Fest is the annual social cultural fest of IIT Kharagpur. It is conducted in the Spring Semester, during the month of January.

#### **Highlights**

- Edition: This was the 55th edition of Spring Fest edition of Spring Fest, held on 23rd-26th January 2014
- Theme: The Great Indian Carnival - 'Dil Se Desi'
- Performances: Agnee, Swarathma, Underground Authority, Salim-Sulaiman, Pentagram.
- International Carnival: Performers from various countries like Chris Cheong , a magician and mentalist from Malaysia, Jack Glatzer, a violinist from Portugal, Benny Prasad, a well travelled musician, Murray Molloy, a sword swallower from Ireland, Almost Trio, a juggling duo from Hungary and Jonathan Kay, an Indo- Jazz saxophonist from Canada.
- Footfall: 2400+ was the total footfall, the largest till date.
- Associations: Shiamak Davar Dance Academy, Anupam Kher's Actor Prepares, Naujawan-e-hind, ZIMA, IFMA, International Institute of Photography.

#### **Outstation participation and achievements by societies in Spring Fest**

- **Monkey cap:** Finalists at channel V India fest, National competition ... Top 7 out of 2000 bands ...Played on the red Bull tour bus, an international initiative by red bull to showcase the top bands of the country ...Performed in the world music fusion fiesta, calcutta alongside motherjane, sivamani, trilok gurtu ... International turnover .
- **Quizzing achievements:** Sweden India nobel memorial quiz- won kolkata regionals and nationals team : Ajay Viswanathan; Somashish Ghosh; Saswat Panigrahi
- **NDTV croma tech grandmasters:** Won 1st round: team: Yogarshi Vyas and Anirudh Deb
- **Tata Crucible: cleared zonal round - team :** Yogarshi Vyas and Saswat Panigrahi
- **Nihilanth : Rank 4India quiz Gold Team :** Kanisk Samot; Yogarshi Vyas; Arijit Patra
- **Sports Quiz: SilverTeam:** Yogarshi Vyas; Ajay Viswanatha; and Mhilesh Gurujala
- **Mela Quiz : Silver Team:** Yogarshi Vyas; Ajay Viswanathan; Somashish Ghosh

- **HTDS:** 1st in rangmanch sf 2014 , 2nd in rangmanch SF 2013; IIM cal 2014- 2nd in play, 1st in nukkad; IIM cal 2013- 2nd in nukkad
- **ETDS:** IIM Bangalore 2nd in stage play; IIT guwahati- 2nd in stage play
- **BTDS & TTDS:** no outstation
- **Technology dance society:** IIT guwahati 1st 2014
- **Technology Music Society-** ALL the monkey cap achievements no outstation other than that
- **Technology Literary Society:** Priyal Maheshwari won cash prize in thomso IIT R; -started Hindi e pulse the only Hindi literary newsletter; creative writing workshop by Sushmita Bhattacharya (writer from London)
- **Debsoc**
  - Teams or individuals from IIT Kharagpur achieved the following positions: 3 teams broke at KSOL '12 (KIT School of Law)
  - Two teams broke at VITDT'13, (VIT Debating Tournament) with one team reaching the finals.
  - Best adjudication at IITB' PD '13. (IIB parliamentary debate)
  - A team reached the semifinals at Mukherjee Memorial '14
  - Two teams broke at IITD PD '13
  - A team broke at INDC '14 (Indian National Debate Championship)
  - A team broke at NUJS '14 (National University of Juridical Sciences)
  - A team won NIT Rourkela PD '13

### **Inter Hall Competition in Technology Events**

General Championship Technology 2013-14 was awarded to Azad hall of residence

### **Kshitj 2013-14**

The Annual Tech Fest Kshitj 2013 was organized during 1st February to 4th February, 2013. The event occurred:

- Under the patronage of UNESCO
- As Asia's biggest techno management fest
- With Footfall increased from 2400 00 (50% increase)
- With major state-of-the-art Scientific Events and certifications

### **Key events were:**

- Race pulse - Institution of mechanical Engineers
- Delta Surge - Institution of mechanical Engineers
- Laws of motion- Institution of mechanical Engineers
- Overnite - Association for computing machinery (ACM)
- Eureka - IEEE
- ASME-STUDENT DESIGN EXPOSITION- ASME
- Speak Out for Engineering- Institution of mechanical Engineers
- IDP – GE
- Illuminate- E.B.A.I. , Drishti

**Principal Guest lecturers were:**

- Dougal Jerram, British geologist/earth scientist, television & media presenter/contributor, and author.
- Nawazuddin Siddiqui, Critically Acclaimed Actor
- Shazia Ilmi, Journalist , ex-anchor at Star News
- Jonathan Forman, Scientific Advisor- OPCW (Nobel Peace Prize 2013)
- Rajiv Malhotra, Author, Multi Millionaire and Philanthropist
- Amitabha Ghosh, Chairman-Mars Rover Mission
- Roel Vertegaal, Pioneer in Human-Computer Interaction

**Key Workshops were:** NVIDIA - Game Streaming ,TECHNOPHILIA Accelero-Botix ,PFI - State of City Finances, Simulating FSAE Vehicle with Adams/Car 2013, HONDA - Automotive Engineering, KLA Tencor - Semiconductor Fabrication, Investigative Journalism, MOZILLA - The Mozboot Camp, IFC - Rupee Depreciation ,TERI - Green Technologies.

**Exhibitions:** PUZZLEBOX ORBIT, MINIATURE MODELS, FACE ANDROID, TOUCHWALL, TALKING ROBOT, NAO ROBOT, PAPER TAB, SWARM ROBOTICS, FACE VIDEO MAPPING

**Megashows:**

BMX Extreme Stunts, the Acrobatics Show for Basketball and EDM Night

**Intrinsic Highlights:**

- Application Cup LLR Hall Secured First Place.
- Innovation Cup RP Hall & Azad Hall (Joint) Secured First Place
- Knowledge Cup Azad Hall Secured First Place.

**Some major highlights of Kshitij 2013-14 were:**

- Largest techno-management symposium in Asia.
- More than 50,000 participants from all over world.
- First time IIT Kharagpur conducted Computer Programmer policy and IIT Delhi secured first position, Second position secured EEE, Hyderabad, IIT, KGP secured forth position.

**Some of the flagship events of Kshitij were as follows:**

- Quizzes
- Laws of Motion
- Nightshift
- Racepulse
- Overline
- BPlan

Technology General Championship won by Nehru Hall of Residence, 2<sup>nd</sup> LLR hall of Residence and 3<sup>rd</sup> AZ Hall of Residence.

**Gymkhana Awards:**

During the annual Prize Distribution Ceremony and farewell function, 21 Players received the Institute blues, 11 Order of Merit, 8 Honorable Mention and 7 Special Mention have been awarded to the students for their outstanding achievements in Sports & Games, Social & Cultural and Technology activities.

**Other Highlights:**

Technology Students Gymkhana is active in launching a few Students' centric and participatory Cells in major Research and Development initiatives sponsored by the MHRD, Government of India. During the year 2013-14, few modules along this line of action has been opened to cater to 'The Future of Cities' initiative, projects under the Technology Robotics Society and the 'Science-Heritage' initiative called 'SanDHI'.

Important partnerships or exchanges are in the way. To name a few, Technology Students Gymkhana has developed a potential collaboration with the Cricket Association of Bengal (CAB) and the two associations look forward to organizing non-profitable matches in IIT Kharagpur and also at the regional level to augment the spirit of 'sports' amongst the Youth; another event is that of Hockey organized by Central Reserve Police Force in association with TSG.

TSG also played a major initiative in mobilizing the youth spirit of the Campus by organizing the 'Reach out week'; various adventure clubs and societies; and various spot based sports and arts activities like SPECTRA and many others.

The outgoing Students Governing body 2013-14 had rendered a significant contributive role under the leadership of past President Prof. Manish Bhattacharya and past Vice President Sri Apoorv Jain. A continued and perhaps, a greater role is expected from the new incoming flow under the governance of new Vice President elect Sri Punj Rajaan and his accompanying league of bright students. Let us wish all of them a great year of 2014-15 ahead!



## Technology Telecom Centre

**Prof-in-Charge:** Prof. Raja Datta

**Engineer:** Mr.Pankaj Gupta

### Work Carried Out

- A new facility to forward the calls coming to the office internal phones to the respective officer's cell phones has been added.
- All the rooms of Visveswaraya Guest House (CEC) has been given telephone facility.
- The internal back bone cable of the Dept. of Chemical Engg has been restructured and replaced with new cables.
- The internal backbone cable of the Dept. of Geology and Geophysics has also been restructured and replaced with new cables.
- 500 new telephone instruments have been purchased for replacing old telephones as well as to provide the new connections.
- The internal backbone telephone cabling in the newly added floor of Dept. of Biotechnology is completed.

### Ongoing Works:

- Restructuring and replacing of old internal telephone cables in the Dept. of Electrical Engg. and Dept. of Mathematics has been taken up.
- An Audio Bridging system for internal conference facility upto 30 participants will be installed in the existing exchange soon.
- Laying of cabling work is going on in the pilot project in the Dept. of Agriculture and Food Engineering.

### New Planning:

- Telephone facility to all the class rooms of Nalanda Complex has been planned.
- Laying of telephone cabling in the newly built floor of the Dept. of Industrial and Systems Engg.
- A new Satellite Exchange has been planned in the upcoming building of JCB Complex Annex building so that telephone connections can be provided to the entire JC Bose laboratory Complex as well as in the upcoming Diamond Jubilee Tower.

## CAREER DEVELOPMENT CENTRE

The Career Development Centre is responsible for arranging practical training for 3<sup>rd</sup> year B. Tech/Dual Degree and 4<sup>th</sup> year M.Sc. degree students and job placement of final year students graduating from the Institute. The Centre is actively engaged in forging synergistic relationships between the Institute and various industries and user systems of technical and scientific manpower. Based on these interactions, the CDC gives feedback to the Institute on the academic programmes.

### Summer Training Details

Eight weeks of summer practical training at the end of 3<sup>rd</sup> year B. Tech/Dual Degree and 4<sup>th</sup> year M.Sc. degree is a compulsory part of the curriculum at IIT Kharagpur, carrying 2 credits. All efforts are made to place the concerned students in the best of organizations in India and abroad for summer training through Training and Placement section and various departmental supports. An emergent trend is that more and more students are seeking summer training abroad.

A total of 1250 companies/organizations in India were contacted for training facilities for the current summer vacations in May-July 2014. Among these 78 in India had offered training facilities, out of which 48 organizations had extended out-of pocket allowances (covering 225 students) and many other extended subsidized transport, subsidized canteen, subsidized accommodation and to-and fro travel expenses (e.g. 3AC fare, air fare etc.) for our students. The highest out of pocket allowance of Rs. 60,000/- per month was paid by ITC Ltd. and Hindustan Unilever. Some other organizations such as Times Internet and American Express offered Rs. 50,000/- per month, Amazon and Adobe offered Rs. 30,000/- per month, Yahoo, Qualcomm, and Microsoft offered Rs. 20,000/- per month. There are about fifteen (15) companies offered stipend in the range Rs. 10,000/- to 20,000/- per month. In addition to the above some students arranged internship by themselves with good amount of stipend.

Out of **1282** third/fourth year B.Tech/Dual Degree/M. Sc. students, **86** students will be attending summer internship abroad in many Institutes/organizations likes EPFL, Switzerland , University of Warwick, National University of Singapore , University of Tokyo, Max Plank Institute for Software Systems, Germany University of Alberta, Biotechnology & Bio Chemical Engineering, Belgium,Rhinewall University, Germany Bremen University Dong A University, Busan , etc. and foreign companies like Finisar ,Malaysia , Mitsubishi , Works Application , Japan , during May-July, 2014.

### Placement Details

**247** companies / organizations have considered our students for employment during 2013-2014. The details of number of students who had registered for placement and those actually placed through campus interviews including those who have opted either for higher studies or arranged job through off campus as on 30.04.2014 are as follows:

Course/Degree	No. of students registered	No. of students placed
---------------	----------------------------	------------------------

B.Tech. (Hons.) & B. Arch	615	506
5-year Integrated M.Sc.	138	111
2-year M. Sc	116	58
Dual Degree (B. Tech + M. Tech.)	387	325
M.Tech./MCP	710	423
M.B.A.	70	65
MS/Ph D	18	18
Total	2054	1506

The Overseas Highest salary received in 2013-14 is \$125000 per annum and the second highest is \$100000 per annum.

The Highest salary received in INR is Rs. 36.9lakh per annum and the second highest is Rs.28.5lakh per annum in 2013-14.

Average Salary for 2013-14 is as follows.

<b>Courses</b>	<b>Average Salary ( CTC) Rs. Lakhs per annum)</b>
B. Tech.& B. Arch	10.98
Dual Degree	11.69
5yr. Integrated M.Sc.	10.75
2yr. M.Sc.	7.05
M. Tech.	8.60
MS/ Ph.D	6.93
Average Salary for all UG & PG Courses	9.81
VGSOM ( MBA )	11.78

Some companies have offered pre placement offers like ITC Ltd., Schlumberger, Hindustan Unilever, Qualcomm, Barclay's Capital, etc. Total numbers of Pre-Placement offers received are 113.

### **Student Participation**

Career Development Centre at IIT Kharagpur has taken an initiative to harness the students' management skills through a formal system during the placement season since 2005-2006. The system has progressed extremely well and from year 2010 onwards, the CDC has immensely benefitted from students participating in placement process. The organizational skill of students has helped CDC to conduct 12-15 companies' placement interviews per day and round the clock. During the placement season students play an active role from contacting the companies to the final selection at campus by providing complete logistic support.

## WATER WORKS SECTION

**PROFESSOR –IN-CHARGE: Prof. M M Ghangrekar**

**Officer: B B Rai, Executive Engineer**

**On-going works / Job:**

Annual repair and maintenance in connection with plumbing and water supply at Academic Campus for the year 2014 -15.
Annual repair and maintenance in connection with plumbing and water supply at Old Residential Campus for the year 2014 -15.
Annual repair and maintenance in connection with plumbing and water supply at New Residential Campus for the year 2014 -15.
Annual repair and maintenance in connection with plumbing and water supply at VS, BC ROY, MS, MT, Gokhale , AM, SN&IG,RK, RP, BF -1&3, RLB Halls for the year 2014 -15.
Annual repair and maintenance in connection with plumbing and water supply at MMM, Patel, Azad, Nehru, HJB, JCB, LLR, ZH Halls for the year 2014 -15.
Annual maintenance of main water pipelines from Anicut & Balarampur Pumphouse for the year 2014 -15.
Operation & Maintenance of Balarampur Pump house for the year 2014 -15
Laying of 150 mm & 100mm dia. DI main water pipeline from UGPH to JC Ghosh & PC Roy Lab
Surging of few existing deep tube wells inside campus & Anicut Pump House
Construction of a Mini Deep tube well with main distribution water line at Tata Sports Complex
Construction of a Mini Deep tube well at Ambedkar Hostel including its inlet line
Construction of one Deep tube well near Anicut Pump House No.- 1
Installation of New Iron Removal Plant & repair of existing plant at Deep tube wells near Gas Godown & VSRC
Water line connection & Sinks at all rooms of the newly constructed building of Metallurgical and Materials Engg. Dept.

# *Statistics*

Table A-1

## ADMISSION TO UNDERGRADUATE (B.TECH./B.ARCH./M.SC./DUAL DEGREE) COURSES IN THE SESSION 2013-2014

Sl. No.	Course	SANCTIONED STRENGTH					ADMISSION OFFERED					ACTUALLY REGISTERED				
		GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL
<b>(A) B.TECH. 4-YEAR</b>																
1	Aerospace Engg	16	9	5(1)	2	<b>32</b>	16	9	4	2	<b>31</b>	16	9	4	2	<b>31</b>
2	Agril. & Food Engg.	17(1)	9	5	3	<b>34</b>	16	9	5	3	<b>33</b>	16	9	5	3	<b>33</b>
3	Biotech. & Bioch. Engg.	14(1)	7	4	2	<b>27</b>	13	7	4	2	<b>26</b>	12	7	4	2	<b>25</b>
4	Chemical Engg.	26	14(1)	8(1)	4	<b>52</b>	26	13	8	4	<b>51</b>	26	13	8	4	<b>51</b>
5	Civil Engg.	31(1)	17	9	5(1)	<b>62</b>	31	17	9	5	<b>62</b>	31	17	9	5	<b>62+1*</b>
6	Computer Sc. & Engg.	28	15(1)	8	4	<b>55</b>	28	15	8	4	<b>55</b>	28	15	8	4	<b>55</b>
7	Electrical Engg.	28(1)	15(1)	8	4	<b>55</b>	28	15	8	4	<b>55</b>	28	15	8	4	<b>55</b>
8	Electronics & ECE	31	17(1)	9	5(1)	<b>62</b>	31	17	9	4	<b>61</b>	31	17	9	4	<b>61</b>
9	Industrial Engg.	15(1)	8	4	2	<b>29</b>	14	8	4	2	<b>28</b>	14	8	4	2	<b>28</b>
10	Instrumentation Engg.	16(1)	9	5	2	<b>32</b>	16	9	5	2	<b>32</b>	16	9	5	2	<b>32+1*</b>
11	Manuf. Sc. & Engg.	15	8	4	2	<b>29</b>	15	8	4	2	<b>29</b>	15	8	4	2	<b>29+1*</b>
12	Mechanical Engg.	34	18(1)	10	5	<b>67</b>	34	18	10	5	<b>67</b>	34	18	10	5	<b>67</b>
13	Met. & Mat. Engg.	22(1)	12(1)	7	3	<b>44</b>	21	11	7	3	<b>42</b>	21	11	7	3	<b>42+1*</b>
14	Mining Engg.	20	11	6	3	<b>40</b>	20	11	6	3	<b>40</b>	20	11	6	3	<b>40</b>
15	Ocean Engg. & N.A.	17(1)	9	5(1)	2	<b>33</b>	16	9	5	2	<b>32</b>	16	9	5	2	<b>32+1*</b>
<b>Total (A)</b>		<b>330</b>	<b>178</b>	<b>97</b>	<b>48</b>	<b>653</b>	<b>325</b>	<b>176</b>	<b>97</b>	<b>47</b>	<b>644</b>	<b>324</b>	<b>176</b>	<b>96</b>	<b>47</b>	<b>643</b>

Table A-1 (Continued)

Sl. No.	Course	SANCTIONED STRENGTH					ADMISSION OFFERED					ACTUALLY REGISTERED				
		GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL
<b>(B) B.ARCH. 5-YEAR</b>																
1	Architecture	25(1)	13(1)	8	4	<b>50</b>	25	10	8	1	<b>44</b>	25	10	7	1	<b>43</b>
<b>Total (B)</b>		25(1)	13(1)	8	4	<b>50</b>	25	10	8	<b>1</b>	<b>44</b>	25	10	7	<b>1</b>	<b>43</b>
Sl. No.	Course	SANCTIONED STRENGTH					ADMISSION OFFERED					ACTUALLY REGISTERED				
		GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL
<b>(C) M.Sc. INTEGRATED 5-YEAR</b>																
1	Applied Geology	18	10	5	3	<b>36</b>	18	10	5	0	<b>33</b>	13	10	2	0	<b>25</b>
2	Chemistry	17(1)	9	5	3	<b>34</b>	17	9	5	1	<b>32</b>	11	4	4	1	<b>20</b>
3	Economics	22(1)	12(1)	7	3	<b>44</b>	22	12	7	0	<b>41</b>	21	12	7	0	<b>40</b>
4	Maths. & Computing	24(1)	13(1)	7	4	<b>48</b>	23	13	7	4	<b>47</b>	23	13	7	3	<b>46</b>
6	Physics	18(1)	10	5	3	<b>36</b>	18	10	5	0	<b>33</b>	18	10	5	0	<b>33</b>
7	Expl Geophysics	17	9	5	3	<b>34</b>	17	9	5	0	<b>31</b>	17	8	2	0	<b>27</b>
<b>Total (C)</b>		116	63	34	19	<b>232</b>	115	63	34	5	<b>217</b>	103	57	27	4	<b>191</b>

Table A-1(Continued)

Sl. No.	Course	SANCTIONED STRENGTH					ADMISSION OFFERED					ACTUALLY REGISTERED					
		GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL	GN	OB	SC	ST	TOTAL	
<b>(D) DUAL DEGREE 5-YEAR</b>																	
1	Aerospace Engg.		10	5	3(1)	1	19	10	5	3	1	19	10	5	3	1	19
2	AG & F.E./Water Res. Dev. & Management		17(1)	9	5(1)	3	34	17	9	5	3	34	16	8	5	3	32
3	Biotech. & Biochem. Engg.		13	7	4(1)	2	26	13	7	4	2	26	12	7	4	2	25+1*
4	Chemical Engg.		14(1)	7	4	2	27	13	7	4	2	26	13	7	4	2	26
27	Civil engg./Struct. Engg.		11	6(1)	3	2	22	11	5	3	2	21	11	5	3	2	21
6	Computer Sc. & Engg.		20(1)	11	6	3	40	20	11	6	3	40	20	11	6	3	40
7	Elect. Engg./Instru. Engg.		11(1)	6	3	2	22	11	6	3	2	22	11	6	3	2	22+1*
8	E&ECE / Auto. & Comp. vision		20(1)	11	6	3	40	20	11	6	3	40	20	11	6	3	40
9	Industrial Engg. /IEM		12(1)	5	4	1	22	11	5	4	1	21	11	5	4	1	21
10	Manuf. Sc. & Engg./IEM		7	4	2	1	14	7	4	2	1	14	7	4	2	1	14
11	(i) M.E./M.S.Engg. (ii) M.E./Thermal, Energy & Environ. Engg.		24(1)	13	7	4(1)	48	24	13	7	4	48	24	13	7	4	48+1*
12	Met. & Mat. Engg./Met. Engg.		10	5	3	1	19	10	5	3	1	19	10	5	3	1	19
13	Mining Engg.		10	5	3	1	19	10	5	3	1	19	10	5	3	1	19
14	Mining Engg. / Safety Engg. & Disaster Mgt. in Mines		9	5	3	1	18	9	5	3	1	18	9	5	3	1	18
15	Ocean Engg. & naval Arch.		11	5	4	2	22	11	5	4	2	22	11	5	4	2	22+1*
16	QED&M		7	4(1)	2	1	14	7	4	2	1	14	6	4	2	1	13
<b>Total (D)</b>			206	108	62	30	406	204	107	62	30	403	201	106	62	30	399
<b>Total (A + B + C + D)</b>			677(20)	362(11)	201(6)	101(3)	1341(40)	669	356	200	83	1308	653	349	192	82	1276+(9)*

(1)-Figures in () indicates PD candidate. \* Preparatory student



Table A2

## ADMISSION TO 2-YEAR M.SC. COURSES, 2013-2014

Sl. No.	Course	OFFERED					REGISTERED					NOT REGISTERED				
		GE	OB	SC	ST	TOTAL	GE	OB	SC	ST	TOTAL	GE	OB	SC	ST	TOTAL
1	Chemistry	21	13	8	4	46	21	11	7	4	43		2	1		3
2	Geophysics					-					-					-
3	Geological Sciences	13	10	5	2	30	13	10	5	2	30					-
4	Mathematics	16	8	5	1	30	15	8	3	1	27	1		2		3
5	Physics	17	16	9	4	46	14	16	9	4	43	3				3
6	Statistics & Informatics															
<b>TOTAL</b>		<b>67</b>	<b>47</b>	<b>27</b>	<b>11</b>	<b>152</b>	<b>63</b>	<b>45</b>	<b>24</b>	<b>11</b>	<b>143</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>-</b>	<b>09</b>

**Table A-3**

DISCIPLINE-WISE BREAK-UP OF STUDENTS AWARDED M.C.M. SCHOLARSHIP 2013-2014

Rate of Scholarship : Rs.1000/- p.m. plus Free-tuitionship

S.N.	Course	1 <sup>st</sup> yr.	2 <sup>nd</sup> yr.	3 <sup>rd</sup> yr.	4 <sup>th</sup> yr.	5 <sup>th</sup> yr.	Total
<b>(A) B.Tech. 4-Year</b>							
1	Aerospace Engg.	14	14	03	03-	-	<b>34</b>
2	Agri. & Food Engg.	06	05	04	07	-	<b>22</b>
3	Biotech. & Bioch. Engg.	02	03	03	04	-	<b>12</b>
4	Civil Engg.	20	12	13	19	-	<b>64</b>
5	Chemical Engg.	06	07	11	10	-	<b>34</b>
6	Computer Sc. & Engg.	12	18	12	14	-	<b>56</b>
7	Electronics & ECE	21	19	17	18	-	<b>75</b>
8	Electrical Engg	16	15	10	16	-	<b>57</b>
9	Industrial Engg.	08	08	06	06	-	<b>28</b>
10	Instrumentation Engg.	09	08	09	05	-	<b>31</b>
11	Mechanical Engg.	21	20	17	15	-	<b>73</b>
12	Manuf. Sc. & Engg	05	04	02	05	-	<b>16</b>
13	Mining Engg.	17	06	09	08	-	<b>40</b>
14	Met. & Mat. Engg.	13	05	13	06	-	<b>37</b>
15	Ocean Engg. & N.A.	10	06	04	06	-	<b>26</b>
<b>(B) B.Arch. 5-Year</b>							
	Architecture	06	08	04	07	05	<b>30</b>
<b>(C) M.Sc. Integrated 5-Year</b>							
1	Chemistry	01	-	-	01	-	<b>02</b>
2	Expl. Geophysics	07	-	01	02	-	<b>10</b>
3	Applied Geology	06	02	01	-	-	<b>09</b>
4	Economics	07	04	10	03	-	<b>24</b>
5	Maths. & Computing	03	-	04	-	-	<b>07</b>
6	Physics	02	-	03	-	-	<b>05</b>
<b>Total</b>							<b>692</b>

Contd...

Contd... Table A-3

S.N.	Course	1 <sup>st</sup> yr.	2 <sup>nd</sup> yr.	3 <sup>rd</sup> yr.	4 <sup>th</sup> yr.	5 <sup>th</sup> yr.	B/F : 692
<b>(D) M.Sc. 2-Year</b>							
1	Chemistry						
2	Geophysics						
3	Geological Sciences						
4	Mathematics						
5	Physics						
<b>(E) Dual Degree 5-Year</b>							
1	Aerospace Engg.	06	06	05	06		<b>23</b>
2	Ag. & F. E./ Water Res. Dev. & Manag.	07	04	04	03		<b>18</b>
3	Biotech. & Bioch. Engg.	05	06	01	07		<b>19</b>
4	Chemical Engg.	05	04	03	08		<b>20</b>
5	Civil Engg./Struct. Engg.	02	06	04	04		<b>16</b>
6	Computer Sc. & Engg./Comp. & Information Technology	13	11	08	13		<b>45</b>
7	Electrical Engg./Instrumentation Engg.	08	06	04	07		<b>25</b>
8	E & ECE/Automation & Comp. Vision	11	11	05	12		<b>39</b>
9	Industrial Engg./IEM.	05	06	03	04		<b>18</b>
10	Mech., Engg.	14	19	07	10		<b>50</b>
11	Manuf. Sc. & Engg.	02	05	02	02		<b>11</b>
12	Met. & Mat. Engg./ Metallurgical Engg.	02	-	07	05		<b>14</b>
13	Mining Engineering	10	05	10	09		<b>34</b>
15	Ocean Engg. & N.A.	01	02	03	04		<b>10</b>
16	Q E D M	05	01	03	-		<b>09</b>
	<b>TOTAL:</b>	<b>308</b>	<b>256</b>	<b>225</b>	<b>249</b>	<b>05</b>	<b>1043</b>

Table A-4

**STUDENTS AWARDED ONLY FREE TUITIONSHIP 2013-14**

( Applicable to Genl. &amp; OBC students only)

S.N.	Course	1 <sup>st</sup> yr.	2 <sup>nd</sup> yr.	3 <sup>rd</sup> yr.	4 <sup>th</sup> yr.	5 <sup>th</sup> yr.	Total
<b>(A) B.Tech. 4-Year</b>							
1	Aerospace Engg.	01	01	04	-	-	<b>06</b>
2	Agri. & Food Engg.	03	01	06	-	-	<b>10</b>
3	Biotech. & Bioch. Engg.	02	03	01	01	-	<b>07</b>
4	Chemical Engg.	03	03	02	-	-	<b>08</b>
5	Civil Engg.	07	05	01	-	-	<b>13</b>
6	Computer Sc. & Engg.	05	01	03	01	-	<b>10</b>
7	Electrical Engg.	02	03	02	02	-	<b>09</b>
8	Electronics & ECE	01	05	04	02	-	<b>12</b>
9	Industrial Engg.	01	01	06	02	-	<b>10</b>
10	Instrumentation Engg.	02	04	01	03	-	<b>10</b>
11	Manuf. Sc. & Engg.	02	02	03	-	-	<b>07</b>
12	Mechanical Engg.	04	01	04	05	-	<b>14</b>
13	Met. & Mat. Engg.	05	04	01	-	-	<b>10</b>
14	Mining Engg.	05	05	-	-	-	<b>10</b>
15	Ocean Engg. & N.A.	01	03	04	02	-	<b>10</b>
16	Q E D M	-	-	-	-	-	-
<b>(B) B.Arch. 5-Year</b>							
	Architecture	04	04	-	-	-	<b>08</b>
<b>(C) M.Sc. Integrated 5-Year</b>							
1	Applied Geology	03	-	-	-	-	<b>03</b>
2	Economics	07	06	01	-	-	<b>14</b>
3	Expl. Geophysics	03	01	-	-	-	<b>04</b>
4	Chemistry	01	-	-	-	-	<b>01</b>
5	Maths. & Computing	01	-	-	-	-	<b>01</b>
6	Physics	03	01	-	-	-	<b>04</b>
<b>Total:</b>							<b>181</b>

Contd.....

Contd... Table A-4

S.N.	Course	1 <sup>st</sup> yr.	2 <sup>nd</sup> yr.	3 <sup>rd</sup> yr.	4 <sup>th</sup> yr.	5 <sup>th</sup> yr.	B/F: 181
<b>(D) M.Sc. 2-Year</b>							
1	Chemistry						
2	Geophysics						
3	Geological Sciences						
4	Mathematics						
5	Physics						
6	Statistics & Informatics						
<b>(E) Dual Degree 5-Year</b>							
1	Aerospace Engg.	02	01	-	01	-	04
2	Ag. & F. E../ Water Res. Dev. & Manag.	03	03	01	02	-	09
3	Biotech. & Bioch. Engg.	01	-	01	-	-	02
4	Chemical Engg.	03	03	03	05	-	14
5	Civil Engg./Struct. Engg.	02	03	01	-	-	06
6	Computer Sc. & Engg./Comp. & Information Technology	01	-	03	-	-	04
7	Electrical Engg./Instrumentation Engg.	04	05	02	02	-	13
8	E & ECE/Automation & Comp. Vision	01	02	01	01	-	05
9	Industrial Engg./IEM.	-	01	-	01	-	02
10	QUDM	01	-	-	-	-	01
11	Manuf. Sc.& Engg.	01	-	-	-	-	01
12.	M.E./M.S. Engg.	03	01	05	04	-	13
13	M.E./Thermal, Energy & Environ. Engg.						
14	Met. & Mat. Engg./ Metallurgical Engg.	03	02	-	01	-	06
15	Mining Engineering	10	02	-	-	-	12
16	Mining Engg./Safety Engg. & Disaster Mgt in Mines						
17	Ocean Engg. & N.A.	05	01	03	-	-	09
	Total:	106	78	63	35	-	282

**Table A-5**

STUDENTS (SC & ST) AWARDED FINANCIAL ASSISTANCE 2013-2014

Rate: Pocket Allowance Rs.250/- p.m. plus Free Messing

Sl.No.	Course	1 <sup>st</sup> yr.		2 <sup>nd</sup> yr.		3 <sup>rd</sup> yr.		4 <sup>th</sup> yr.		5 <sup>th</sup> yr.		Total
		SC	ST	SC	ST	SC	ST	SC	ST	SC	ST	
<b>(A) B.Tech. 4-Year</b>												
1	Aerospace Engg.											
2	Agri. & Food Engg.			1	1		1		1			4
3	Biotech. & Bioch. Engg.											
4	Chemical Engg.											
5	Civil Engg.	1							1			2
6	Computer Sc. & Engg.											
7	Electrical Engg.											
8	Electronics & ECE		1					1				2
9	Energy Engg.											
10	Industrial Engg.								1			1
11	Instrumentation Engg.											
12	Manuf. Sc. & Engg.						1					1
13	Mechanical Engg.							2	1			3
14	Met. & Mat. Engg.					1			1			2
15	Mining Engg.	1			1				1			3
16	Ocean Engg. & N.A.											
<b>(B) B.Arch. 5-Year</b>												
	Architecture			1	1		2					4
	Preparatory	1	3									4

**Table A-5 (Contd.)**

Sl.No.	Course	1 <sup>st</sup> yr.		2 <sup>nd</sup> yr.		3 <sup>rd</sup> yr.		4 <sup>th</sup> yr.		5 <sup>th</sup> yr.		Total
		SC	ST	SC	ST	SC	ST	SC	ST	SC	ST	

**(C) M.Sc. Integrated 5-Year**

1	Applied Geology											
2	Economics						2					2
3	Expl. Geophysics			1								1
4	Industrial Chemistry		1									1
5	Maths. & Computing											
6	Physics											
7	Statistics & Informatics							1				1

**(D) M.Sc. 2-Year**

1	Chemistry	4	3	1								8
2	Geophysics											
3	Geological Sciences	3										3
4	Mathematics	3										3
5	Physics	2			1							3
6	Statistics & Informatics											

**(E) Dual Degree 5-Year**

1	Aerospace Engg.											
2	Ag. & F. E./ Water Res. Dev. & Manag.		1		1			2				4
3	Biotech. & Bioch. Engg.											

4	Chemical Engg.								1					1
5	Civil Engg./Struct. Engg.													
6	Computer Sc. & Engg./ Comp. & Information Technology													
7	Electrical Engg./ Instrumentation Engg.													
8	E & ECE/Automation & Comp. Vision													



MEDALS AND PRIZES : 2013 – 2014 : UNDER-GRADUATE1. **INSTITUTE GOLD MEDALS :**

Sl. No.	Name of Medal/Prize	Name of the winner	Instt.Roll No.	CGPA
1.	PRESIDENT OF INDIA GOLD MEDAL	Lakshya Jain	10ME10024	9.63
2.	DR. BIDHAN CHANDRA ROY MEMORIAL GOLD MEDAL	Lakshya Jain	10ME10024	9.63
3.	PRIME MINISTER OF INDIA GOLD MEDAL	Ahanjit Bhattacharya	09CY2001	9.64
4.	DR. JNAN CHANDRA GHOSH MEMORIAL GOLD MEDAL	Chander Chandak	09EC3517	9.16
5.	PROF. J. C. BOSE MEMORIAL GOLD MEDAL	Saparya Chattaraj	12CY40032	9.56

2. **ENDOWMENT GOLD MEDALS:**

Sl. No.	Name of Medal/Prize	Name of the winner	Instt. Roll No.	CGPA
1.	ANUKUL CHANDRA SARKAR MEMORIAL GOLD MEDAL	Samir Kumar Jena	10CE10047	9.04
2.	PROF. R. G. CHATTERJEE MEMORIAL GOLD MEDAL	Sarthak Subhankar	09PH2028	8.95

3. **SILVER MEDALS :**A. **4-YEAR B. TECH.(HONS.) COURSES :**

Sl. No.	DEPARTMENTS	Name of the winner	Instt Roll No.	CGPA
1.	Aerospace Engineering	Bhatt Mrugank Pranav	10AE10006	9.04
2.	Agricultural & Food Engineering	Desam Gnana Prasuna Reddy	10AG10008	8.81
3.	Biotechnology & Biochemical Engineering	Vinay Patel	10BT10028	9.09
4.	Civil Engineering	Samir Kumar Jena	10CE10047	9.04
5.	Computer Science & Engineering	Yelam Anil Kumar	10CS10056	9.58
6.	Electrical Engineering	K. Nagaraju	10EE10059	9.16
7.	Instrumentation Engineering	Saqub Ahmad	10IE10034	8.70
8.	Electronics & Electrical Comm. Engineering	Paturi Rohit	10EC10039	9.28
9.	Industrial & Systems Engineering	Dhawal Thakkar	10IM10014	9.31

10	Mechanical Engineering	Lakshya Jain	10ME10024	9.63
11	Manufacturing Science & Engineering	Ayan Hazra	10MF10007	9.02
12	Metallurgical & Materials Engineering	Kunwar Akash Singh	10MT10023	9.34
13	Mining Engineering	Ankit Gupta	10MI10006	8.68

**5-YEAR B. ARCH.(HONS.) COURSE :**

SI. No.	DEPARTMENTS	Name of the winner	Instt Roll No.	CGPA
1.	Architecture	Nishant Vats	09AR1014	8.89

**5-YEAR DUAL DEGREE COURSES :**

SI. No.	DEPARTMENTS	Name of the winner	Instt Roll No.	CGPA
1.	Aerospace Engineering (AE1)	Atanu Halder	09AE3017	8.91
2.	Agricultural & Food Engineering (AG1)	Arpit Rohatgi	09AG3207	9.37
3.	Biotechnology & Biochemical Engineering (BT1)	Vegesna Neeraja CCCC	09BT3005	9.09
4	Chemical Engineering(CH1)	Kaushik Sivaramakrishnan	09CH3026	9.09
5	Civil Engineering(CED)	Kamalendu Ghosh	09CE3112	8.97
6	Computer Science & Engineering (CS2)	Ananth Balashankar	09CS3035	9.60
7	Electrical Engineering (EED)	Sanjukta Nandi	09EE3512	9.23
8	Electronics & Electrical & Comm. Engineering (ECD)	Soumya Basu	09EC3401	9.58
9	Industrial & Systems Engineering (IM1)	Ashutosh Nayak	09IM3014	9.05
10	Mechanical Engineering (MED)	Prateek Sehgal	09ME3209	9.53
11	Manufacturing Sc.& Engg (MFI)	Soudagar Abdul Khaja Irfan Babu	09MF3008	8.72
12	Mining Engineering (MI1)	R. Ashwin Kumar	09MI3040	9.27
13	Ocean Engineering & Naval Architecture(NA1)	Joseph D Thekinen	09NA3022	9.19

**D. M. SC. (5-YEAR) COURSES :**

SI. No.	COURSES	Name of the winner	Instt Roll No.	CGPA
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1.	Chemistry	Ahanjit Bhattacharya	09CY2001	9.64
2.	Exploration Geophysics	Tripti Kumari	09EX2018	8.74
3.	Applied Geology	Parinay Jain	09GG2010	8.98
4.	Economics	Abhishek Jadon	09HS2010	9.22
5	Mathematics & Computing	Meghanath M Y	09MA2028	8.66
6	Physics	Sarthak Subhankar	09PH2028	8.95

#### E. M. SC. (2-YEAR) COURSES

Sl. No.	DEPARTMENTS	Name of the winner	Instt Roll No.	CGPA
1.	Chemistry	Saparya Chattaraj	12CY40032	9.56
2.	Geology	Soumadip Das	12GG40027	9.51
3.	Mathematics	Meraj Alam	12MA40012	9.43
4.	Physics	Siddhartha Gupta	12PH40039	9.54

#### 3. ENDOWMENT PRIZES - (UNDER GRADUATE)

Sl. No.	Name of Prize	Name of the winner	Instt Roll No.	CGPA	Amount Rs.
1.	Sarat Memorial Prize	Anamika Chowdhury	10CH10003	9.19	500.00
2.	Suhasini Devi Memorial Prize	Anamika Chowdhury	10CH10003	9.19	500.00
3	P. K Bhattacharya Memorial Prize	Jointly : Tripti Kumari Parinay Jain	09EX2018 09GG2010	8.74 8.98	250.00 250.00
4	Sachinandan Basak Memorial Prize	Rajorshi Paul	12ME10074	9.31	500.00
5	Amlan Sen Memorial Prize	Lakshya Jain	10ME10024	9.63	1,000.00
6	Swapan Kumar Saha Memorial Prize	Paturi Rohit	10EC10039	9.28	1,000.00
7	Medury Bhanumurthy Memorial Prize	Anamika Chowdhury	10CH10003	9,19	350.00
8	H. N. Bose Memorial Prize	Sarthak Subhankar	09PH2028	8.95	3,000.00
9	Sharmila Bose	Tripti Kumari	09EX2018	8.74	3,000.00

	Memorial Prize				
10.	Bigyan Sinha Memorial Prize	Yelam Anil Kumar	10CS10056	9.58	1,000.00
11.	Usha Martin Award	Neelu Sheoran	10MT10028	8.56	1,000.00
12.	Systems Society Award	Mayank Sharma	10EE10058	8.98	2,500.00
13.	Prof.K.L.Chopra Award	Surendra Karwa	09CY2020	8.37	1,000.00
14.	Charubala Devi Memorial Prize	Sikhar Patranabis	11CS10044	9.83	1000.00
15.	Gouri Basak Design Award	Souradeep Paul	10AR10043	8.18	1,000.00
16.	Prof. Prabodh Chandra Sanyal Award	Tushar Gupta	09MA2018	8.45	1,000.00
17.	B. L. Nagpal Memorial Prize	Rajeev Choudhary	11CE31013	9.16	2,000.00
18.	Umesh Kumar Bhatia Sports Priz	Rahul Koshal	10IM30022	7.39	1000.00
19.	Pradeep Kumar Chakraborty Award	Arijit Mitra	11MT3EP17	9.24	1,000.00
20.	G. B. Mitra Award	Ahanjit Bhattacharya	09CY2001	9.64	1,000.00
21.	Bhartiya Cutler Hammer Prize	Harit Bansal	11EE32001	9.70	3,000.00
22.	Mansara Prize	Tangudu Sweeya Panduranganadhara o	10AR10044	9.22	1,000.00
23.	R. M. Lalwani Prize	Abhisek Datta	10PH20002	9.84	1,000.00
24.	H. P. Bhadury Memorial Prize	Ashish Daga	11ME32006	9.43	1,500.00
25.	John Von Neuman Award	Sikhar Patranabis	11CS10044	9.83	2,500.00
26.	Prof. S. K. Nandi Memorial Prize	K.Aadithya	11CH10054	9.36	500.00

27.	International Symposium ( Microwave & Comm. ) 1981 Prize	Tanvi Ranjan	11EC30034	9.63	3,000.00
28.	Class Of 1970 Alumni (US) Association Prize	Vardaan Pahuja	12EC10067	9.75	2,500.00
29.	Technology Alumni Association(Delhi Chapter) Award	Sidhartha Satapathy	13CH10047	9.96	1,500.00
30.	IIT Kharagpur Alumni (California Chapter) Award	Vardaan Pahuja	12EC10067	9.75	3,000.00
31.	Ram Gopal Kabre Memorial Prize	Kuppu Sundara Karthikeyan	12AR10026	8.85	1,000.00
33.	K. Rama Rao Endowment Prize	Challoju Hemanth Aditya	11AG10014	8.54	2,500.00
34.	Smt. Ava Sanyal Memorial Prize	Arijit Mitra	11MT3EP17	9.24	2,500.00
35.	Prof. B.N. Avasthi Memorial Award For Sports	Monish Kumar	12CH30018	7.70	2,500.00
36.	Prof. Sunil Kanti Sen Memorial Award	Naitik Jain	13MF10020	8.76	4,000.00
37.	Prof. Sudhir Ranjan Sengupta Memorial Prize	Saikat Dan	10CE31011	9.22	2,000.00
38.	Best B.Tech. Project Thesis Award By Mr. Mitrajit Mukhopadhyay	1 <sup>st</sup> –Kanjakhja Pal 2 <sup>nd</sup> –Saurabh Goel 3 <sup>rd</sup> –Nilanjon Naskar	10CH30035 10CH10061 10CH30015	9.39 7.78 8.90	25,000.00 15,000.00 10,000.00
39.	A. A. Hakim Memorial Endowment Prize	Arpit Rohatgi	09AG3207	9.37	2,500.00
40.	Keshab K Parhi Endowment Prize	Ananth Balashankar	09CS3035	9.60	15,000.00
41.	Nilanjan Ganguly	Siddhartha Satpathi	10EC34001	9.26	10,000.00

	Memorial Award For E&E.C.E. Deptt				
42.	Nilanjan Ganguly Memorial Award For Physics Deptt	Sarthak Subhankar	09PH2028	8.95	10,000.00
43.	Kedar Nath Singh Memorial Prize	Sarthak Subhankar	09PH2028	8.95	6,400.00
44.	Dwaraka Nath Singh Memorial Prize	Prateek Sehgal	09ME3209	9.53	6,400.00
45.	Jugal Kishore Singh Memorial Prize	Lakshya Jain	10ME10024	9.63	6,400.00
46	Rajender Kumar Khanna Memorial Award	K. Nagaraju	10EE10059	9.16	10,000.00
47	Ramneek Sodhi Memorial Award	Kunwar Akash Singh	10MT10023	9.34	10,000.00
48	Sushil Kumar Chowdhury Memorial Award	Bhatt Mrugank Pranav	10AE10006	9.04	7,000.00
49	Ashim Ranjan Guha Memorial Award	Desam Gnana Prasuna Reddy	10AG10008	8.81	7,000.00
50	TKT Srikrishnan Endowment Prize	G,Neeraj Krishna	10ME33008	9.02	20,000.00
51.	Prof. J.P.Ghose Memorial Award	Joseph D Thekinen	09NA3022	9.19	10,000.00
52	Sikharini Nag Memorial Award	Lakshya Jain Shaik Vaseem Akram	10ME10024 09ME3213	9.63 9.17	20,000.00 20,000.00
53	Sikharini Nag Memorial Award for Girl Student	Tanvi Ranjan	11EC30034	9.63	20,000.00

**5 J. C. GHOSH MEMORIAL PRIZE**

1.	Aerospace Engineering	Rishita Das	11AE30024	9.27	2,000.00
2.	Agricultural & Food Engineering	Nayan Mallick	11AG32008	8.80	2,000.00

3	Biotechnology & Biochemical Engg	Kaustav Bera	11BT30010	9.33	2,000.00
4	Chemical Engineering	K.Aadithya	11CH10054	9.36	2,000.00
5	Civil Engineering	Rajeev Choudhary	11CE31013	9.16	2,000.00
6	Computer Science & Engineering	Sikhar Patranabis	11CS10044	9.83	2,000.00
7	Electrical Engineering	Harit Bansal	11EE32001	9.70	2,000.00
8	Instrumentation Engineering	Proloy Das	11IE10034	9.42	2,000.00
9	Electronics & Elect. Commu. Engineering	Tanvi Ranjan	11EC30034	9.63	2,000.00
10	Industrial and Systems Engineering	Sayanti Pal	11IM10031	8.99	2,000.00
11	Mechanical Engineering	Ashish Daga	11ME32006	9.43	2,000.00
12	Metallurgical & Materials Engineering	Arijit Mitra	11MT3EP17	9.24	2,000.00
13	Mining Engineering	Vishal Agrawal	11MI10038	8.81	2,000.00
14	Ocean Engineering & Naval Architecture	Rahul Jindal	11NA10028	9.15	2,000.00
15	Chemistry	Manisit Das	10CY20015	8.67	2,000.00
16	Exploration Geophysics	Adesh Pandey	10EX20004	8.64	2,000.00
17	Physics	Abhisek Datta	10PH20002	9.84	2,000.00
18	Economics (HS)	Amrut Tripathy	10HS20006	9.32	2,000.00

5. **BEST PROJECT AWARD :**

**A 4-YEAR B. TECH.(HONS.) COURSES :**

Sl. No.	Department	Name of the winner	Instt Roll No.	CGPA	Amount Rs.
1.	Aerospace Engineering	Ravish Verma	10AE30015	8.81	1,000.00
2.	Agricultural & Food Engineering	Nadella Tejaswi	10AG10021	7.74	1,000.00
3	Biotechnology & Biochemical Engg	Vinay Patel	10BT10028	9.09	1,000.00
4	Chemical Engineering	Anamika Chowdhury	10CH10003	9.19	1,000.00

5	Civil Engineering	Pushpal Mazumder	10CE31001	8.57	1,000.00
6	Computer Science & Engineering	Shabhat Shakeel	10CS10040	9.07	1,000.00
7	Electrical Engineering	Nitin Kumar Singh	10EE10029	8.54	1,000.00
8	Instrumentation Engineering	Sourya Dey	10IE10024	8.62	1,000.00
9	Industrial and Systems Engineering	Prashant Shekhar	10IM10022	8.09	1,000.00
10	Electronics & Elect. Comm. Engineering	Susnata Mondal	10EC32015	9.61	1,000.00
11	Mechanical Engineering	G.Neeraj Krishna	10ME33008	9.02	1,000.00
12	Manufacturing Science & Engineering	Khalid Abdullah Quidwai	10MF10031	8.49	1,000.00
13	Metallurgical & Materials Engineering	Abhinav Gupta	10MT30002	8.77	1,000.00
14	Mining Engineering	Bonthalakoti Teja	10MI10011	7.59	1,000.00
15	Mining Engineering (MI1)	T.Nagendra Leela Nirup	10MI31019	8.10	1,000.00
16	Mining Engineering (MI2)	Praneel Jain	10MI32014	8.67	1,000.00
17	Ocean Engg & Naval Architecture	Ankit	10NA30005	8.20	1,000.00

**B. 5-YEAR B. ARCH. (HONS.) COURSE :**

Sl. No.	Name of Deptt.	Name of the winner	Instt Roll No.	CGPA	Amount Rs.
1.	Architecture & Regional Planning	Nishant Vats	09AR1014	8.89	1,000.00

**C. 5-YEAR DUAL DEGREE COURSES :**

Sl. No.	Name of Deptt.	Name of the winner	Instt Roll No.	CGPA	Amount Rs.
1	Aerospace Engineering (AE1)	U.Umesh	09AE3001	8.77	1,000.00
2	Agricultural & Food Engineering (AG1)	Arpit Rohatgi	09AG3207	9.37	1,000.00



3	Biotechnology & Biochemical Engg (BT1)	Ravella Dheeraj	09BT3011	7.49	1,000.00
4	Chemical Engineering (CH1)	Puppala Prathyusha	09CH3008	8.94	1,000.00
5	Civil Engineering (CED)	Kamalendu Ghosh	09CE3112	8.97	1,000.00
6	Computer Science & Engineering (CS2)	Ananth Balashankar	09CS3035	9.60	1,000.00
7	Electrical Engineering (EED)	Tamanna Singh	09EE3502	9.04	1,000.00
8	Electronics & Elect. Commu. Engineering(ECD)	Soumya Basu	09EC3401	9.58	1,000.00
9	Industrial & Systems Engineering (IM1)	Mohd Arshad Naeem	09IM3015	8.77	1,000.00
10	Mechanical Engineering (ME1)	Sahil Gupta	09ME3120	8.78	1,000.00
11	Mechanical Engineering (ME2)	Nikhil Desai	09ME3211	8.81	1,000.00
12	Mechanical Engineering (ME3)	Shah Arth Navneetkumar	09ME3304	8.77	1,000.00
13	Manufacturing Science & Engineering (MF1)	Soudagar Abdul Khaja Irfan Babu	09MF3008	8.72	1,000.00
14	Metallurgical & Materials Engineering (MT1)	Aditya Nema	09MT3006	8.44	1,000.00
15	Mining Engineering (MI1)	R.Ashwin Kumar	09MI3040	9.27	1,000.00
16	Ocean Engg & Naval Architecture (NA1)	Joseph D Thekinen	09NA3022	9.19	1,000.00

**D. 5-YEAR M. SC. COURSES :**

Sl. No.	Name of Deptt.	Name of the winner	Instt Roll No.	CGPA	Amount Rs.
1	Chemistry	Ahanjit Bhattacharya	09CY2001	9.64	1,000.00
2	Exploration Geophysics	Tripti Kumari	09EX2018	8.74	1,000.00
3	Applied Geology	Parinay Jain	09GG2010	8.98	1,000.00
4	Economics	Ankit Bhatia	09HS2016	8.85	1,000.00
5	Mathematics & Computing	Vishal Raj	09MA2026	7.68	1,000.00
6	Physics	Sourabh Kumar	09PH2022	8.61	1,000.00

**E. 2-YEAR M. SC. COURSES :**

<b>Sl. No.</b>	<b>Name of Deptt.</b>	<b>Name of the winner</b>	<b>Instt Roll No.</b>	<b>CGPA</b>	<b>Amount Rs.</b>
1	Chemistry	Saparya Chattaraj	12CY40032	9.56	1,000.00
2	Geology	Wriju Chowdhury	12GG40031	8.56	1,000.00
3	Mathematics	Gurmeet Kaur	12MA40006	9.09	1,000.00
4	Physics	Siddhartha Gupta	12PH40039	9.54	1,000.00

Table : A-7  
**UG STUDENTS AWARDED SCHOLARSHIP BY EXTERNAL AGENCIEIS**  
 During the 2013-14

( Government or Private )

Sl. No.	Awarding Organization	No. of Recipients
1.	National Council of Educational Research & Training, Sri Aurobinda Marg, New Delhi 16	16
2.	INSPIRE Scholarship awarded by Department of Science & Technology, Govt. of India, New Delhi to the students of 5-Yr. Int. M.Sc.Course(Science stream only) ( Fresh(1 <sup>st</sup> Year): 78 + Renewal : 442 ( from 2 <sup>nd</sup> Yr, to 5 <sup>th</sup> Yr.)	520
3.	Rajarshee Shahu Maharaj Merit Scholarship, Director of Social Welfare, Maharashtra State, Pune.	08
4.	CSR- Balmer Lawrie Scholarship under CSR Initiative of Balmer Lawrie & Co. Ltd. Kolkata For SC/ST /PC students.	14
5.	SAIL Scholarship being awarded by Steel Authority of India Ltd. through Vishakhapatnam Steel Plant 06 Nos. + 01 through Rourkela Steel Plant	07
6.	Aditya Birla Scholarship, Aaditya Birla Group, Aditya Birla Management Corporation, Mumbai ( 1 No. Fresh + 3 Nos. Renewal)	04
7.	Jagadish Chandra Bose National Talent Search, Calcutta (JBNSTS) ( 16 Nos. Fresh - 1 <sup>st</sup> Year + 21 Nos. Renewal from 2 <sup>nd</sup> year onwards)	37
	OPJEM Scholarship being awarded by Zindal Trust , New Delhi	03
	Indian Oil Corporation Ltd., Delhi	03
8.	BOEING Scholarship to the students of Aero Space Engg. Department from the ongoing Research Project "Boeing University Relations"(BUR) sponsored by Boeing Company, U.S.A	10
9.	Scholarship under Scheme (Trust Fund) for Differently Abled Students being awarded by National Handicapped Finance & Development Corporation, Faridabad.	03
10.	KVPY Scholarship, IISc, Bangalore	30
11.	FAEA Scholarship to BPL Cat. SC/ST students being awarded by Foundation for Academic Excellence & Access, New Delhi.	21
12.	Post Matric Scholarship to SC/ST students , awarded through different District Welfare Officers in A.P. State Govt. of Anhdra Pradesh	01
13.	Directorate of Technical Education, Chattisgarh	01
14.	INLAKS Scholarship being awarded by INLAKS Foundations, New Delhi	02
15.	ST Scholarship awarded by Sinapore Technologies Eng.. Ltd., to students of Computer Science Engg. and O.E. & Naval. Arch.	09
16.	Joint. M.Sc. Ph. D Scholarship being awarded by this Institute to the students admitted to this Programme( 2- Year M..Sc.) Fresh 1 <sup>st</sup> Year: 94 Nos. + Renewal 2 <sup>nd</sup> Year: 80 Nos.	174
17.	PG Indira Gandhi Scholarship for Single Girl Child being awarded by UGC, New Delhi to the students of Joint. M.Sc. Ph. D programme ( 2-Year M.Sc.)	01
	Total :	864

**Table A-8**

STUDENTS FROM FOREIGN COUNTRIES ON ROLL OF UNDERGRADUATE COURSES,  
CLASS WISE, 2013 – 2014

Sl.No.	Course	1 <sup>st</sup> yr.	2 <sup>nd</sup> yr.	3 <sup>rd</sup> yr.	4 <sup>th</sup> yr.	5 <sup>th</sup> yr.	Total
<b>(A) B.Tech. 4-Year</b>							
1	Aerospace Engg.	-	-	-	-	-	-
2	Agri. & Food Engg.	-	-	-	-	-	-
3	Biotech. & Bioch. Engg.	-	-	-	-	-	-
4	Chemical Engg.	-	-	-	-	-	-
5	Civil Engg.	-	-	-	-	-	-
6	Computer Sc. & Engg.	-	-	-	-	-	-
7	Electrical Engg.	-	-	-	-	-	-
8	Electronics & ECE	-	-	-	-	-	-
9	Energy Engg.	-	-	-	-	-	-
10	Industrial Engg.	-	-	-	-	-	-
11	Instrumentation Engg.	-	-	-	-	-	-
12	Manuf. Sc. & Engg.	-	-	-	-	-	-
13	Mechanical Engg.	-	-	-	-	-	-
14	Met. & Mat. Engg.	-	-	-	-	-	-
15	Mining Engg.	-	-	-	-	-	-
16	Ocean Engg. & N.A.	-	-	-	-	-	-
<b>(B) B.Arch. 5-Year</b>							
	Architecture	-	-	-	-	-	-
<b>(C) M.Sc. Integrated 5-Year</b>							
1	Applied Geology	-	-	-	-	-	-
2	Economics	-	-	-	-	-	-
3	Expl. Geophysics	-	-	-	-	-	-
4	Industrial Chemistry	-	-	-	-	-	-
5	Maths. & Computing	-	-	-	-	-	-

**Table A-8 (Contd.)**

Sl.No.	Course	1 <sup>st</sup> yr.	2 <sup>nd</sup> yr.	3 <sup>rd</sup> yr.	4 <sup>th</sup> yr.	5 <sup>th</sup> yr.	Total
6	Physics	-	-	-	-	-	-
7	Statistics & Informatics	-	-	-	-	-	-
<b>(D) M.Sc. 2-Year</b>							
1	Chemistry	-	-	-	-	-	-
2	Geophysics	-	-	-	-	-	-
3	Geological Sciences	-	-	-	-	-	-
4	Mathematics	-	-	-	-	-	-
5	Physics	-	-	-	-	-	-
6	Statistics & Informatics	-	-	-	-	-	-
<b>(E) Dual Degree 5-Year</b>							
1	Aerospace Engg.	-	-	-	-	-	-
2	Ag. & F. E../ Water Res. Dev. & Manag.	-	-	-	-	-	-
3	Biotech. & Bioch. Engg.	-	-	-	-	-	-
4	Chemical Engg.	-	-	-	-	-	-
5	Civil Engg./Struct. Engg.	-	-	-	-	-	-
6	Computer Sc. & Engg.	-	-	-	-	-	-
7	Electrical Engg./Instrumentation	-	-	-	--	-	-
8	E & ECE/Automation & Comp. Vision	-	--	-	-	-	-
9	Industrial Engg./IEM	-	--	-	-	-	-
10	Manuf. Sc.& Engg./IEM	-	-	-	-	-	-
11	M.E./M.S. Engg.	--	-	-	-	-	-
12	M.E./Thermal, Energy & Environ. Engg.	-	-	-	-	-	-
13	Met. & Mat. Engg./ Metallurgical Engg.	-	--	-	-	-	-
14	Mining Engineering	-	-	-	-	-	-
15	Mining Engg./Safety Engg. & Disaster Mgt in Mines	-	-	--	-	-	-
16	Ocean Engg. & N.A.	-	-	-	-	-	-
<b>Total:</b>							

Table A - 9

## STATEMENT OF RESULTS (UNDERGRADUATE) 2013-2014

S.No.	Course	1st yr.		2nd yr.		3rd yr.		4th yr.		5th yr.		
		P	I	P	I	P	I	P	I	P	I	
<b>(A)</b>												
<b>B.Tech</b>												
1	AEROSPACE ENGINEERING	27	1	26	5	11	7	21	5	0	0	<b>103</b>
2	AGRICULTURAL AND FOOD ENGINEERING	22	7	23	9	21	6	22	3	0	0	<b>113</b>
3	BIOTECHNOLOGY	14	7	17	8	16	1	15	0	0	0	<b>78</b>
4	CHEMICAL ENGINEERING	43	6	44	10	43	6	48	5	0	0	<b>205</b>
5	CIVIL ENGINEERING	50	7	46	14	32	6	50	5	0	0	<b>210</b>
6	COMPUTER SCIENCE & ENGINEERING	58	4	58	11	51	5	53	6	0	0	<b>246</b>
7	ELECTRICAL ENGINEERING	60	3	51	11	51	7	57	4	0	0	<b>244</b>
8	ELECTRONICS & ELECTRICAL COMMUNICATION ENGG.	67	3	62	4	61	7	57	6	0	0	<b>267</b>
9	INDUSTRIAL AND SYSTEMS ENGINEERING	23	2	22	6	17	5	28	0	0	0	<b>103</b>
10	INSTRUMENTATION ENGINEERING	32	4	26	6	35	1	35	2	0	0	<b>141</b>
11	MANUFACTURING ENGINEERING	24	2	18	7	18	5	25	2	0	0	<b>101</b>
12	MECHANICAL ENGINEERING	72	2	62	13	54	11	55	7	0	0	<b>276</b>
13	METALLURGICAL & MATERIALS ENGINEERING	35	4	36	5	27	5	30	2	0	0	<b>144</b>
14	MINING ENGINEERING	33	4	24	15	24	6	29	1	0	0	<b>136</b>
15	OCEAN ENGG AND NAVAL ARCHITECTURE	23	5	25	6	18	10	21	2	0	0	<b>110</b>
<b>Total(A)</b>		<b>583</b>	<b>61</b>	<b>540</b>	<b>130</b>	<b>479</b>	<b>88</b>	<b>546</b>	<b>50</b>	<b>0</b>	<b>0</b>	<b>2477</b>
<b>(B)</b>												
<b>B.Arch</b>												

1	ARCHITECTURE AND REGIONAL PLANNING	36	5	37	8	24	19	24	19	32	4	<b>208</b>
<b>Total(B)</b>		<b>36</b>	<b>5</b>	<b>37</b>	<b>8</b>	<b>24</b>	<b>19</b>	<b>24</b>	<b>19</b>	<b>32</b>	<b>4</b>	<b>208</b>
<b>(C) M.Sc(2yr)</b>												
1	CHEMISTRY	44	0	39	0	0	0	0	0	0	0	<b>83</b>
2	GEOLOGY & GEOPHYSICS	30	0	27	0	0	0	0	0	0	0	<b>57</b>
3	MATHEMATICS	26	1	29	0	0	0	0	0	0	0	<b>56</b>
4	PHYSICS	39	3	46	1	0	0	0	0	0	0	<b>89</b>
<b>Total(C)</b>		<b>139</b>	<b>4</b>	<b>141</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>285</b>
<b>(D) M.Sc(5yr)</b>												
1	CHEMISTRY	15	3	19	5	18	3	14	1	15	1	<b>94</b>
2	EXPLORATION GEOPHYSICS	24	2	26	4	27	6	17	5	26	1	<b>138</b>
3	GEOLOGY & GEOPHYSICS	20	2	17	16	28	3	21	2	25	1	<b>135</b>
4	HUMANITIES & SOCIAL SCIENCES	36	1	38	10	30	6	27	3	22	0	<b>173</b>
5	MATHEMATICS	50	4	48	5	42	11	32	15	32	2	<b>241</b>
6	PHYSICS	23	3	26	9	18	8	20	1	20	1	<b>129</b>
7	STATISTICS AND INFORMATICS	0	0	0	0	0	1	0	1	2	0	<b>4</b>
<b>Total(D)</b>		<b>168</b>	<b>15</b>	<b>174</b>	<b>49</b>	<b>163</b>	<b>38</b>	<b>131</b>	<b>28</b>	<b>142</b>	<b>6</b>	<b>914</b>
<b>(E) Dual Degree</b>												
1	AEROSPACE ENGINEERING	15	3	14	6	23	6	25	2	19	0	<b>113</b>
2	AGRICULTURAL AND FOOD ENGINEERING	25	3	25	7	33	7	25	4	25	0	<b>154</b>
3	BIOTECHNOLOGY	18	5	20	4	23	2	25	1	25	0	<b>123</b>
4	CHEMICAL ENGINEERING	29	1	24	5	33	3	34	3	26	4	<b>162</b>
5	CIVIL ENGINEERING	17	3	19	2	31	3	25	6	20	0	<b>126</b>
6	COMPUTER SCIENCE & ENGINEERING	43	1	39	12	39	7	42	4	40	3	<b>230</b>
7	ELECTRICAL ENGINEERING	24	0	21	4	29	3	28	5	23	4	<b>141</b>
8	ELECTRONICS & ELECTRICAL COMMUNICATION ENGG.	42	2	38	10	36	6	48	10	40	4	<b>236</b>

9	INDUSTRIAL AND SYSTEMS ENGINEERING	19	4	21	4	23	4	28	3	26	1	<b>133</b>
10	INSTRUMENTATION ENGINEERING	0	0	1	0	0	0	0	0	1	0	<b>2</b>
11	MANUFACTURING ENGINEERING	11	2	11	4	12	2	14	4	21	0	<b>81</b>
12	MECHANICAL ENGINEERING	50	3	49	5	56	10	56	13	46	8	<b>296</b>
13	METALLURGICAL & MATERIALS ENGINEERING	18	1	15	6	23	2	26	1	17	0	<b>109</b>
14	MINING ENGINEERING	29	6	25	10	39	4	36	1	30	0	<b>180</b>
15	OCEAN ENGG AND NAVAL ARCHITECTURE	20	2	13	5	18	12	19	4	20	2	<b>115</b>
16	QUALITY ENGINEERING DESIGN AND MANUFACTURING - INDUSTRIAL ELECTRONICS VERTICAL	6	0	6	0	4	2	0	0	0	0	<b>18</b>
17	QUALITY ENGINEERING DESIGN AND MANUFACTURING - MECHANICAL ENGINEERING VERTICAL	7	0	3	3	5	1	0	0	0	0	<b>19</b>
<b>Total(E)</b>		<b>373</b>	<b>36</b>	<b>344</b>	<b>87</b>	<b>427</b>	<b>74</b>	<b>431</b>	<b>61</b>	<b>379</b>	<b>26</b>	<b>2238</b>
<b>Total(A+B+C+D+E)</b>		<b>1299</b>	<b>121</b>	<b>1236</b>	<b>275</b>	<b>1093</b>	<b>219</b>	<b>1132</b>	<b>158</b>	<b>553</b>	<b>36</b>	<b>6122</b>



Table A-10

STUDENTS ON ROLL (Department wise)– UNDERGRADUATE (B.TECH/B.ARCH./M.SC./DUAL DEGREE) COURSES AT THE BEGINNING OF THE SESSION 2013 – 2014

Sl. No.	Course	1 <sup>st</sup> yr.		2 <sup>nd</sup> yr.		3 <sup>rd</sup> yr.		4 <sup>th</sup> yr.		5 <sup>th</sup> yr.		Total
		M	F	M	F	M	F	M	F	M	F	
<b>(A) B.Tech. 4-Year</b>												
1	Aerospace Engg.	26	3	31	0	18	0	27	0	-	-	105
2	Agri. & Food Engg.	25	6	28	4	20	7	19	6	-	-	115
3	Biotech. & Bioch. Engg.	17	4	21	4	14	3	12	5	-	-	80
4	Chemical Engg.	44	5	46	9	40	9	45	9	-	-	207
5	Civil Engg.	50	8	56	4	35	3	50	5	-	-	211
6	Computer Sc. & Engg.	58	4	63	6	54	3	56	5	-	-	249
7	Electrical Engg.	87	12	85	9	87	9	92	8	-	-	389
8	Electronics & ECE	67	5	57	9	59	10	53	10	-	-	270
9	Industrial Engg.	23	2	28	1	18	3	26	2	-	-	103
11	Mechanical Engg.	96	3	97	4	83	5	83	7	-	-	378
12	Met. & Mat Engg.	36	4	31	10	29	3	30	4	-	-	147
13	Mining Engg.	38	2	39	0	30	0	30	0	-	-	139
14	Ocean Engg. & N.A.	27	1	27	4	28	0	23	1	-	-	111
<b>TOTAL (A):</b>		<b>594</b>	<b>59</b>	<b>609</b>	<b>64</b>	<b>515</b>	<b>55</b>	<b>546</b>	<b>62</b>			<b>2504</b>
<b>(B) B.Arch. 5-Year</b>												
	Architecture	31	14	39	8	36	6	31	12	28	8	213
<b>TOTAL (B):</b>		<b>31</b>	<b>14</b>	<b>39</b>	<b>8</b>	<b>36</b>	<b>6</b>	<b>31</b>	<b>12</b>	<b>28</b>	<b>8</b>	<b>213</b>
<b>(C) M.Sc. Integrated 5-Year</b>												
1	Chemistry	13	5	16	8	15	6	15	0	9	7	94
2	Geology	47	2	60	5	60	3	39	6	47	6	275
3	Humanities & Social Sc	26	10	44	4	27	9	21	9	17	5	172

Sl. No.	Course	1 <sup>st</sup> yr.		2 <sup>nd</sup> yr.		3 <sup>rd</sup> yr.		4 <sup>th</sup> yr.		5 <sup>th</sup> yr.		Total
		M	F	M	F	M	F	M	F	M	F	
4	Maths.	52	2	46	9	43	10	47	2	34	2	247
5	Physics	25	1	35	0	26	3	19	2	18	3	132
<b>TOTAL (C):</b>		<b>163</b>	<b>20</b>	<b>201</b>	<b>26</b>	<b>171</b>	<b>31</b>	<b>141</b>	<b>19</b>	<b>125</b>	<b>23</b>	<b>920</b>
<b>(D) M.Sc. 2-Year</b>												
1	Chemistry	34	10	32	8	-	-	-	-	-	-	84
2	GG	22	9	21	5	-	-	-	-	-	-	57
3	Mathematics	21	8	22	7	-	-	-	-	-	-	58
4	Physics	32	12	45	3	-	-	-	-	-	-	92
<b>TOTAL (D):</b>		<b>109</b>	<b>39</b>	<b>120</b>	<b>23</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>291</b>
<b>(E) Dual Degree 5-Year</b>												
1	Aerospace Engg.	19	0	19	2	24	5	27	0	19	1	116
2	Ag. & F. E..	25	6	30	2	34	6	22	7	21	5	158
3	Biotech. & Bioch. Engg.	19	5	15	10	15	10	21	5	21	4	125
4	Chemical Engg.	27	3	27	2	34	2	35	2	26	4	162
5	Civil Engg./Struct. Engg.19	19	1	17	4	33	2	26	4	17	3	126
6	Computer Sc. & Engg./ Comp. & Information Technology	43	2	50	2	43	3	43	3	43	1	233
7	Electrical Engg./ Instru. Engg.	22	2	23	3	31	1	29	4	26	3	144
8	E & ECE	38	6	39	9	35	7	48	10	38	7	237
9	Industrial and System Engg./IEM	36	1	32	5	36	3	30	1	47	1	192
10	Mechanical Engg.	66	1	65	4	79	2	86	1	51	3	358
11	Met. & Mat. Engg./ Metallurgical Engg.	17	2	19	2	24	1	25	2	15	2	109
12	Mining Engg.	38	0	34	1	43	0	37	0	30	0	183
13	Ocean Engg. & N.A.	20	3	19	0	29	2	23	0	21	1	118
<b>Total (E):</b>		<b>389</b>	<b>32</b>	<b>389</b>	<b>46</b>	<b>460</b>	<b>44</b>	<b>452</b>	<b>39</b>	<b>375</b>	<b>35</b>	<b>2261</b>
<b>TOTAL (A+B+C+D+E)</b>		<b>1286</b>	<b>164</b>	<b>1358</b>	<b>167</b>	<b>1182</b>	<b>136</b>	<b>1170</b>	<b>132</b>	<b>528</b>	<b>66</b>	<b>6189</b>

**TABLE – B-1 ADMISSION TO POSTGRADUATE COURSES IN 2013-2014**

Deptt./ Centre	Specialisation	Sanctioned	Admit.	Regular	SP	QIP	DF	GN	SC	ST	PD	OBC	M	F
AE	Aerospace Engineering	24	09	09	00	00	00	04	02	00	00	03	09	00
AG	Farm Machinery & Power (AG1)	19	16	16	00	00	00	09	02	01	00	04	14	02
	Land & Water Resources Engineering (AG2)	18	15	15	00	00	00	07	03	01	00	04	11	04
	Food Process Engineering (AG3)	30	29	27	02	00	00	15	05	00	00	09	17	12
	Agricultural Biotechnology (AG4)	20	19	19	00	00	00	11	03	01	00	04	12	07
	Aquacultural Engineering (AG5)	18	08	08	00	00	00	02	03	00	00	03	06	02
	Agricultural Systems & Management (AG6)	19	10	10	00	00	00	06	00	01	00	03	05	05
AT	Embedded Controls and Software	12	08	08	00	00	00	02	02	00	00	04	06	02
BT	Biotechnology and Biochemical Engineering	24	23	23	00	00	00	13	03	00	00	07	13	10
CH	Chemical Engineering	75	54	54	00	00	00	27	08	03	00	16	43	11
CE	Hydraulic & Water Resources Engineering (CE1)	20	06	06	00	00	00	02	02	00	00	02	06	00
	Transportation Engineering (CE2)	20	15	14	01	00	00	09	03	01	00	02	13	02
	Environmental Engineering and Management (CE3)	18	05	05	00	00	00	01	02	00	00	02	03	02
	Geotechnical Engineering (CE4)	18	11	10	01	00	00	07	02	00	00	02	10	01
	Structural Engineering (CE5)	20	15	14	01	00	00	08	02	01	00	04	12	03
CS	Computer Science & Engineering	37	37	31	00	02	04	20	06	02	00	09	32	05
CR	Cryogenic Engineering	21	05	05	00	00	00	02	01	00	00	02	05	00
CL	Earth System Science and Technology	31	12	12	00	00	00	09	00	00	00	03	11	01
EE	Machine Drives and Power	18	15	14	01	00	00	06	02	00	00	07	14	01

	Electronics (EE1)													
	Control System Engineering (EE2)	18	09	08	00	00	01	05	03	00	00	01	09	00
	Power and Energy System (EE3)	18	10	08	00	01	01	03	03	00	00	04	09	01
	Instrumentation Signal Processing (EE4)	18	12	10	01	00	01	04	05	00	00	03	11	01
EC	Microelectronics and VLSI Design (EC2)	29	25	23	00	01	01	13	02	02	00	08	24	01
	RF and Microwave Engineering (EC3)	28	13	13	00	00	00	03	02	00	00	08	11	02
	Telecommunication Systems Engineering (EC4)	28	19	16	01	01	01	12	03	00	00	04	19	00
	Visual Information and Embedded Systems Engineering (EC5)	28	25	23	00	00	02	14	05	02	00	04	19	06
ET	Media and Sound Engineering	15	00	00	00	00	00	00	00	00	00	00	00	00
GG	Exploration Geosciences (GG1)	24	00	00	00	00	00	00	00	00	00	00	00	00
IM	Industrial Engineering and Management	25	05	04	01	00	00	03	00	01	00	01	04	01
IT	Information Technology	30	09	06	00	01	02	06	00	03	00	00	06	03
MM	Medical Imaging and Informatics	15	00	00	00	00	00	00	00	00	00	00	00	00
MS	Materials Science and Engineering	29	09	08	00	00	01	04	00	01	00	04	05	04
MA	Computer Science and Data Processing	34	22	22	00	00	00	12	04	00	00	06	22	00
ME	Manufacturing Science and Engineering (ME1)	26	15	15	00	00	00	08	03	02	00	02	14	01
	Thermal Science and Engineering (ME2)	33	28	27	00	00	01	14	02	02	00	10	27	01
	Mechanical System Design (ME3)	44	36	33	00	00	03	20	05	02	00	09	35	01
MT-1	Metallurgical & Materials Engineering	54	36	35	00	00	01	18	07	02	00	09	30	06
MI	Mining Engineering	22	13	13	00	00	00	07	02	01	00	03	13	00
NA	Ocean Engineering and Naval Architecture	20	12	09	00	00	03	06	01	00	00	05	12	00
PH	Solid State Technology	25	00	00	00	00	00	00	00	00	00	00	00	00

ID	Infrastructure Design and Management	31	24	24	00	00	00	13	02	02	00	07	23	01
RE	Reliability Engineering	20	07	02	00	01	04	05	00	01	00	01	07	00
RT	Rubber Technology	24	16	16	00	00	00	06	03	00	00	07	14	02
WM	Water Management	12	00	00	00	00	00	00	00	00	00	00	00	00
AR	City Planning (MCP)	42	31	30	00	01	00	17	04	00	00	10	16	15
MM	Medical Science and Technology	15	08	08	00	00	00	04	01	00	00	03	07	01
IP	Intellectual Property Law	80	28	28	00	00	00	22	01	00	00	05	16	12
BM	Business Administration	160	59	58	00	00	01	38	05	00	00	16	52	07
HS	Human Resources Management	30	19	19	00	00	00	10	04	00	01	04	11	08
MT-2	Steel Technology	20	00											
EMBA	Executive MBA(Kolkata Campus)	50	33	00	00	33	00	26	05	00	00	02	31	02
EMBA	Executive MBA (Bhubaneswar Campus)	50	09	00	00	09	00	08	00	00	00	01	08	01
EC-8	Electronics and Communication Engineering (3 years M. Tech) Kol-30, Bhub-30, KGP-30, Raipur-20, Portblair-20	130	00	00	00	00	00	00	00	00	00	00	00	00
EE-8	Electrical Engineering (3 years M. Tech) Kol-30, Bhub-30, KGP-30, Raipur-20, Portblair-20	130	00	00	00	00	00	00	00	00	00	00	00	00
IT-8	Information and Communication Technology (3years M. Tech) Kol-30, Bhub-30, KGP-30, Raipur-20, Portblair-20	130	00	00	00	00	00	00	00	00	00	00	00	00
<b>Total</b>		<b>1949</b>	<b>844</b>	<b>758</b>	<b>09</b>	<b>50</b>	<b>27</b>	<b>461</b>	<b>123</b>	<b>32</b>	<b>01</b>	<b>227</b>	<b>697</b>	<b>147</b>

**TABLE B-2 - POSTGRADUATE STUDENTS ON ROLL 2013-2014**

Dept./ Centr e	Specialisation	Code	1st year		2nd year		3rd year		Total	
			M	F	M	F	M	F	M	F
AE	Aerospace Engineering	AE	09	00	20	06	-	-	15	06
AG	Farm Machinery And Power	AG1	14	02	15	01	-	-	29	03
AG	Land and Water Resources Engineering	AG2	11	04	08	06	-	-	19	10
AG	Food Process Engineering	AG3	17	12	24	06	-	-	41	18
AG	Agricultural Biotechnology	AG4	12	07	04	14	-	-	16	21
AG	Aquacultural Engineering	AG5	06	02	04	04	-	-	10	06
AG	Agricultural Systems and Management	AG6	05	05	04	03	-	-	09	08
AT	Embedded Controls and Software		06	02	08	00	-	-	14	02
BT	Biotechnology and Biochemical Engineering	BT	13	10	07	09	-	-	20	19
CE	Hydraulic and Water Resources Engineering	CE1	06	00	04	04	-	-	10	04
CE	Transportation Engineering	CE2	13	02	13	04	-	-	26	06
CE	Environmental Engineering & Management	CE3	03	02	02	03	-	-	05	05
CE	Geotechnical Engineering	CE4	10	01	12	02	-	-	22	03
CE	Structural Engineering	CE5	12	03	14	05	-	-	26	08

**TABLE B-2 - POSTGRADUATE STUDENTS ON ROLL 2013-2014**

Dept./ Centr e	Specialisation	Code	1st year		2nd year		3rd year		Total	
			M	F	M	F	M	F	M	F
CH	Chemical Engineering	CH	43	11	42	18	-	-	85	29
CL	Earth System Science and Technology	CL	11	01	08	04	-	-	19	05
CR	Cryogenic Engineering	CR	05	00	09	02	-	-	14	02
CS	Computer Science and Engineering	CS	32	05	30	08	-	-	62	13
EC	Microelectronics & VLSI Design	EC2	24	01	24	06	-	-	48	07
EC	RF and Microwave Engineering	EC3	11	02	13	05	-	-	24	07
EC	Telecommunication Systems Engineering	EC4	19	00	26	05	-	-	45	05
EC	Visual Information and Embedded Systems Engg.	EC5	19	06	15	07	-	-	34	13
EE	Machine Drives and Power Electronics	EE1	14	01	14	01	-	-	28	02
EE	Control System Engineering	EE2	09	00	15	01	-	-	24	01
EE	Power and Energy Systems	EE3	09	01	13	04	-	-	22	05
EE	Instrumentation Signal Processing	EE4	11	01	15	02	-	-	26	03
ET	Media and Sound Engineering	ET	00	00	06	01	-	-	06	01
GG	Exploration Geosciences	GG1	00	00	08	06	-	-	08	06
ID	Infrastructure Design	ID	23	01	11	01	-	-	34	02

**TABLE B-2 - POSTGRADUATE STUDENTS ON ROLL 2013-2014**

Dept./ Centre	Specialisation	Code	1st year		2nd year		3rd year		Total	
			M	F	M	F	M	F	M	F
	and Management									
IM	Industrial Engineering and Management	IM	04	01	16	00	-	-	20	01
IT	Information Technology	IT	06	03	14	04	-	-	20	07
MA	Computer Science and Data Processing	MA	22	00	17	04	-	-	39	04
ME	Manufacturing Science and Engineering	ME1	14	01	19	01	-	-	33	02
ME	Thermal Science and Engineering	ME2	27	01	28	00	-	-	55	01
ME	Mechanical Systems Design	ME3	35	01	37	02	-	-	72	03
MI	Mining Engineering	MI	13	00	13	00	-	-	26	00
MM	Medical Imaging and Informatics	MM1	00	00	05	01	-	-	05	01
MS	Materials Science and Engineering	MS	05	04	16	08	-	-	21	12
MT	Metallurgical and Materials Engineering	MT1	30	06	31	08	-		61	14
NA	Ocean Engineering and Naval Architecture	NA	12	00	18	01	-	-	30	01
PH	Solid State Technology	PH2	00	00	09	03	-	-	09	03
RE	Reliability Engineering	RE	07	00	09	01	-	-	16	01
RT	Rubber Technology	RT	14	02	11	01	-	-	25	03



**TABLE B-2 - POSTGRADUATE STUDENTS ON ROLL 2013-2014**

Dept./ Centr e	Specialisation	Code	1st year		2nd year		3rd year		Total	
			M	F	M	F	M	F	M	F
WM	Water Management	WM	00	00	08	04	-	-	08	04
AR	City Planning	MCP	16	15	12	22	-	-	28	37
MM	Medical Science And Technology	MM	07	01	12	02	-	-	19	03
BM	Business Administration	BM	52	07	52	19	-	-	104	26
HS	Human Resources Management	HS	11	08	11	05	-	-	22	13
MT	Steel Technology	MT2	00	00	00	00	-	-	00	00
BM	Executive MBA (3 Yrs.) (Kolkata Campus)	EMBA	31	02	13	02	20	02	64	06
BM	Executive MBA (3 Yrs.) (Bhubaneswar Campus)	EMBA	08	01	14	04	05	00	27	05
EC	Electronics & Communication Engineering (3 Yrs.)	EC8	00	00	10	05	14	03	24	08
EE	Electrical Engineering (3 Yrs.)	EE8	00	00	07	04	04	02	11	06
IT	Information & Communication Technology (3 Yrs.)	IT8	00	00	09	02	14	04	23	06
IP	Intellectual Property Law (3 Yrs.)	IP	16	12	32	14	25	20	73	46
	<b>Total</b>		<b>811</b>	<b>255</b>	<b>926</b>	<b>204</b>	<b>82</b>	<b>31</b>	<b>1819</b>	<b>492</b>

**TABLE- B -3 - STATEMENT OF RESULTS OF POSTGRADUATE EXAMINATION  
(M.TECH/MCP//MBA/MHRM) 2011-2012 BATCH AND MMST/LLB/M.TECH.-3 YRS/EMBA 2010-2011 BATCH OF STUDENTS**

Deptt./ Centre	Specialisation	Code	Registered	Successful	Incomplete
AE	Aerospace Engineering	AE	21	16	5
AG	Farm Machinery and Power	AG1	15	14	1
AG	Land and Water Resources Engineering	AG2	16	12	4
AG	Food Processing Engineering	AG3	25	25	4
AG	Applied Botany	AG4	17	14	3
AG	Aquacultural Engineering	AG5	07	05	2
AG	Agricultural Systems and Management	AG6	17	16	1
AT	Embedded Controls and Software	AT	07	07	0
BT	Biotechnology and Biochemical Engineering	BT	22	20	2
CH	Chemical Engineering	CH	63	44	19
CE	Hydraulic and Water Resources Engineering	CE1	13	12	1
CE	Transportation Engineering	CE2	17	15	2
CE	Environmental Engineering and Management	CE3	11	10	1
CE	Geotechnical Engineering	CE4	10	10	0
CE	Structural Engineering	CE5	21	18	3
CS	Computer Science and Engineering	CS	39	37	2
CR	Cryogenic Engineering	CR	07	07	0
CL	Earth System Science and Technology	CL	11	05	6
EE	Machine Drives and Power Electronics	EE1	15	13	2
EE	Control System Engineering	EE2	14	14	0
EE	Power and Energy System	EE3	18	13	5
EE	Instrumentation	EE4	13	08	5
EC	Microelectronics & VLSI Design	EC2	28	27	1
EC	RF and Microwave Engineering	EC3	23	19	4
EC	Telecommunication Systems Engineering	EC4	32	32	0
EC	Visual Information and Embedded Systems Engg.	EC5	21	21	0
ET	Media and Sound Engineering	ET	05	05	0
GG	Exploration Geosciences	GG1	07	07	0
IM	Industrial Engineering and Management	IM	17	16	1
IT	Information Technology	IT	29	27	2
MS	Materials Science and Engineering	MS	20	11	9
MA	Computer Science and Data Processing	MA	22	19	3
ME	Manufacturing Science and Engineering	ME1	16	14	2
ME	Thermal Science and Engineering	ME2	32	24	8
ME	Mechanical Systems Design	ME3	39	34	5
MT	Metallurgical and Materials Engineering	MT	24	21	3
MI	Mining Engineering	MI	05	02	3
NA	Ocean Engineering and Naval Architecture	NA	11	10	1
PH	Solid State Technology	PH2	18	16	2
ID	Infrastructure Design and Management	ID	23	19	4
RE	Reliability Engineering	RE	15	15	0
RT	Rubber Technology	RT	17	16	1
WM	Water Management	WM	08	08	0
AR	City Planning	MCP	34	32	2
BM	Business Administration	MBA	108	101	7
MM	Medical Science and Technology	MMST	13	04	9
HS	Human Resources Management	MHRM	19	17	2
IP	Intellectual Property Law	IP	45	27	18
EC	Electronics and Communication Engineering	EC 8	40	38	2
EE	Electrical Engineering	EE 8	30	22	8
IT	Information and Communication Technology	IT 8	20	13	7
BM	Executive MBA Programme	EMBA	30	22	8
<b>Total</b>			<b>1150</b>	<b>974</b>	<b>180</b>

**TABLE C-1**  
**NUMBER OF RESEARCH SCHOLAS ENROLLED FOR THE PH.D. DEGREE DURING: 2013-2014**

(01-07-2013 TO 30-06-2014)

Deptt./ Centre/ School	Institut e	Joint	Sponsore d Scholar	Project/CSIR / /UGC/QIP/ DBT/ICMR	Teaching/ Non- teaching	Total	Genera l	SC	ST	OBC	MINOR	Male	Female
AE	06	02	01	00	00	09	06	00	00	03	00	05	04
AG	11	03	02	07	00	23	14	02	00	06	01	13	10
AR	05	00	00	00	00	05	04	00	00	01	00	03	02
AT	10	00	00	01	00	11	05	00	00	05	01	10	01
BT	03	01	00	09	00	13	10	02	00	01	00	04	09
CY	08	09	00	12	00	29	17	06	00	06	00	21	08
CH	21	06	00	02	00	29	20	02	00	05	02	21	08
CE	13	02	01	04	00	20	13	03	01	02	01	13	07
CS	11	01	01	05	00	18	16	01	00	01	00	13	05
CR	05	00	00	00	00	05	05	00	00	00	00	03	02
ET	04	00	00	00	00	04	03	00	00	01	00	02	02
CL	03	03	00	01	00	07	04	01	00	02	00	05	02
EE	16	01	01	01	00	19	12	03	00	04	00	14	05
EC	18	01	02	02	00	23	20	01	00	02	00	20	03
GG	13	01	00	07	00	21	15	03	00	03	00	16	05
GS	07	00	00	00	00	07	06	01	00	00	00	06	01

HS	08	00	04	05	00	17	16	00	00	01	00	05	12
IM	07	00	02	03	00	12	10	01	00	01	00	11	01
ID	01	01	00	00	00	02	02	00	00	00	00	02	00
IP	07	00	00	00	00	07	05	00	00	02	00	04	03
MS	03	02	00	09	00	14	13	00	00	01	00	08	06
MA	06	13	00	06	00	25	13	06	00	06	00	15	10
ME	22	03	00	02	00	27	20	02	00	05	00	26	01
MT	10	00	04	03	00	17	10	04	01	02	00	12	05
MI	03	00	00	05	00	08	06	00	00	02	00	07	01
NA	04	00	00	01	00	05	04	00	00	01	00	03	02
PH	09	04	00	05	00	18	11	02	00	04	01	14	04
RE	03	00	00	02	00	05	04	00	00	01	00	05	00
RT	07	00	01	03	00	11	07	01	01	02	00	07	04
RJ	05	00	00	01	00	06	05	01	00	00	00	03	03
MM	03	00	01	11	00	15	13	01	01	00	00	09	06
IT	02	00	00	03	00	05	04	00	00	01	00	03	02
BM	05	00	04	06	00	15	12	00	00	02	01	11	04
WM	06	00	00	03	00	09	06	01	00	01	01	04	05
TS	01	00	00	01	00	02	02	00	00	00	00	02	00
<b>TOTAL</b>	<b>266</b>	<b>53</b>	<b>24</b>	<b>120</b>	<b>00</b>	<b>463</b>	<b>333</b>	<b>44</b>	<b>04</b>	<b>74</b>	<b>08</b>	<b>320</b>	<b>143</b>

**TABLE: C-2****NUMBER OF MS STUDENTS ENROLLED DURING: 2013-2014 (01-07-2013 TO 30-06-2014)**

<b>Deptt./Centre/ School</b>	<b>Total</b>	<b>General</b>	<b>SC</b>	<b>ST</b>	<b>OBC</b>	<b>Minor</b>	<b>Male</b>	<b>Female</b>
CE	02	02	00	00	00	00	02	00
CS	05	05	00	00	00	00	04	01
CL	01	01	00	00	00	00	00	01
EC	05	04	00	00	01	00	02	03
EE	01	01	00	00	00	00	01	00
GS	01	00	00	00	01	00	01	00
GG	01	01	00	00	00	00	00	01
IT	03	03	00	00	00	00	02	01
MT	01	01	00	00	00	00	01	00
ME	02	02	00	00	00	00	02	00
RJ	01	01	00	00	00	00	01	00
NA	01	01	00	00	00	00	01	00
MI	01	01	00	00	00	00	01	00
WM	02	01	00	00	01	00	02	00
<b>TOTAL</b>	<b>27</b>	<b>24</b>	<b>00</b>	<b>00</b>	<b>03</b>	<b>00</b>	<b>20</b>	<b>07</b>

**TABLE: C-2a**

**NUMBER OF POST DOCTORAL FELLOWS AS ON 02-06-2014**

<b>Dept/Centre/ School</b>	<b>Total Number</b>	<b>General</b>	<b>SC</b>	<b>ST</b>	<b>OBC</b>	<b>MINOR</b>	<b>Male</b>	<b>Female</b>
CS	01	01(FN)	00	00	00	00	01	00
CY	03	03	00	00	00	00	02	01
NA	01	00	00	00	01	00	01	00
<b>TOTAL</b>	<b>05</b>	<b>04</b>	<b>00</b>	<b>00</b>	<b>01</b>	<b>00</b>	<b>04</b>	<b>01</b>

(FN) from Ethiopia

TABLE: C-3

## UGC SCHOLARS ENROLLED DURING: 2013-2014 (01-07-2013 TO 30-06-2014)

Dept/Centre/ School	Total Number	General	SC	ST	OBC	MINOR	Male	Female
AG	01	00	00	00	01	00	01	00
BT	01	00	01	00	00	00	01	00
CY	08	06	01	00	01	00	07	01
CL	01	01	00	00	00	00	01	00
GG	02	01	01	00	00	00	01	01
HS	04	03	00	00	01	00	03	01
IM	01	00	00	00	01	00	01	00
MS	02	02	00	00	00	00	02	00
MA	01	01	00	00	00	00	01	00
PH	03	02	00	00	00	01	03	00
BM	06	04	00	00	01	01	05	01
<b>TOTAL</b>	<b>30</b>	<b>20</b>	<b>03</b>	<b>00</b>	<b>05</b>	<b>02</b>	<b>26</b>	<b>04</b>

**TABLE: C-4**  
**RESEARCH SCHOLAS ON ROLL AS ON 31-05-2014**

Deptt./ Centre/ School	Institut e	Joint	Sponsor ed Scholar	Project/CSI R/ /UGC/QIP/ DBT/ICMR	Teaching/ Non- teaching	Self- Fin.	Total	Gener al	SC	ST	OBC	MINOR	Male	Femal e
AE	22	02	08	004	00	00	036	024	04	00	08	00	027	09
AG	47	07	12	072	01	00	139	101	07	04	25	02	086	53
AR	24	01	02	007	00	00	034	023	04	00	02	05	015	19
AT	39	00	04	044	00	00	087	066	05	01	13	02	065	22
BT	16	02	00	057	00	00	075	061	08	00	06	00	042	33
CY	21	17	00	161	00	00	199	151	17	00	22	09	146	53
CH	50	07	03	013	01	00	074	051	08	00	12	03	056	18
CE	54	04	08	024	00	00	090	064	12	03	10	01	070	20
CS	29	01	05	022	01	00	058	051	03	00	04	00	044	14
CR	13	00	00	001	00	00	014	012	01	00	01	00	010	04
ET	12	00	00	001	00	00	013	011	01	00	01	00	007	06
CL	07	03	03	012	00	00	025	017	03	00	04	01	020	05
EE	58	04	02	006	00	00	070	052	04	01	11	02	058	12
EC	83	01	10	017	01	00	112	093	06	01	10	02	098	14
GG	29	04	01	031	00	01	066	043	11	01	09	02	047	19



GS	18	00	06	005	00	00	029	023	05	00	01	00	024	05
HS	35	00	15	017	00	04	071	059	06	00	05	01	033	38
IM	22	00	10	006	01	00	039	031	02	01	04	01	036	03
ID	04	01	00	000	00	00	005	005	00	00	00	00	004	01
IP	08	00	00	003	02	00	013	010	00	00	03	00	008	05
MS	17	03	02	037	01	00	060	042	05	00	09	04	047	13
MA	29	30	00	017	00	01	077	048	12	00	14	03	056	21
ME	79	05	08	021	00	01	114	089	12	00	12	01	109	05
MT	32	00	21	013	00	00	066	045	11	02	07	01	053	13
MI	19	00	02	011	00	00	032	024	04	00	04	00	025	07
NA	10	00	01	004	00	00	015	010	02	00	02	01	012	03
PH	38	16	01	028	00	01	084	063	06	00	12	03	065	19
RE	08	00	02	005	00	00	015	011	01	00	01	02	012	03
RT	17	00	08	019	00	00	044	033	04	01	06	00	037	07
RJ	09	00	00	006	00	00	015	013	01	00	00	01	009	06
MM	19	00	12	033	00	01	065	053	06	02	04	00	040	25
IT	07	01	01	028	00	00	037	032	01	00	02	02	029	08
BM	18	00	15	013	00	01	047	037	02	00	06	02	034	13
WM	16	00	00	003	00	00	019	013	02	00	02	02	012	07
TS	03	00	00	002	00	00	005	003	00	00	01	01	005	00
<b>TOTAL</b>	<b>912</b>	<b>109</b>	<b>162</b>	<b>743</b>	<b>08</b>	<b>10</b>	<b>1944</b>	<b>1464</b>	<b>176</b>	<b>17</b>	<b>233</b>	<b>54</b>	<b>1441</b>	<b>503</b>

**INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR**  
**RECEIPTS AND PAYMENTS FOR THE YEAR ENDED**  
**31ST MARCH'2014**

(Amount-Rs)					(Amount-Rs)				
Sl.No	RECEIPTS	Schedule	Current Year	Previous Year	Sl.No	PAYMENTS	Schedule	Current Year	Previous Year
			(2013-2014)	(2012-2013)				(2013-2014)	(2012-2013)
I.	<b>Opening Balance ( Bank Balances)</b>								
	a) In Current Accounts	A	176074466	194759252	I.	<b>EXPENSES:</b>			
	b) In Savings Accounts	A	266284102	711995687		a) Establishment Expenses	H	2038162772	1921979609
II.	<b>Grants Received</b>					b) Administrative Expenses.	I	779518264	501447142
	Non-Recurring (Plan)	B	2805000000	1590000000	II.	<b>Expenditure on Fixed Assets &amp; Capital Work-in-Progress (Plan)</b>	J	3772186798	2520760636
	Recurring (Non-Plan)	B	2482923000	1736012000					
	Multi Speciality Hospital (Plan)	B	0	750000000	III.	<b>Investments and deposits made :</b>			
	Diamond Jubilee Special Grant (Plan)	B	0	700000000		Out of Own Funds & Others	K	8627223699	10152024009
III.	<b>Income from Investment</b>				IV.	<b>Other Payments</b>	L	923919724	1510477157
	c) Own Funds	C	158522649	176533032	V.	<b>Closing Balance</b>			
IV.	<b>Interest Received</b>					a) In Current Accounts	M	183974695	176074466
	a) On Bank Deposits	D	14053057	7134522		b) In Savings Accounts	M	290668089	266284102
	b) Recoverable Advances	D	9659366	10455387					
V.	<b>Academic &amp; General Receipts</b>	E	477963035	438856220					
VI.	<b>Amount Borrowed/Loan refund received</b>	F	12000000	12600000					
VII.	<b>Other Receipts(Refund/Reimbursement)</b>	G	10213174366	10720701021					
	<b>TOTAL :</b>		<b>16615654041</b>	<b>17049047121</b>		<b>TOTAL :</b>		<b>16615654041</b>	<b>17049047121</b>