## CONTENTS

<table>
<thead>
<tr>
<th>Subject</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization</td>
<td></td>
</tr>
<tr>
<td>Administration</td>
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<tr>
<td>Report of the Director</td>
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</table>

**PART–I**

Departments, Centres and Schools :  
Courses Offered :  

### DEPARTMENTS

- Aerospace Engineering :  
- Agricultural and Food Engineering :  
- Architecture and Regional Planning :  
- Biotechnology :  
- Chemical Engineering :  
- Chemistry :  
- Civil Engineering :  
- Computer Science and Engineering :  
- Electrical Engineering :  
- Electronics and Electrical Communication Engineering :  
- Geology and Geophysics :  
- Humanities and Social Sciences :  
- Industrial Engineering and Management :  
- Mathematics :  
- Mechanical Engineering :  
- Metallurgical and Materials Engineering :  
- Mining Engineering :  
- Ocean Engineering and Naval Architecture :  
- Physics and Meteorology :  

### CENTRES

- Centre for Educational Technology :  
- Centre for Oceans, Rivers, Atmosphere and Land Sciences :  
- Cryogenic Engineering :  
- Materials Science :  
- Reliability Engineering :  
- Rubber Technology :  
- Rural Development :  

### SCHOOLS

- G. S. Sanyal School of Telecommunications :  

PART-II CENTRALISED SERVICES, PROGRAMMES AND UNITS

Alumni Affairs & International Relations
Advanced Technology Development Centre
Computer and Informatics Centre
Continuing Education Centre
Central Research Facility
Central Library
Central Workshop & Instruments Service Section
Centre for Theoretical Studies
Information Cell
Institute Civil Works
Institute Electrical Works
Institute Water Works
Kalpana Chawla Space Technology Cell
National Cadet Corps (NCC)
National Service Scheme (NSS)
Rajbhasha Vibhag
Sponsored Research and Industrial Consultancy
Science & Technology Entrepreneurs’ Park
Training and Placement Section
Technology Telecom Centre
Technology Students Gymkhana

PART-III STATISTICAL INFORMATION

Statistical Information of Students
Financial Information

RESEARCH PUBLICATIONS

PART-I

DEPARTMENTS

Aerospace Engineering
Agricultural and Food Engineering
Architecture and Regional Planning
Biotechnology
Chemical Engineering
Chemistry
Civil Engineering
Computer Science and Engineering
Electrical Engineering
Electronics and Electrical Communication Engineering
Geology and Geophysics
Humanities and Social Sciences
Industrial Engineering and Management
Mathematics
Mechanical Engineering
Metallurgical and Materials Engineering
Mining Engineering
Ocean Engineering and Naval Architecture
Physics and Meteorology

CENTRES

Centre for Educational Technology
Centre for Oceans, Rivers, Atmosphere and Land Sciences
Cryogenic Engineering
Materials Science
Reliability Engineering
Rubber Technology
Rural Development

SCHOOLS

Rajiv Gandhi School of Intellectual Property Law
School of Information Technology
School of Medical Science & Technology
Vinod Gupta School of Management

PART–II CENTRALISED SERVICES, PROGRAMMES AND UNITS

Advanced Technology Development Centre
Computer & Informatics Centre
Central Research Facility
Central Library
Central Workshop and Instruments Service Section
Centre for Theoretical Studies
Kalpana Chawla Space Technology Cell
LIST OF THE MEMBERS OF IIT COUNCIL
(April 2009 – March 2010)

Name of the Representing Organization

(A)  The Minister-in-Charge of Technical Education in the Central Government (Ex-officio)

1.  Shri Kapil Sibal
    Hon’ble Minister of Human Resource Development
    Government of India
    Chairman

(B)  Chairman of each institute (Ex-officio)

2.  Shri B. Muthuraman
    Chairman, BOG, IIT Kharagpur
    Member

3.  Dr. Anil Kakodkar,
    Chairman, BoG, IIT Bombay
    Member

4.  Shri R. P. Agrawal
    Chairman, BOG, IIT Delhi
    Member

5.  Dr. R. Chidambaram
    Chairman, BOG, IIT Madras
    Member

6.  Prof. M. Anandakrishnan
    Chairman, BOG, IIT Kanpur
    Member

7.  Dr. R. P. Singh
    Chairman, BOG, IIT Guwahati
    Member

8.  Shri Ashok Bhatnagar
    Chairman, BOG, IIT Roorkee
    Member

(C)  Director of each Institute (Ex-officio)

9.  Prof. Damodar Acharya
    Director, IIT Kharagpur
    Member

10. Prof. Surendra Prasad
    Director, IIT Delhi
    Member

11. Prof. Devang Khakhar
    Director, IIT Bombay
    Member

12. Prof. M. S. Ananth
    Director, IIT Madras
    Member

13. Prof. S. G. Dhande
    Director, IIT Kanpur
    Member
14. Prof. Gautam Baura  
   Director, IIT Guwahati  
   Member

15. Prof. S. C. Saxena  
   Director, IIT Roorkee  
   Member

(D) Chairman, University Grants Commission (Ex-officio)

16. Prof. Sukhdeo Throat  
   Chairman, University Grants Commission  
   New Delhi  
   Member

(E) Director-General, Council of Scientific & Industrial Research (Ex-officio)

17. Prof. Samir K. Brahmachari  
   Director General, Council of Scientific & Industrial Research  
   New Delhi  
   Member

(F) Chairman, Council of the Indian Institute of Science, Bangalore (Ex-officio)

18. Dr. K. Kasturirangan  
   Chairman, Indian Institute of Science  
   Bangalore  
   Member

(G) Director, Indian Institute of Science, Bangalore (Ex-officio)

19. Prof. P. Balaram  
   Director, Indian Institute of Science  
   Bangalore  
   Member

(H) Three Nominees of the Central Government

20. Smt. Vibha Puri Das  
    Secretary, Department of Higher Education  
    Ministry of Human Resource Development  
    Government of India  
    (To represent Ministry concerned with Technical Education)  
    Member

21. Ms. Sushma Nath  
    Secretary, Department of Expenditure  
    Ministry of Finance  
    Government of India  
    (To represent Ministry of Finance)  
    Member

22. Dr. R. Chandrasekhar  
    Secretary, Department of Information Technology  
    Ministry of Communication and Information Technology  
    Government of India  
    (To represent any other Ministry)  
    Member
(I) Nominee of the All India Council for Technical Education (AICTE)

23. Dr. S. S. Mantha Member
   Chairman, AICTE
   New Delhi

(J) Nominees of the Visitor

24. Prof. C. N. R. Rao Member
    Chairman, Scientific Advisory Council to the Prime Minister

25. Prof. C. S. Seshadri Member
    Director
    Chennai Mathematical Institute, Chennai

26. Prof. Sabyasachi Bhattacharya Member
    Ex-Director
    Tata Institute of Fundamental Research, Mumbai

27. Dr. Kota Harinarayan Member
    Chairman
    Research Council of Central Scientific Instrument Organization
    Bangalore

28. Shri Tarun Das Member
    Chief Mentor
    Confederation of Indian Industry, Gurgaon

(K) Three members of Parliament (two from Lok Sabha and one from Rajya Sabha)

29. Shri Deepender Singh Hooda Member
    Member of Parliament (Lok Sabha)

30. Shri Janardhana Swamy Member
    Member of Parliament (Lok Sabha)

31. Smt. Vasanthi Stanley Member
    Member of Parliament (Rajya Sabha)

(L) Secretary to the Council

32. Shri Ashok Thakur Secretary
    Additional Secretary (HE)
    Department of Higher Education
    Ministry of Human Resource Development
    Government of India
BOARD OF GOVERNORS

# Name and Address                        Position

1. Shri B. Muthuraman
   Chairman, BOG, IIT Kharagpur &
   Vice Chairman, Tata Steel Limited
   Bombay House
   24, Homi Mody Street, Fort
   Mumbai – 400 001
   Chairman

2. Shri R.P. Agrawal (Upto 04.08.2009)
   Education Secretary, Government of India
   Ministry of Human Resource Development
   Department of Higher Education
   Shastri Bhawan
   New Delhi – 110 115
   Member

3. Ms. Vibha Puri Das (from 05.08.2009)
   Secretary(HE), Government of India
   Ministry of Human Resource Development
   Department of Higher Education
   Shastri Bhawan
   New Delhi – 110 115
   Member

4. Prof. T. P. Singh
   Head of the Department (Bio-Physics)
   All India Institute of Medical Sciences (AIIMS)
   Ansari Nagar
   New Delhi – 110 029
   Member

5. Dr. T. Ramasami
   Secretary, Department of Science and Technology
   Technology Bhawan, New Mehrauli Road
   New Delhi – 110 016
   Member

6. Prof. Prem Kumar Kalra
   Director, IIT Rajasthan
   III Floor, Helicopter Building
   IIT Kanpur Campus
   Kanpur – 208 016
   Member

7. Shri Roopen Roy
   Managing Director
   Deloitte & Touche Consulting India Pvt. Ltd.
   Bengal Intelligent Park, Building Alpha
   1st Floor, Plot No. A2, M2 & N2, Block–EP & GP
   Sector-V, Salt lake Electronics Complex
   Kolkata – 700 091
   Member

8. Dr. Dhruv Prasad (upto 03.01.2010)
   Director, Department of Science & Technology
   Government of Bihar
   Patna – 800 015
   Member

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<table>
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<tr>
<th>#</th>
<th>Name and Address</th>
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<tbody>
<tr>
<td>9.</td>
<td>Prof. O. N. Mohanty (upto 03.01.2010) Vice Chancellor, Biju Patnaik University of Technology Rourkela Camp Techno Campus C.E.T. Ghatikia, Kalinganagar Bhubaneswar – 751 003</td>
<td>Member</td>
</tr>
<tr>
<td>10.</td>
<td>Shri R. S. Sharma (upto 03.01.2010) Principal Secretary, Department of Science &amp; Technology Government of Jharkhand Nepal House, Doranda Ranchi – 834 002</td>
<td>Member</td>
</tr>
<tr>
<td>11.</td>
<td>Prof. D. Acharya Director, IIT Kharagpur</td>
<td>Member</td>
</tr>
<tr>
<td>13.</td>
<td>Prof. R. N. Datta (from 01.01.2010) Department of Architecture &amp; Regional Planning IIT Kharagpur</td>
<td>Member</td>
</tr>
<tr>
<td>15.</td>
<td>Prof. P. K. J. Mohapatra (from 01.01.2010) Department of Industrial Engineering &amp; Management IIT Kharagpur</td>
<td>Member</td>
</tr>
<tr>
<td>16.</td>
<td>Dr. D. Gunasekaran (up to 04.12.2009) Registrar IIT Kharagpur</td>
<td>Secretary</td>
</tr>
<tr>
<td>17.</td>
<td>Dr. T. K. Ghosal (from 05.12.2009) Registrar (Officiating) IIT Kharagpur</td>
<td>Secretary</td>
</tr>
</tbody>
</table>
# Name and Address                      | Position
---|---
1. Shri B. Muthuraman               | Chairman  
Chairman, BOG, IIT Kharagpur &  
Vice Chairman, Tata Steel Limited  
Bombay House,  
24, Homi Mody Street, Fort  
Mumbai – 400 001
2. Shri Sanat Kumar Ray            | Member  
Financial Adviser & Joint Secretary  
Government of India  
Ministry of Human Resource Development  
Department of Higher Education  
Shastri Bhawan  
New Delhi – 110 001
3. Joint Secretary (T)             | Member  
Government of India  
Ministry of Human Resource Development  
Department of Higher Education  
Shastri Bhawan  
New Delhi – 110 001
4. Shri Roopen Roy                 | Member  
Managing Director  
Deloitte & Touche Consulting India Pvt. Ltd.  
Bengal Intelligent Park, Building Alpha,  
1st Floor Plot No.A2, M2 & N2, Block–EP & GP,  
Sector-V, Salt lake Electronics Complex  
Kolkata – 700 091
5. Director                        | Member  
Indian Institute of Technology Kharagpur  
Kharagpur – 721 302
6. Prof. P. P. Chakrabarti        | Member  
Department of Computer Science & Engineering  
Indian Institute of Technology Kharagpur  
Kharagpur – 721 302
7. Registrar                      | Secretary  
Indian Institute of Technology Kharagpur  
Kharagpur – 721 302
# BUILDING AND WORKS COMMITTEE

<table>
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<tr>
<td>1.</td>
<td>Director</td>
<td>Chairman</td>
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<tr>
<td></td>
<td>Indian Institute of Technology Kharagpur</td>
<td></td>
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<td></td>
<td>Kharagpur – 721 302</td>
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<tr>
<td>2.</td>
<td>Director (T)</td>
<td>Member</td>
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<td></td>
<td>Government of India</td>
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<td>Ministry of Human Resource Development</td>
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<td>3.</td>
<td>Shri D. K. Mitra</td>
<td>Member</td>
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<tr>
<td></td>
<td>Superintending Engineer &amp; Circle Manager</td>
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<td>Midnapore Distribution Circle</td>
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<td>190, S. K. Bose Road</td>
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<td>Midnapore – 721 101</td>
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<tr>
<td></td>
<td>Dist. : Paschim Medinipur</td>
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<td>4.</td>
<td>Superintending Engineer</td>
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<td>Department of Civil Engineering</td>
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<td>8.</td>
<td>Registrar</td>
<td>Secretary</td>
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<td>Position</td>
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</tr>
<tr>
<td>Director</td>
<td>Prof. Damodar Acharya</td>
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<tr>
<td>Deputy Director</td>
<td>Prof. M. Chakraborty</td>
<td>Upto 19.05.2009</td>
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<tr>
<td></td>
<td>Prof. A.K. Majumdar</td>
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<tr>
<td>Registrar</td>
<td>Dr. D. Gunasekaran (on lien)</td>
<td>From 05.12.2009</td>
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<tr>
<td></td>
<td>Dr. T.K. Ghosal (Officiating)</td>
<td>From 05.12.2009</td>
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<tr>
<td>Deans</td>
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<tr>
<td>Undergraduate Studies</td>
<td>Prof. S. K. Som</td>
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<tr>
<td>Postgraduate Studies &amp; Research</td>
<td>Prof. P. K. J. Mohapatra</td>
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<tr>
<td>Faculty &amp; Planning</td>
<td>Prof. R. N. Datta</td>
<td>Upto 31.08.2009</td>
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<tr>
<td>Faculty</td>
<td>Prof. Amit Basak</td>
<td>From 01.09.2009</td>
</tr>
<tr>
<td>Planning &amp; Coordination</td>
<td>Prof. B. K. Mathur</td>
<td>From 09.09.2009</td>
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<tr>
<td>Sponsored Research &amp; Industrial Consultancy</td>
<td>Prof. P. P. Chakrabarti</td>
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<tr>
<td>Students’ Affair</td>
<td>Prof. Souvik Bhattacharyya</td>
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<tr>
<td>Continuing Education</td>
<td>Prof. Ajay Chakraborty</td>
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<tr>
<td>Alumni Affairs &amp; International Relations</td>
<td>Prof. Amit Patra</td>
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<tr>
<td>Vinod Gupta School of Management</td>
<td>Prof. S. Srinivasan</td>
<td>Upto 04.06.2009</td>
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<tr>
<td></td>
<td>Prof. A. Tripathy</td>
<td>From 05.06.2009</td>
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<tr>
<td>Head of Departments</td>
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<tr>
<td>Aerospace Engineering</td>
<td>Prof. Navtej Singh</td>
<td>Upto 13.01.2010</td>
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<td>Prof. Amit K. Ghosh</td>
<td>From 14.01.2010</td>
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<tr>
<td>Agricultural &amp; Food Engineering</td>
<td>Prof. Rajendra Singh</td>
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<td>Architecture &amp; Regional Planning</td>
<td>Prof. Arif N. Merchant</td>
<td>Upto 31.05.2009</td>
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<td>Prof. B.K. Sengupta</td>
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<tr>
<td>Biotechnology</td>
<td>Prof. A. K. Ghosh</td>
<td>Upto 31.08.2009</td>
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<td>Prof. Amit K. Das</td>
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<tr>
<td>Chemical Engineering</td>
<td>Prof. Amar Nath Samanta</td>
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<td>Prof. P. K. Chattaraj</td>
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<td>Civil Engineering</td>
<td>Prof. S. K. Bhattacharya</td>
<td>Upto 02.08.2009</td>
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<td>Prof. L.S. Ramachandra</td>
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<tr>
<td>Computer Science &amp; Engineering</td>
<td>Prof. Indranil Sengupta</td>
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<tr>
<td>Electronics &amp; Electrical</td>
<td>Prof. Ajay Chakraborty</td>
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<td>Prof. C.K. Maiti</td>
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<tr>
<td>Humanities &amp; Social Sciences</td>
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<td>Prof. B. Mohanty</td>
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<td></td>
<td>Prof. A. R. Roy</td>
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<td>Prof. A. K. Chattopadhyay</td>
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<td>Metallurgical &amp; Materials</td>
<td>Prof. N. Chakraborti</td>
<td>Upto 01.09.2009</td>
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<td>Prof. S.K. Roy</td>
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<td>Mining Engineering</td>
<td>Prof. J. Bhattacharyya</td>
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<td>Ocean Engineering &amp; Naval Architecture</td>
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<td>Physics &amp; Meteorology</td>
<td>Prof. R. N. P. Choudhary</td>
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**Head of Centres**

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<th>Centre</th>
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<td>Centre for Educational Technology</td>
<td>Prof. T. K. Basu</td>
<td>Upto 05.07.2009</td>
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<td>Dr. Bani Bhattacharyya</td>
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<td>Centre for Oceans, Rivers, Atmosphere and Land Sciences</td>
<td>Prof. A. Chandrasekar</td>
<td>Upto 28.06.2009</td>
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<td>Prof. D. Sen</td>
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<td>Cryogenic Engineering</td>
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<td>Prof. V. N. Achutha Naikan</td>
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<td>Prof. T. K. Chaki</td>
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<tr>
<td>Computer &amp; Informatics</td>
<td>Prof. Prabir Kumar Biswas</td>
<td></td>
</tr>
<tr>
<td>Administrative Computer Service Support Centre</td>
<td>Prof. Rajib Mall</td>
<td>Upto 31.08.2009</td>
</tr>
<tr>
<td></td>
<td>Prof. R. N. Banerjee</td>
<td>From 01.09.2009</td>
</tr>
</tbody>
</table>
Head of Schools

G. S. Sanyal School of Telecommunications  Prof. S. Chakrabarti
School of Information Technology  Prof. I. Sengupta
School of Medical Science & Technology  Prof. Pranab Kumar Dutta
Vinod Gupta School of Management  Prof. S. Srinivasan  Upto 04.06.2009
Rajiv Gandhi School of Intellectual Property Law  Prof. S. Tripathy  Upto 11.08.2009
Ranbir and Chitra Gupta School of Infrastructure Design and Management  Prof. K. S. Reddy
School of Water Resources  Prof. S. N. Panda

Chairmen & Vice-Chairmen

UG Admissions  Prof. A. N. Samanta
Vice-Chairman, UG Admissions  Prof. P. K. Dutta  Upto 19.08.2009
Prof. D. K. Baidya  From 20.08.2009
Prof. Biswajit Maiti

PG Admissions  Prof. S. K. Barai
Vice-Chairman, PG Admissions  Prof. Somesh Kumar  Upto 15.08.2009
Prof. Krishna Kumar  From 16.08.2009
Prof. A. Chandrasekar  Upto 15.08.2009
Prof. Saibal Gupta  From 16.08.2009
Prof. S. Sahu

JAM  Prof. P. D. Srivastava  Upto 28.04.2009
Prof. A. Goswami  From 29.04.2009

Hall Management Committee  Prof. P. K. Das

Central Library  Prof. P. K. Das

Chairman, CWISS  Prof. P. K. Das

Central Research Facility  Prof. Indranil Manna  Upto 30.11.2009
CRF (Materials Division)  Prof. Rahul Mitra  From 01.12.2009
CRF (Life Science Division)  Prof. A. K. Ghosh  From 01.12.2009
IIT-Optel Fibre Optics R&D Centre  Prof. Indranil Manna  Upto 30.11.2009
Prof. P. D. Srivastava

Nehru Museum of Science & Technology  Prof. D. Sen
Kalpana Chawla Space Technology Cell (KCSTC)  
Prof. Somnath Sengupta

Advanced Technology Development Centre (ATDC)  
Prof. P. P. Chakrabarti

Professors-in-Charge

Examinations  
Prof. P. D. Srivastava

Training & Placement  
Prof. B. K. Mathur  
Prof. S.K. Srivastava  
Upto 09.09.2009  
From 10.09.2009

General Time Table  
Prof. B. Mahanty  
Prof. D. K. Pratihar  
Upto 09.09.2009  
From 10.09.2009

Convocation-2009  
Prof. P.K.J. Mohapatra

Institute Information Cell  
Prof. B. K. Mathur

President, Technology Students Gymkhana  
Prof. Manish Bhattacharjee

Refrigeration & Air Conditioning  
Prof. Sukanta Dash

Horticulture  
Prof. S. C. Kundu  
Prof. C. K. Mukherjee  
Upto 07.09.2009  
From 08.09.2009

Water Works  
Prof. A. K. Gupta

Civil Works (Construction and Maintenance)  
Prof. S. K. Bhattacharya  
Prof. N. Dhang  
Upto 02.08.2009  
From 03.08.2009

Electrical Works  
Prof. D. Das

Telecommunication  
Prof. R. V. Raja Kumar  
Prof. S. S. Pathak  
Upto 15.02.2010  
From 16.02.2010

Institute Guest Houses  
Prof. B. K. Sengupta

Intellectual Property Right & Industrial Relation  
Prof. S. Tripathy

General

Librarian  
Dr. B. Sutradhar

Public Information Officer  
Dr. Tapan Kumar Ghosal  
Dr. Anathbandhu Patra  
Upto 06.01.2010  
From 07.01.2010

Head, B.C. Roy Technology Hospital  
Dr. Nirmal Kumar Som  
Dr. Seema Ray  
Upto 21.02.2010  
From 22.02.2010

Superintending Engineer (Civil)  
Shri T. K. Mukherjee

Executive Engineer (Civil)  
Shri Subrat Roy  
Shri Arun Rudra
Shri Avik Patra
Executive Engineer
(Electrical)
Shri Sabyasachi Ghosh
Shri Mahesh Kumar
Shri D.K. Chakraborty
Security Officer
Shri U. P. Singh

Deputy Registrars

Establishment Section  Shri Atul Prakash Trivedi

Academic Section  Shri Nalini Ranjan Maiti  Upto  30.09.2009

Finance & Accounts  Dr. Tapan Kumar Ghosal

Estate Office  Shri B. K. Basu Roychowdhury

Stores & Purchase  Shri Sandeep Chatterjee  From  06.04.2009
THE SENATE

Director (Chairman) Prof. Damodar Acharya
Deputy Director Prof. A. K. Majumdar

Department of Aerospace Engineering
Prof. A. K. Ghosh
Prof. P. K. Datta
Prof. G. Bandyopadhyay
Prof. N. Singh

Department of Agricultural & Food Engineering
Prof. K. P. Pandey
Prof. B. C. Mal (Lien Upto 10.02.2015)
Prof. R. Singh
Prof. V. K. Tewari
Prof. K. N. Tiwari
Prof. R. K. Panda
Prof. R. Banerjee
Prof. S. K. Das
Prof. P. B. S. Bhadoria
Prof. B. C. Ghosh
Prof. A. K. Datta
Prof. H. N. Mishra
Prof. N. S. Raghuvanshi
Prof. S. N. Panda
Prof. T. K. Goswami
Prof. H. Das
Prof. S. Prasad
Prof. N. Mallick
Prof. M. K. Jha
Prof. H. Raheman
Prof. S. Dutta Gupta

Department of Architecture & Regional Planning
Prof. R. N. Datta
Prof. B. K. Sengupta
Prof. U. K. Banerjee
Prof. A. N. Merchant (EOL Upto 31.05.2011)
Prof. J. Barman
Prof. S. Chattopadhyay

Department of Biotechnology

Prof. S. C. Kundu
Prof. D. Das
Prof. S. H. Dey
Prof. A. K. Ghosh
Prof. A. K. Das
Prof. T. K. Maiti

Centre for Educational Technology

Prof. A. K. Ray
Prof. B. Bhattacharya

Department of Chemical Engineering

Prof. D. Mukherjee
Prof. A. N. Samanta
Prof. S. Dasgupta
Prof. N. C. Pradhan
Prof. S. De
Prof. G. Das
Prof. R. K. Saha

Department of Chemistry

Prof. P. Pramanik
Prof. T. K. Sarkar
Prof. J. K. Roy
Prof. P. K. Chattaraj
Prof. S. Roy (Lien Upto 28.06.2011)
Prof. T. Pathak
Prof. T. Pal
Prof. A. Basak
Prof. D. Mal
Prof. D. Ray
Prof. M. Bhattacharjee
Prof. S. K. Srivastava
Prof. N. Sarkar

Department of Civil Engineering
Prof. J. N. Bandyopadhyay
Prof. D. P. Ghosh
Prof. S. P. Dasgupta
Prof. S. K. Bhattacharyya (Lien Upto 02.08.2014)
Prof. K. S. Reddy
Prof. L. S. Ramachandra
Prof. S. Dey
Prof. D. K. Baidya
Prof. N. Dhang
Prof. B. B. Pandey
Prof. S. Majumdar
Prof. D. Sen
Prof. S. K. Barai
Prof. V. R. Desai

Department of Computer Science & Engineering

Prof. A. Pal
Prof. S. Ghose
Prof. P. P. Chakraborti
Prof. A. Basu
Prof. I. Sengupta
Prof. J. Mukhopadhyay
Prof. S. P. Pal
Prof. R. Mall
Prof. D. Sarkar
Prof. D. Roy Chowdhury
Prof. Pallab Dasgupta
Prof. Rajeev Kumar
Prof. Sudeshna Sarkar

Cryogenic Engineering Centre

Prof. S. K. Sarangi (Lien Upto 02.11.2010)
Prof. S. S. Bandyopadhyay
Prof. T. K. Dey
Prof. V. Rao Vutukuru
Prof. K. Chowdhury

Department of Electrical Engineering
Prof. S. K. Das  
Prof. A. K. Sinha  
Prof. J. Pal  
Prof. S. Banerjee (Lien Upto 30.04.2011)  
Prof. A. Patra  
Prof. N. K. Kishore  
Prof. A. Barua  
Prof. Goshaidas Ray  
Prof. S. Mukhopadhyay  
Prof. S. Sen  
Prof. P. K. Dutta  
Prof. B. M. Mohan  
Prof. Debapriya Das  
Prof. Sabyasachi Sengupta (Lien Upto 09.06.2012)  
Prof. T. K. Bhattacharya

**Department of Electronics & Electrical Communication Engineering**

Prof. R. Garg  
Prof. A. Chakraborty  
Prof. D. Dutta  
Prof. A. K. Roy (Lien Upto 28.02.2013)  
Prof. S. Banerjee  
Prof. C. K. Maiti  
Prof. V. R. K. Ratnam (Lien Upto 04.02.2015)  
Prof. P. K. Biswas  
Prof. S. Sengupta  
Prof. M. Chakraborty  
Prof. S. S. Pathak  
Prof. S. Sanyal  
Prof. D. Biswas  
Prof. B. K. Sarkar  
Prof. K. K. Bandyopadhyay

**Department of Geology & Geophysics**

Prof. S. K. Nath  
Prof. B. Mishra  
Prof. A. K. Gupta  
Prof. D. Sengupta  
Prof. A. Bhattacharya  
Prof. S. Tripathy  
Prof. Anindya Sarkar  
Prof. Subhasish Das  
Prof. M. K. Panigrahi  
Prof. S. K. Bhowmik  
Prof. S. Gupta  
Prof. A. K. Bhattacharya

**G. S. Sanyal School of Telecommunications**
Prof. S. Chakraborti

**Department of Humanities & Social Sciences**

Prof. (Ms.) B. Chatterjee  
Prof. P. Basu  
Prof. H. R. Tewari  
Prof. D. Suar  
Prof. A. Gera Roy  
Prof. K. B. L Srivastava  
Prof. S. Chopra Chatterjee  
Prof. V. N. Giri

**Department of Industrial Engineering & Management**

Prof. P. K. J. Mohapatra  
Prof. R. N. Banerjee  
Prof. S. Sahu  
Prof. B. Mahanty  
Prof. P. K. Roy  
Prof. J. Mukherjee  
Prof. M. K. Tiwari

**Materials Science Centre**

Prof. D. Bhattacharya  
Prof. C. K. Das  
Prof. B. Adhikari  
Prof. S. Ram

**Department of Mathematics**

Prof. A. R. Roy  
Prof. P. D. Srivastava  
Prof. A. Sarkar  
Prof. U. C. Gupta  
Prof. M. P. Biswal  
Prof. D. K. Gupta  
Prof. V. K. Jain  
Prof. S. Bhattacharyya  
Prof. A. Goswami  
Prof. Somesh Kumar

**Department of Mechanical Engineering**
Prof. B. Maiti
Prof. A. Mukherjee
Prof. A. Chatterjee
Prof. R. Karmakar
Prof. S. K. Som
Prof. V. V. Satyamurty
Prof. S. K. Roy Chowdhury
Prof. A. K. Chattopadhyay
Prof. S. Bhattacharya
Prof. R. Bhattacharyya
Prof. S. K. Dash
Prof. P. K. Das
Prof. A. R. Mohanty
Prof. S. N. Bhattacharyya
Prof. R. N. Maiti
Prof. S. Paul
Prof. M. C. Ray
Prof. A. K. Nath
Prof. S. Roy
Prof. D. K. Pratihar
Prof. S. Chakraborty
Prof. A. Dasgupta
Prof. A. Guha

Department of Metallurgical & Materials Engineering

Prof. M. Chakraborty (Lien Upto 19.05.2014)
Prof. R. N. Ghosh
Prof. S. K. Pabi
Prof. S. K. Roy
Prof. M. M. Godkhindi
Prof. K. K. Ray
Prof. N. Chakraborty
Prof. I. Manna (Lien Upto 28.02.2015)
Prof. Siddhartha Das
Prof. K. Das
Prof. G. G. Roy
Prof. R. Mitra
Prof. P. K. Sen

Department of Mining Engineering

Prof. S. S. Bhamidipati
Prof. A. Bhattacharya
Prof. K. U. M. Rao
Prof. S. K. Das
Prof. K. Pathak
Prof. J. Bhattacharyya
Prof. S. K. Mukhopadhyay
Department of Ocean Engineering & Naval Architecture

Prof. S. C. Misra (Lien Upto 30.09.2013)
Prof. S. K. Satsangi (EOL Upto 17.07.2010)
Prof. N. R. Mandal
Prof. D. Sen
Prof. O. P. Sha

Centre for Oceans, Rivers, Atmosphere & Land Sciences

Prof. P. C. Pandey

Department of Physics & Meteorology

Prof. R. N. P. Choudhary
Prof. N. Chandra
Prof. B. K. Mathur
Prof. B. K. Samantaray
Prof. S. L. Sharma
Prof. A. Chandrasekar (Lien Upto 28.06.2011)
Prof. S. Veeturi
Prof. S. K. Ray
Prof. A. Taraphder
Prof. K. Kumar
Prof. P. K. Raina

Rajiv Gandhi School of Intellectual Property Law

Prof. I. Dube
Prof. S. K. Nandy

Reliability Engineering Centre

Prof. V. N. Achutha Naikan
Prof. R. B. Mishra

Rubber Technology Centre

Prof. A. K. Bhowmick (Lien Upto 12.07.2014)
Prof. D. K. Tripathy (Lien Upto 30.09.2011)
Prof. G. B. Nando
Prof. D. Khastgir
Prof. T. K. Chaki

School of Medical Science & Technology

Prof. S. K. Guha

Vinod Gupta School of Management
Prof. G. Sinha
Prof. S. Srinivasan
Prof. K. K. Guin
Prof. T. P. Bagchi
Prof. P. S. Das
Prof. P. Mukherjee

Nominated Members

Dr. B. Sutradhar, Librarian
Prof. Arabinda Tripathy, Dean, VGSOM

Registrar (Secretary)

Dr. D. Gunasekaran (up to 04.12.2009)
Dr. T. K. Ghosal (from 05.12.2009)

Students Representative

Sri Shubham Matah (Roll No. 06CH3009)
Sri Prabhat Kumar (Roll No. 06SI2029)
Sri Dibyendu Debnath (Roll No. 08MS6004)
Sri Arindam Chakraborty (Roll No. 06BT9707)
PART - I

DEPARTMENTS CENTRES AND SCHOOLS
DEPARTMENTS, CENTRES AND SCHOOLS

IIT Kharagpur is a wholly residential Institute with a large campus spread over an area of approximately 600 hectares. It has a student population of approximately 7200. The sanctioned faculty strength of the Institute is 529. As per faculty : students ratio of 1 : 10, the faculty strength has to be increased to 720.

The Institute has 19 Departments, 7 Centres and 7 Schools. These are :

Departments :


Centres :

Centre for Educational Technology, Centre for Oceans, Rivers, Atmosphere and Land Sciences, Cryogenic Engineering, Materials Science, Reliability Engineering, Rubber Technology and Rural Development.

Schools :

G. S. Sanyal School of Telecommunications, Rajiv Gandhi School of Intellectual Property Law, School of Information Technology, School of Infrastructure Design & Management, School of Medical Science & Technology, School of Water Resources and Vinod Gupta School of Management.
Aerospace Engineering

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

Agricultural & Food Engineering

B.Tech.- Agricultural & Food Engineering
Dual Degree - Agricultural & Food Engineering / Farm Machinery & Power
Dual Degree - Agricultural & Food Engineering / Soil and Water Conservation Engineering
Dual Degree - Agricultural & Food Engineering / Dairy & Food Engineering
Dual Degree - Agricultural & Food Engineering / Water Resources Development & Management
Dual Degree - Agricultural & Food Engineering / Aqua Cultural Engineering
Dual Degree - Agricultural & Food Engineering / Agricultural Systems & Management
Dual Degree - Agricultural & Food Engineering / Post Harvest Engineering
M. Tech. - Farm Machinery & Power
M. Tech. - Soil and Water Conservation Engineering
M. Tech. - Dairy and Food Engineering
M. Tech. - Applied Botany
M. Tech. - Water Resources Development & Management
M. Tech. - Aqua Cultural Engineering
M. Tech. - Agricultural Systems & Management
M. Tech. - Post Harvest Engineering

Architecture & Regional Planning

B.Arch.
MCP

Biotechnology

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

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
M. Tech. - Hydraulic & Water Resources Engineering
M. Tech. - Transportation Engineering
M. Tech. - Environmental Engineering & Management
M. Tech. - Geotechnical Engineering
M. Tech. - Structural Engineering

**Chemical engineering**  
21

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

**Centre for Ocean, Rivers, Atmosphere and Land**  
06

M. Tech. - Earth System Science and Technology

**Cryogenic Engineering**  
10

M. Tech. - Cryogenic Engineering

**Computer Science & Engineering**  
21

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

**Chemistry**  
29

M.Sc. - Industrial Chemistry  
M.Sc. (2 yr) - Chemistry (upto 2008 admissions)  
M.Sc.- Ph.D. Dual Degree in Chemistry (with effect from 2009 admissions)

**Electronics & Electrical Communication Engineering**  
29

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

Electrical Engineering 28
B.Tech.- Electrical Engineering
B.Tech.- Energy 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 - Energy Engineering / Machine Drives & Power Electronics
Dual Degree - Energy Engineering / Power System Engineering
Dual Degree - Instrumentation Engineering / Control Systems Engineering
Dual Degree - Electrical Engineering / MBA
Dual Degree - Energy Engineering / MBA
Dual Degree - Instrumentation Engineering / MBA
M. Tech. - Machine Drives & Power Electronics
M. Tech. - Control System Engineering
M. Tech. - Power System Engineering
M. Tech. - Instrumentation

Educational Technology 03
M. Tech. - Media and Sound Engineering

Geology and Geophysics 24
M.Sc. - Exploration Geophysics
M.Sc. - Applied Geology
M.Sc.(2 yr)- Geophysics (upto 2008 admissions)
M.Sc.(2 yr)- Geological Sciences (upto 2008 admissions)
M.Sc.- Ph.D. Dual Degree. in Geophysics (with effect from 2009 admissions)
M.Sc.- Ph.D. Dual Degree in Geological Sciences (with effect from 2009 admissions)
M. Tech. - Earth & Environmental Sciences
M. Tech. - Computational Seismology

Humanities and Social Sciences 20
M.Sc. - Economics
M. Tech. - Human Resources Development & Management

Industrial Engineering & Management 10
B.Tech.- Industrial Engineering
Dual Degree - Industrial Engineering / Industrial Engineering & Management
Dual Degree - Industrial Engineering / MBA
M. Tech. - Industrial Engineering & Management

Rajeev Gandhi School of Intellectual Property Law 11
LLB - Intellectual Property Rights

Information Technology 07
M. Tech. - Information Technology

Mathematics 29
M.Sc. - Mathematics & Computing
M.Sc. - Statistics and Informatics (upto 2008 admissions)
M.Sc.(2 yr) - Mathematics (upto 2008 admissions)
M.Sc.(2 yr) - Statistics and Informatics (upto 2008 admissions)
M.Sc.- Ph.D. Dual Degree - Mathematics (with effect from 2009 admissions)
M. Tech. - Computer Science & Data Processing

Mechanical Engineering 44
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
Dual Degree - Manufacturing Science & Engineering / MBA
M. Tech. - Manufacturing Science & Engineering
M. Tech. - Thermal Science and Engineering
M. Tech. - Mechanical Systems Design
M. Tech. - Mechanical Systems Dynamics & Control

Mining Engineering 13
B.Tech.- Mining Engineering
Dual Degree - Mining Engineering / Mining Engineering
Dual Degree - Mining Engineering / Safety Engineering and Disaster Management
Dual Degree - Mining Engineering / MBA
M. Tech. - Mining Engineering

Medical Science & Technology 09
Masters in Medical Science & Technology
M. Tech. - Medical Imaging and Image Analysis
Materials Science
M. Tech. - Materials Science & Engineering

Metallurgical and Materials Engineering
B.Tech.- Metallurgical and Materials Engineering
Dual Degree - Metallurgical & Materials Engineering / Metallurgical Engineering
Dual Degree - Metallurgical & Materials Engineering / MBA
M. Tech. - Metallurgical & Materials Engineering

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

Physics & Meteorology
M.Sc. - Physics
M.Sc.(2 yr) - Physics (upto 2008 admissions)
M.Sc.- Ph.D. Dual Degree in Physics (with effect from 2009 admissions)
M. Tech. - Solid State Technology

Reliability Engineering
M. Tech. - Reliability Engineering

Rubber Technology
M. Tech. - Rubber Technology

Ranbir & Chitra Gupta School of Infrastructure Design and Management
M. Tech. - Infrastructure Design and Management

Water Resources
M. Tech. - Water Management

Vinod Gupta School of Management
MBA
DEPARTMENT OF BIOTECHNOLOGY
DEPARTMENT OF METALLURGICAL & MATERIALS ENGINEERING
PART - II

CENTRALIZED UNITS AND SERVICES & ALUMNI AFFAIRS & INTERNATIONAL RELATIONS
ALUMNI AFFAIRS & INTERNATIONAL RELATIONS

DEAN : Professor Amit Patra

Alumni Affairs & International Relations Committee :

Professor-in-Charge, Information Cell

Prof. B. K. Mathur Department of Physics & Meteorology

Professor-in-Charge of News Letters / Publications

Prof. Joy Sen Department of Architecture & Regional Planning – Chief Editor

Technology Alumni Association Secretariat

Prof. Goutam Bandyopadhyay President
Department of Aerospace Engineering

Dr. Dilip. K. Nanda Secretary
Computer & Informatics Centre

Prof. Kajal Biswas Joint Secretary
Department of Mechanical Engineering

Prof. Joy Sen Treasurer
Department of Architecture & Regional Planning

Officer :

Shri C. Annamalai Assistant Registrar

The various activities of the office of Alumni Affairs & International Relations over the past one year are as follows :

1. The alumni affairs website www.alumnet.iitkgp.ernet.in has been registering alumni all over the globe online throughout the year. Donations have been received through online payment for the Malayesh Banerjee Scholarship.

2. The popular Alumni newsletter “KGPian” is being published regularly. Presently it is running in its 7th year.

3. The 59th Foundation Day of the Institute was celebrated on 18th August, 2009. The 3rd Nina Saxena Excellence in Technology Award, a first of its kind India-wide Technical Innovation Award instituted by IIT Kharagpur in 2006 was presented to Prof. Milind V. Rane, Professor, Department of Mechanical Engineering, IIT Bombay and a team of Professors and research scholars headed by Prof. Ashwini Agarwal, Professor, Department of Textile Technology, IIT Delhi by the Chief Guest Prof.
Kiran Seth, Professor, IIT Delhi and Founder, SPICMACAY. The award consists of a cash prize of Rs. 51,000/- and a gold plated plaque. Commemorating the spirit of Dr. Nina Saxena, B.Tech. (Hons.), ECE 1992, who passed away tragically in 2005, the award is an attempt to encourage and promote technical innovation with a social development focus. The award is the result of a lot of hard work on Nina’s husband, Dr. Akhil Sahai’s part; also our alumnus.

4. Distinguished Alumnus Award was conferred on alumni of IIT Kharagpur who have distinguished themselves in their own domain of work and made their Alma Mater proud during the 55th Annual Convocation held on 8th August 2009. Dr. Amit Goyal, Dr. Subir Chowdhury, Dr. Biswadip (Bobby) Mitra, Prof. Arun G. Phadke, Prof. Kiran Seth and Sri. Arvind Kejriwal were awarded the Distinguished Alumnus Award. Dr. Amit Goyal, Dr. Subir Chowdhury, Dr. Bishwadip (Bobby) Mitra, Prof. Arun G. Phadke and Sri. Arvind Kejriwal received the award in person whereas Prof. Kiran Seth could not attend the function.

5. The New Year brought together the alumni of the Institute again for the seventh time to IIT in the form of 7th Annual Alumni Meet 2010 held during January 8-10, 2010. The Meet was dedicated to those who graduated in the years 1960 and 1985. Many alumni came with their spouses and some with children. To commemorate the occasion a Souvenir, “Yearnings of Yore – Volume VII” was published. The programme consisted of Inauguration & Award Ceremony, a Panel Discussion, Sports events, Hall Reunion, Cultural Programme by ETMS and a musical evening. A small memento was presented to all participants belonging to the Silver Jubilee and Golden Jubilee Batches.

This time, too, the entire function was conducted and organized by the student members of the Alumni Cell.

6. PAN IIT 2009 was held at Chicago, USA during October 9-11, 2009. Prof. Damodar Acharya, Director and Prof. Amit Patra, Dean (AA&IR) attended the event.

7. The 2nd Al Gore Sustainable Technology Venture Competition was held during November 6-7, 2009 at IIT Kharagpur. Candidates were short listed by a selection committee. The teams displayed their presentation in front of the six distinguished Juries, viz., Anjan Rai Chaudhuri, Professor, IIM Kolkata, Prithwis Mukherjee, Professor, VGSM, IIT Kharagpur, Shoummo Acharya, Founder Managing Director & CEO of VI eTrans Pvt. Ltd., Pradeep Ranka, Executive Director, Ranka Group, Saibal Roy, and Sandeep Singhal, Managing Director, Nexus India Capital Advisors. Members of the Organizing Committee, Prof. Oopala Operajita, Chairperson, Al Gore Sustainable Venture Competition, Prof. Amit Patra, Chairman, Local Organizing Committee and Prof. Joy Sen, Convenor, Local Organizing Committee were also present there during the presentation. The Team ECPS, from IIM Bangalore and IIT Bombay won the first prize which included a cash award of Rs.1,00,000.00 (Rupees One lakh only) and a trophy. The Second prize was won by the team Xplorer, from IIT Kharagpur which included a cash award of Rs. 70,000.00 (Rupees Seventy thousand only) and a trophy. Each member of the rest of the six finalists was awarded a certificate of honour. The awards were given away on November 7, 2009 by the US Consul General in Kolkata, H. E. Beth Payne, who congratulated the winners, finalists and IIT Kharagpur.
INSTITUTE LECTURE SERIES

The following guest lectures were organized by the Office of Alumni Affairs and International Relations during the academic year 2009-2010:

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Topic</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof. S. C. Dutta Roy Emeritus Professor and INSA Senior Scientist Electrical Engineering Department IIT Delhi</td>
<td>Teaching and Research – A Lifestyle Option</td>
<td>April 06, 2009</td>
</tr>
<tr>
<td>Prof. Farrokh Mistree Mechanical Engineering Department Georgia Tech. University, Atlanta USA</td>
<td>Being the Professor is the Best Job in the World</td>
<td>June 23, 2009</td>
</tr>
<tr>
<td>Prof. Claude Nicollier Swiss Astronaut</td>
<td>Space Exploration : Why and How with Reference to my Own Experience</td>
<td>August 11, 2009</td>
</tr>
<tr>
<td>Prof. Gautam R. Desiraju Indian Institute of Science Bangalore</td>
<td>Quality and Quantity in Science Education and Research in India</td>
<td>August 26, 2009</td>
</tr>
<tr>
<td>Prof. K. N. Ganesh Bhatnagar Awardee Professor and Director IISER, Pune</td>
<td>Making Medicines out of Nucleic Acids</td>
<td>August 27, 2009</td>
</tr>
<tr>
<td>Dr. Chi-Foon Chan President and Chief Operating Officer Synopsys Inc., USA</td>
<td>A New World of Science and Engineering Partnerships</td>
<td>September 08, 2009</td>
</tr>
<tr>
<td>Prof. H. C. Verma Professor of Physics IIT Kanpur</td>
<td>The Story of Formation of Nuclei</td>
<td>September 11, 2009</td>
</tr>
<tr>
<td>Prof. Anjan Raichaudhuri IIM Kolkata</td>
<td>Marketing of Technological Innovations</td>
<td>November 06, 2009</td>
</tr>
<tr>
<td>Prof. S. K. Panda Department of Pathology AIIMS, New Delhi</td>
<td>Hepatitis E Virus Biology</td>
<td>December 08, 2009</td>
</tr>
<tr>
<td>Dr. Rama Jayasundar Department of NMR Imaging</td>
<td>Di Mystifying Ayurveda</td>
<td>December 11, 2009</td>
</tr>
</tbody>
</table>
AIIMS, New Delhi

Dr. Sudarshan Ghosh Dastidar
Pioneer of In–Vitro Fertilization (IVF) Eminent Embryologist
Member of American Society for Reproductive Medicine (ASRM)
Member of New York Academy of Sciences (NYAS)

Evolution of IVF Technology in India
December 11, 2009

Prof. Vemuri Balakotaiah
John and Rebecca Moores Chair Professor
Chemical Engineering Department
University of Houston, USA

Engineering Challenges in the Development of “Green Automobiles”
December 16, 2009

Prof. Asit K Biswas
Distinguished Alumnus of IIT Kharagpur and President & Academician, Third World Centre for Water Management
Atizapan, Mexico

Water Resources and Management
December 28, 2009

Prof. Yash Pal Singh
Ex-Professor
Electrical Engineering Department
IIT Kharagpur

Higher Technology Education and Preserving Brand IIT
January 12, 2010

Prof. Sanjoy Banerjee
Distinguished Professor of Chemical Engineering
Director of the Energy Institute
City University of New York, USA

Energy at the Turning Point: The Role of Technology
January 13, 2010

Prof. Jai Pal Mittal, FNA; FASc; FNASc; FTWAS

Excitement in Radiation Research
January 18, 2010

Mr. Jatin Das
Eminent Creative Artist and Prolific Figurative Painter

Creativity in Academia and Public Life
February 27, 2010

Prof. Kankan Bhattacharyya, FNA, FASc, FNASc, FTWASc,
Director of Indian Association for the Cultivation of Science
Jadavpur, Kolkata

Rise of Modern Science in India: A National Movement
February 28, 2010

Prof. Dhruba Jyoti Biswas

A Glimpse of the Laser and its Applications
March 17, 2010
VISIT OF THE ALUMNI

Dr. Prabhakant Sinha, Co-Founder and CEO, ZS Associate, USA
Visited IIT Kharagpur during June 7-9, 2009 and discussed on setting up a Centre of Excellence in Bio Energy. Dr. Sinha visited again during January 5-7, 2010 and participated in the International Symposium on Bioenergy held at IIT Kharagpur

Prof. Kiran Seth, Professor, IIT Delhi
Visited IIT Kharagpur on August 18, 2009, the Foundation Day of the Institute. He was awarded Distinguished Alumnus Award 2009 and he was the Chief Guest of the second half programme of that day

Mr. Shail Kumar, Senior Director, External Relations, College of Letters & Science (L&S), University of California, Berkeley
Visited IIT Kharagpur on August 29, 2009 and discussed with Director and other faculty members to explore additional ways to strengthen the UCB-IIT KGP collaboration. Besides he also discussed the IIT Kharagpur’s master plan and Diamond Jubilee celebration plan

Dr. Tirthankar Banerjee, Chief Executive Officer, Solar Energy Company, Australia
Visited on September 19, 2009 and discussed with Director, Deputy Director, Deans and other concerned faculty members on the feasibility of putting 1-2 Mega Watt Solar Photovoltaic Plant in the campus

Mr. Cinna Boddipalli, presently residing in Chicago, USA
Visited IIT Kharagpur during December 7–10, 2009 and prepared a development plan for sustainable fund raising in connection with Diamond Jubilee celebration in consultation with Dean (AA&IR) and other alumni scattering over the country

Dr. J. N. Saha and Dr. Ravi Gupta
Visited IIT Kharagpur during December 21–22, 2009. They met the Director, Dean (AA&IR) and Head, E&ECE Department, visited Halls and also met the Wardens alongwith alumni cell team

Prof. Asit K. Biswas, President & Academician, Third World Centre for Water Management, Atizapan, Mexico
Visited IIT Kharagpur December 28–29, 2009. Prof. Biswas was awarded D.Sc. (Honoris Causa) award. He inaugurated the School of Water Resources; held discussions on possible collaboration in terms of research and training with our new School of Water Resources, including the possibility of developing some Executive Training Programme of senior executives
from the Indian water utilities and Central and State Government officials

Mr. B. K. Gurtu and Mrs. Shobha Gurtu
Visited IIT Kharagpur during January 4–5, 2010. They met the Director, Deputy Director, Dean (UGS), Dean (PGS&R) and Dean (SRIC)

Mr. Arjun Malhotra, CEO, Techspan Inc., New Delhi and Mr. Ajit Gupta
Visited IIT Kharagpur during January 5–6, 2010 and participated in the International Symposium on Bioenergy

Prof. Yash Pal Singh, Ex-Professor, Electrical Engineering Department, IIT Kharagpur
Visited the Institute and joined in the 7th Global Alumni Meet (January 8-10, 2010) and delivered an Institute Lecture on January 12, 2010 on Higher Technology Education and Preserving Brand IIT

Mr. Jitender K. Datta, presently residing in USA
Visited the Institute during February 17–18, 2010 and met Director, Dean (AA&IR) and other Heads of Departments

MEMORANDUM OF UNDERSTANDING SIGNED

The Institute signed Memorandum of Understanding with the following Universities / Industries during the academic year 2009-2010 for the purpose of faculty and student exchange:

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the University</th>
<th>Signed on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Georgia Institute of Technology, Atlanta, Georgia, USA</td>
<td>April 15, 2009</td>
</tr>
<tr>
<td>2.</td>
<td>Central Institute of Fisheries Education, Mumbai</td>
<td>May 21, 2009</td>
</tr>
<tr>
<td>3.</td>
<td>School of Metallurgy and Materials, University of Birmingham, UK</td>
<td>May 29, 2009</td>
</tr>
<tr>
<td>4.</td>
<td>The Regents of the University of California</td>
<td>August 28, 2009</td>
</tr>
<tr>
<td>5.</td>
<td>MOU for setting up of ‘P. K. Sinha Centre for Bio-Energy’ at IIT Kharagpur</td>
<td>August 31, 2009</td>
</tr>
<tr>
<td>6.</td>
<td>MOU signed with Synopsys, Inc., USA for setting up the Synopsys CAD Laboratory at IIT Kharagpur</td>
<td>September 08, 2009</td>
</tr>
<tr>
<td>7.</td>
<td>Wilfrid Laurier University, Waterloo, Ontario, Canada</td>
<td>November 25, 2009</td>
</tr>
<tr>
<td>8.</td>
<td>Ghent University, Belgium</td>
<td>December 04, 2009</td>
</tr>
</tbody>
</table>
9. India Meteorological Department, Ministry of Earth Science, New Delhi  October 2009
10. MOU for creation of Virtual Class-Rooms at IITs over National Knowledge Network (NKN) between National Informatics Centre (NIC), New Delhi and National Informatics Centre Services Incorporated (NICSI), New Delhi with IIT Kharagpur  December 12, 2009
11. Chonnam National University, South Korea  December 28, 2009
12. MOU between Ministry of Railways, GOI and IIT Kharagpur for setting up of ‘Centre for Railway Research’ at IIT Kharagpur  February 13, 2010

As per MoU, the Institute permitted the following students to undergo the academic courses/internship at IIT Kharagpur:

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Student &amp; University</th>
<th>Department &amp; Courses / Internship attended at IIT Kharagpur</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Mr. Nicolas Heine</td>
<td>Department of Mathematics: All courses in 8th Semester of Integrated M.Sc. Programme (Maths &amp; Computing)</td>
<td>100 per cent tuition fee waiver</td>
</tr>
<tr>
<td></td>
<td>Centre for Industrial Mathematics, University of Bremen, Germany</td>
<td>Period: Spring Semester 2009-2010</td>
<td></td>
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<tr>
<td></td>
<td>ii. Mr. Kim USU</td>
<td>Period: Spring Semester 2009-2010</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Mr. Ehlers Cedric</td>
<td>Department of Architecture &amp;</td>
<td></td>
</tr>
</tbody>
</table>
Technische Universitat Munchen, Germany

Regional Planning:

Academic Year 2009-2010

4. Mr. Jan-Hernik Meier,
A Masters student of Geography
Leibniz University, Hannover
Germany

Department of Agricultural & Food Engineering:

Stipend @ Rs. 5000/- per month

Student Internship:

Area: Irrigation Methods and Food Security

Period:
27th January – 15th May 2009

DISTINGUISHED VISITORS

Details of Distinguished Visitors during the period 2009-2010

<table>
<thead>
<tr>
<th>#</th>
<th>Name &amp; Details of Visitors</th>
<th>Date of Visit</th>
<th>Purpose of Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>i) Prof. Claude Nicoller, Swiss Astronaut</td>
<td>August 11, 2009</td>
<td>Delivered an Institute Lecture on &quot;Space Exploration : Why and how, with reference to my own experience&quot;</td>
</tr>
<tr>
<td></td>
<td>ii) Mr. Mattia Celio, Scientific Counselor of Swiss Embassy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Prof. (Dr.) Syed Manal Shah Alquadri Ambassador of India to Uzbekistan Embassy of India</td>
<td>August 31, 2009</td>
<td>Met with Director &amp; Dean (AA&amp;IR) and discussed the matters of educational cooperation</td>
</tr>
<tr>
<td></td>
<td>Tashkent, Uzbekistan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>i) Mr. P. Lecomte</td>
<td>October 27, 2009</td>
<td>Discussed / interacted with concerned faculty members and made a comprehensive presentation to students</td>
</tr>
<tr>
<td></td>
<td>Executive Director</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Advanced Master in Financial Engineering ESSEC, Singapore Campus</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii) Ms. Nusrat Hossain Campus France Education Advisor ESSEC, Singapore Campus</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii) Mr. Laurent Reyes In Charge of University Cooperation in West Bengal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Delegation from M/s TOTAL, France</td>
<td>November 04–05, 2009</td>
<td>Signed MoU between M/s TOTAL France and IIT Kharagpur for creating a Chair</td>
</tr>
</tbody>
</table>
5 Ms. Beth A. Payne
US Consul General
November 07, 2009
Professorship position in Mining Engineering at IIT Kharagpur

6 Prof. Sylvain Ferrari
Prof. Mathis Plapp
Ecole Polytechnique, France
November 15-17, 2009
Discussed about a potential collaboration between IIT Kharagpur and Ecole Polytechnique, France, to develop student exchange programme for research internships, student exchange at Master's level, and joint supervision of PhD students for cooperation on joint research projects

7 Prof. Seetharam and Dr. Laxmi
Institute of Water Policy
Lee Kuan Yew School of Public Policy
National University of Singapore
January 03-04, 2010
Delivered an institute lecture

8 Prof. Sanjoy Banerjee
Distinguished Professor of Chemical Engineering
Director, The Energy Institute
The City University of New York
City College, Steinman Hall
140th St & Convent Ave
New York, NY 10031
(Alumnus of Chemical Engineering, IIT KGP, 1970)
January 12-13, 2010
Delivered an Institute Lecture on “Energy at the Turning Point : The Role of Technology”. Discussed educational cooperation with Dean (AA&IR) and other concerned faculty members

9 Prof. Sujit Banerji
Professor of Operations Management
Executive Director, WMG, School of Engineering,
University of Warwick,
March 02, 2010
Discussed the 5 interns for this summer in the 5 research areas agreed to already, as well as other relevant activities and other ideas in the MOU
10 March 17, 2010 (Cuban Delegation) Met with Director and Dean (AA&IR), visited SIT

1. Ms. Daisy Oropesa, Director of the Enterprise ALBERT from the University of Communications and Informatics
2. MCs Humberto Arango, Director of Enterprise DATYS
3. Ing. Marina Capo Rivalta, Advisor from the Ministry of Informatics and Communications
4. Dr. Leonel Iriarte Navarro, Vice Rector CITL, Institute of Information Technology of Cuba.
5. Mr. Luis Javier Baro Baez, First Secretary, Cuban Embassy

11 March 30, 2010

i) Dr. Rita Sharma, Senior Adviser, Science & Innovation, British High Commission Delhi

ii) Chris Darby, Head of Science and Innovation, British High Commission

12 March 31, 2010

Mr. Pascal Casanova, Group Senior Vice President - R&D, Lafarge France

Discussed with Dean (AA&IR) and other concerned faculty members to get acquainted with the research conducted by IIT Kharagpur in the field of cement and concrete and to explore a possibility of setting up a partnership to do research on concrete and material science as well as sustainable construction including the sponsoring of equipments or specific research projects.
ADVANCED TECHNOLOGY DEVELOPMENT CENTRE

CHAIRMAN :  Professor Partha Pratim Chakrabarti

FACULTY ASSOCIATED

Professor :

**Chakrabarti, P. P.**  
Computer Science & Engineering  
Ph.D., Artificial Intelligence, CAD for VLSI Design of Algorithms, Formal Verification

**Lahiri, S. K.**  
Advisor, Sponsored Research & Industrial Consultancy  
Ph.D., Microelectronics, VLSI, MEMS, Integrated optics

**Sen, S. K.**  
Advisor, Sponsored Research & Industrial Consultancy  
Ph.D., Advanced Plant Genetics.

**Sengupta, S.**  
Electronics & Electrical Communication Engineering  
Ph.D., Computer Vision, Multimedia

**Biswas, D.**  
Electronics & Electrical Communication Engineering  
Ph.D., III-V Semiconductor Device Technology

**Patra, A.**  
Electrical Engineering  
Ph.D., VLSI Design of Power Converters, Industrial Information Technology

**Basu, A.**  
Computer Science & Engineering  
Ph.D., Embedded Systems, Artificial Intelligence Application

**Roy, S. K.**  
Physics & Meteorology  
Ph.D., Solid State Physics, Thin Film, Nanotechnology

**Pal, S. P.**  
Computer Science & Engineering  
Ph.D., Computational Geometry, Design and Analysis of Algorithms

**Bhattacharyya, B.**  
Civil Engineering  
Ph.D., Structural Engineering, Reliability

**Bhattacharyya, T. K.**  
Electronics & Electrical Communication Engineering  
Ph.D., Microelectronics, VLSI, MEMS

**Jacob, Chacko**  
Material Science  
Ph.D., Wide Bandgap Semiconductors/ Nanomaterials / Direct Fluorination of Materials / Oxide semiconductors

**Banerjee, Pallab**  
Material Science  
Ph.D., Semiconducting Materials, Materials for Energy Conversion : Photovoltaic and Thermoelectric, III-V

**Associate Professor :**  

**Banerjee, Pallab**  
Computer Science & Engineering  
Ph.D., VLSI CAD & Electronic Design Automation

**Pal, S. P.**  
Computer Science & Engineering  
Ph.D., Micro Fluidics
and II-VI MOCVD, Organic Semiconductor

Assistant Professor:

Dhar, A.
Physics & Meteorology
Ph.D., Condensed Matter Physics, Nanotechnology

Das, S.
Medical Science & Technology
Ph.D., MEMS and Microsystems including Bio-MEMS and Bio-Transducers, Microelectronic Devices, Medical Instrumentation and Medical Chip Design.

Mandal, Pradip
Electronics & Electrical Communication Engineering
Ph.D., CAD for CMOS Analog VLSI, Analog Circuit Design

Officer:

Gangopadhyay, Pranabendu
Senior Scientific Officer
Ph.D., Microphotonics, Integrated Optics, Fiber Optics, MOEMS, Microelectronics.

LABORATORIES INVOLVED

i) MEMS and Microelectronics Laboratory
ii) MEMS Design Centre
iii) Microphotonics Laboratory
iv) Kalpana Chawla Space Technology Cell
v) Microscience Laboratory
vi) Advanced VLSI Laboratory
vii) Advanced Laboratory for Plant and Genetic Engineering
viii) Communication Empowerment Laboratory
ix) Optel-IIT Fiber-Optic Center

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities

Micromachining and MEMS are one of the major areas of research at Advanced Technology Development Centre. In addition to that, the fabrication of silicon and non silicon based microelectronic devices and ICs are also focused area of research at different laboratories under ATDC. Several government departments including NPSM/ADA, ISRO, DRDO, DST and BARC have funded projects to develop microsensors for special applications. During the last one year the MEMS devices developed in the laboratory include silicon piezoresistive accelerometer and micro thruster and flow sensors. The technology for fabrication of silicon accelerometer has been transferred to Semiconductor Complex Limited, Chandigarh. Activities have been started on development of high sensitive MEMS accelerometer based on quantum tunneling phenomena and silicon MEMS pressure sensor.

Design and development of MEMS based micropropulsion devices for micro/nano satellite programme such as Microthruster, Microvalve and Micropump.
The MEMS design laboratory, a national facility created under NPSM programme is actively involved with design work on MEMS including microfluidic devices. A number of students from various departments like ATDC, E & ECE, Electrical, Mechanical, Biotechnology, Material Science Department / Centre are involved in the Design Centre to do their project / thesis works. Other academic Institutions like Jadavpur University and CMERI, Durgapur, are also involved in the Design Centre. Research and development is also undertaken in the field of Integrated Optics. An integrated-optic design software have been developed and copyrighted. Fabrication and characterization of titanium indiffused lithium niobate waveguides, directional couplers, power splitters, switches for fiber-optic communication networks have been performed. Research is being carried out on thin film nanostructures, semiconductor, ferroelectric and magneto-resistive films for microelectronics and sensor applications under various government sponsored projects at MicroScience Laboratory of Dept. of Physics & Meteorology. A number of thrust areas have now emerged based on core competency available in the Advanced VLSI Laboratory. These include analog and RF circuits, wireless communication and Baseband processing, direct conversion receivers, power management circuits, processors and IP cores for embedded applications and design for testability. More than 60 different chips have been fabricated and tested. 15 leading companies have joined the AVLSI Consortium. More than 12 ongoing collaborative research projects funded by the Govt. of India and leading companies including National Semiconductors, Intel, Synopsys, Infineon, Texas Instruments, Si2 Microsystems, Agilent, Tessolve, Analog Devices and General Motors. The laboratory also offers regular intensive training to students of IIT Kharagpur. Buoyed by these initial successes, the laboratory is striving to attain still higher levels of excellence. Research directions are diversifying to new areas of mixed-signal SOCs, IP cores for embedded applications and analog DFT. Existing expertise on formal verification and optimization methods is being applied to design verification, synthesis and CAD Tool development for the deep sub-micron processes. More than fifty Doctoral and Masters students are working on various emerging areas. The Centre for Theoretical Studies (CTS) is primarily engaged to generate and nucleate theoretical research on fundamental aspects of basic and engineering sciences.

The Advanced Laboratory for Plant Genetic Engineering is dedicated to develop technologies suitable to enhance the productivity potential of some of our major crop plants through biotechnological approach. The laboratory has met with some success in identifying specific genetic elements associated with fiber development in jute stem through functional genomic approach. Additionally, attempts to map the individual seven linkage groups of jute are underway. Discovery of certain plant genes and regulatory elements involved in the metabolic pathway of fatty acid synthesis and modification of their functional role in case of synthesis of seed oil of Indian mustard (Brassica juncea), are in active state of pursuit. Additionally, attempts have been initiated to genetically tamper the lignin biosynthetic pathway in vegetative parts of jute and sorghum plants by anti-sense approach. Major attempts have also been made in strategy development for generation of genetically modified crop plants resistant against insect pests belonging to lepidoptera, coleoptera and homoptera. Some success could be attained in case of cotton, Brassica and rice. Discovery of novel insecticidal genes from plants and bacteria and generation of transgenic crop plants expressing these insecticidal genes have been accomplished. Attention has also been directed towards development of efficient transformation methods for certain recalcitrant crop plants that have not yet been accessible to gene transfer methodologies. Further, development of marker free transgenic plant generation and site-specific integration of transferred DNA have figured as major targets of activities in order to enhance the efficacies of gene transfer techniques to a great height. The laboratory has also developed a microbial bioprocess
technology using the state of the art of bio-film technology for high through-put production of superior quality of jute fibers. The technique reduces production time by ~70% and results significantly low effluents and green house gases. The process thus developed is safe for human handling and offers excellent quality control ensuing at least 2-3 grades better fiber quality against methods that are in use by the jute growers. Further, attempts to explore the possibilities for generation of jute fiber based bio-composites have also been initiated. The laboratory is further working on microbial bio-film based technology for high through-put production of specific carbohydrate macerating enzymes that carries industrial significance.

**Thrust Areas**

Inertial MEMS, Micro Sensors and actuators for automobile, space, and defense applications, micropropulsion device for micro/nano satellite application, RF-MEMS, Bio-MEMS, Semiconductor devices, Nanotechnology, Lithium niobate integrated optics, Microstructuring of SU-8, Astrophysics, Cosmology, Nonlinear Sciences, Theoretical condensed matter physics, Wireless communication and Baseband processing, Analog and RF circuits, Plant biotechnology.

**New Acquisitions**

MEMS vaporising liquid microthruster, Microflow for microvalve, micropump, MEMS flow sensors, Integrated-optic switch, MEMS accelerometer for aircraft motion sensing. Tunneling accelerometer and Capacitive accelerometer, SU-8 microneedles.

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects**

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the project</th>
<th>Sponsor(s)</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Indo-US Joint Centre on Advanced and Futuristic Manufacturing</td>
<td>Indo-US Science &amp; Technology Forum</td>
<td>Ongoing</td>
</tr>
<tr>
<td>2.</td>
<td>Development of Silicon Microsensors for Flow Measurement</td>
<td>MHRD, New Delhi</td>
<td>Ongoing</td>
</tr>
<tr>
<td>3.</td>
<td>Design, analysis and optimization of navigation grade silicon based MEMS accelerometer</td>
<td>ISRO-KCSTC Cell</td>
<td>Ongoing</td>
</tr>
<tr>
<td>4.</td>
<td>Upgrading facilities for MEMS design activities at national resource centre</td>
<td>ADA, Bangalore</td>
<td>Ongoing</td>
</tr>
<tr>
<td>5.</td>
<td>Development of MEMS based components for RF applications</td>
<td>ADA, Bangalore</td>
<td>Ongoing</td>
</tr>
<tr>
<td>6.</td>
<td>Development of MEMS based accelerometers for Aerospace applications</td>
<td>ADA, Bangalore</td>
<td>Ongoing</td>
</tr>
<tr>
<td>7.</td>
<td>MEMS based micro-propulsion devices for micro-satellite programme</td>
<td>ISRO, Bangalore</td>
<td>On-going</td>
</tr>
<tr>
<td>8.</td>
<td>Multi-scale modeling to study the role of atomic scale defects in CNT-based nanocomposites</td>
<td>DST, New Delhi</td>
<td>On-going</td>
</tr>
<tr>
<td>No.</td>
<td>Title</td>
<td>Sponsor/Institution</td>
<td>Status</td>
</tr>
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<tr>
<td>9</td>
<td>Effects of non-linearity and viscoelasticity of blood and wall tissues and magnetohydrodynamic effects on the flow field in arteries in normal and pathological states (ENV)</td>
<td>CSIR, New Delhi</td>
<td>On-going</td>
</tr>
<tr>
<td>10</td>
<td>Kinematics of flows in diverse contexts</td>
<td>DST, New Delhi</td>
<td>On-going</td>
</tr>
<tr>
<td>11</td>
<td>Measuring the HI power spectrum with the GMRT</td>
<td>BRNS, DAE, Mumbai</td>
<td>On-going</td>
</tr>
<tr>
<td>12</td>
<td>Targeted gene integration in rice and cotton</td>
<td>ICAR, New Delhi</td>
<td>On-going</td>
</tr>
<tr>
<td>13</td>
<td>Establishment of independence of Linkage Groups of jute through trisomic analysis in order to construct the genetical and physical map of jute genome</td>
<td>DBT, New Delhi</td>
<td>On-going</td>
</tr>
<tr>
<td>14</td>
<td>Application of technology for tomato hybrid seed industry involving rural women for employment and income generation</td>
<td>DST, New Delhi</td>
<td>On-going</td>
</tr>
<tr>
<td>15</td>
<td>Recombinant DNA for development of a male-sterility system in jute.</td>
<td>DBT, New Delhi</td>
<td>On-going</td>
</tr>
<tr>
<td>16</td>
<td>Generation and cataloguing of bast fibre developmental stage specific EST library from jute</td>
<td>DBT, New Delhi</td>
<td>On-going</td>
</tr>
<tr>
<td>17</td>
<td>Design and fabrication of high sensitivity micro machined silicon tunneling accelerometer with micro-g resolution</td>
<td>ISRO, Bangalore</td>
<td>On-going</td>
</tr>
<tr>
<td>18</td>
<td>Development &amp; characterization of nanostructured thin films for SiGe quantum well infrared photodetector and ferroelectric based gas/chemical sensors</td>
<td>DRDO, New Delhi</td>
<td>On-going</td>
</tr>
<tr>
<td>19</td>
<td>Terahertz emission of Si/SiGe structures doped with shallow acceptors</td>
<td>DST, New Delhi</td>
<td>On-going</td>
</tr>
<tr>
<td>20</td>
<td>Synthesis and characterization of nanostructured materials for functional and structural applications</td>
<td>DST, New Delhi</td>
<td>On-going</td>
</tr>
<tr>
<td>21</td>
<td>Fabrication and characterization of Novel Photonic Crystal Structures and Si/Ge Quantum Dots for Photonic Applications</td>
<td>DST-ITPAR, Italy</td>
<td>On-going</td>
</tr>
<tr>
<td>22</td>
<td>Design, analysis and optimization of navigation grade silicon based MEMS accelerometer</td>
<td>ISRO-KCSTC Cell</td>
<td>On-going</td>
</tr>
<tr>
<td>23</td>
<td>Medical image analysis and MEMS based flow sensor development</td>
<td>Texas Instruments</td>
<td>On-going</td>
</tr>
</tbody>
</table>
24. Feasibility study of MEMS based biochip platform for characterisation of biospecies
   IIT Kharagpur  On-going

25. Effects of non-linearity and viscoelasticity of blood and wall tissues and magnetohydrodynamic effects on the flow field in arteries in normal and pathological states (ENV)
   CSIR, New Delhi  On-going

26. Kinematics of flows in diverse contexts (KFD)
   DST, New Delhi  On-going

27. Measuring the HI power spectrum with the GMRT (MRT)
   BRNS, DAE, Mumbai  On-going

28. All India Coordinated Research Project on Post Harvest Technology
   ICAR, New Delhi  On-going

29. A Value Chain on Aloe Vera Processing
   ICAR, New Delhi  On-going

30. Development of Silicon Carbide Thin Films for High Temperature and High Power Devices
   DRDO, New Delhi  On-going

31. All India Coordinated Research Project on Post Harvest Technology
   ICAR, New Delhi  On-going

32. Development of a MEMS based assay for biomedical diagnostics.
   ISRO-IIT Kharagpur Cell  On-going

33. Development of SU-8 based microstructures for Integrated-Optic and Bio-applications
   IIT Kharagpur  On-going

34. Synthesis of functional groups for immobilization of functional proteins on MEMS based micro-sensor surfaces
   Indo-Trento Program for Advanced Research  On-going

Consultancy Projects :

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the project</th>
<th>Sponsor(s)</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Development and realization of high Q-factor quartz double ended tuning forks using micromachining technology</td>
<td>ISRO-IISU</td>
<td>On-going</td>
</tr>
<tr>
<td>2.</td>
<td>Development of ADC and Receiver for wireless applications</td>
<td>Si2 Microsystems</td>
<td>On-going</td>
</tr>
<tr>
<td>No.</td>
<td>Topic</td>
<td>Institution</td>
<td>Status</td>
</tr>
<tr>
<td>-----</td>
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</tr>
<tr>
<td>3.</td>
<td>Design of RFIC modules</td>
<td>National Semiconductor Corporation, USA</td>
<td>On-going</td>
</tr>
<tr>
<td>4.</td>
<td>Design and processing of MEMS microstructure for mechanical property evolution</td>
<td>DMRL, Hyderabad</td>
<td>On-going</td>
</tr>
<tr>
<td>5.</td>
<td>Thin Film Characterization</td>
<td>Various agencies</td>
<td>On-going</td>
</tr>
</tbody>
</table>

**VISITS ABROAD BY FACULTY MEMBERS**

1. Dr. T. K. Bhattacharyya
   - Indo–Trento programme for advanced research
   - ITPAR programme, Italy, June 2009
2. Dr. T. K. Bhattacharyya
   - GSI, Darmstadt, Germany, (to attend CBM-DASQ meeting on invitation), 7 days
3. Dr. P. Gangopadhyay
4. Dr. C. Jacob
   - Chungnam National University and Kookmin University, South Korea (Guest Lectures and collaboration discussions), October 28 – November 1, 2009
5. Dr. C. Jacob
   - MTEC, Thailand (Guest Lectures and collaboration discussions), November 1–3, 2009
6. Dr. C. Jacob
   - University of California, Irvine and Northwestern University, USA (Attend Indo-US Symposium on Fabrionics and collaborative research), June 27 – July 10, 2009

**INVITED LECTURES BY FACULTY MEMBERS**

1. Prof. S. K. Ray
   - Semiconductor Nanostructures for Device Applications at Institute of Radio Physics & Electronics, Kolkata University
2. Prof. S. K. Ray
   - Nanoelectronic and Sensing Devices at IIT Delhi
3. Prof. S. K. Ray
   - Excitements in Nanoscience at Vidyasagar College, Kolkata
4. Prof. S. K. Ray
   - Semiconductor Nanotechnology for Electronic Devices at UGC State Level Seminar on “Fundamentals & Frontiers in Physics”, 22nd September, Garbheta
5. Prof. S. K. Ray
   - Semiconductor Nanostructures for Futuristic Devices at Annual Convention of Indian National Academy of Engineering, Goa
6. Dr. Soumen Das
   - BioMEMS at NEHU, Shillong, March 25–27, 2010
7. Dr. Soumen Das
   - Mobile diagnostics : A MEMS perspective at Texas Instruments, Bangalore, October 26–27, 2009
8. Dr. Soumen Das  
   R&D activities on MEMS at IITKGP at IIT Bombay, March 17, 2010

9. Dr. Soumen Das  
   Introduction to MEMS at IIT Kharagpur, July 3–17, 2009

10. Dr. Chacko Jacob  
   Micro and Nano-structured Materials at 1st Indo-German Frontiers of Engineering Symposium, Chennai, October 1–4, 2009

11. Dr. P. Gangopadhyay  
   Integrated Optic Devices at a Seminar on “Journey of Fiber Optics” with Nobel Laureate, Dr. Charles Kao, IIT Kharagpur, November 15, 2009

12. Dr. T. K. Bhattacharyya  
   MEMS based Inertial Sensors at CGCRI, Kolkata

13. Dr. T. K. Bhattacharyya  
   MEMS based accelerometer : g to micro-g at North Eastern Hill University, Shillong

LECTURES BY VISITING EXPERTS

1. Mr. Sourabh Datta Chowdhury, Maxim Integrated Products, California, USA  
   Ongoing research activities at Maxim. 2009

BOOK PUBLISHED

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Author(s)</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
</tr>
</thead>
</table>

PATENTS GRANTED


2. A patent application on “The technology which leads to improved production of bast fibers using bacterial biofilm’ is presently placed on the “Technologies Developed” Web-portal of IIT Kharagpur

3. Nobel Diamond Like Nanocomposite material use for biocompatibile coating application, patent application no. 896/kOL/2008

LAURELS & DISTINCTIONS

1. Dr. P. Gangopadhyay  
   Royal Society Incoming Fellowship to UK
COLLABORATIVE EFFORTS

1. A joint collaboration research project on "Development of micromechanical inertial and flow sensors for environmental / biomedical application" sponsored by DST, Govt. of India in going on under an Indo-Italian research programme. (ITPAR). Collaborating Institute - ITC -irst. Trento, Italy
2. A Proposal on "Indo - US centre for advanced and futuristic manufacturing" has been submitted by IIT Kharagpur to Indo-US Science and Technology forum. Under this proposal Advanced Technology Development Centre, IIT Kharagpur will be a partner institution
3. A joint collaborative research project on “Rapid prototyping technique to write photonic structures using femtosecond laser” is submitted to EPSRC along with ORC, University of Southampton, UK

FACILITIES NEW ADDITION

1. Recently IIT Kharagpur has installed a new novel custom made MBE (Molecular Beam Epitaxy) machine, Riber France made. The versatile MBE system is Compact, flexible and affordable with features carefully designed to meet the highest specifications for the research of all III-V compound semiconductor materials. This is a "Vertical Reactor" technology, with 3-inch wafer diameter integrated system. The MBE has Arsenide and Nitride growth facilities with 6 cells. Out of the 6 cells, one is Arsenic valved cracker which allows evaporating As$_2$ and As$_4$ both the allotropes. The presence of cracker cell gives us the flexibility to maintain As$_2$:As$_4$ ratio for optimizing the Gallium Arsenide growth along with reloading of As without disturbing the chamber vacuum. Also the machine has both Ammonia (NH$_3$) and plasma N$_2$ sources for Gallium Nitride growth. Ammonia will be used for thick film growth and plasma N$_2$ for very fine structures. Besides, the MBE has double dopant (Si and Mg) cell for acceptor and donor impurities. The cryogenic pump is used for 10$^{-11}$ Torr vacuum and the pump is water cooled. So, uninterrupted water supply to the pump is essential to maintain the vacuum system. The uninterrupted power supply to the system is at the same time important to power the cryo-pump, turbo-molecular pump, computer, HMI and all the cells. For that a custom designed UPS & generator system has been successfully installed
2. Recently a Network Analyser, N5242A, 10 MHz-26.5 GHz has been installed and functional

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA ORGANIZED

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Seminars / Workshops / Conferences / Symposia</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Third National Conference on “MEMS, smart structures and materials, ISSS MEMS 2009”, at CGCRI, Kolkata</td>
<td>3 days</td>
</tr>
<tr>
<td>2</td>
<td>Workshop on “MEMS accelerometer”, at IIT Kharagpur</td>
<td>1 day</td>
</tr>
<tr>
<td>3</td>
<td>Workshop on “MEMS CAD”, at IIT Kharagpur</td>
<td>2 days</td>
</tr>
</tbody>
</table>
COMPUTER & INFORMATICS CENTRE

HEAD: Professor Prabir Kumar Biswas

Officer:

Nanda, Dilip Kumar  M.Sc., DIIT, Ph.D. (IIT Kharagpur), IT Infrastructure Management and Operations, Application Software & Numerical Techniques
Partha Goswami  B.Tech. (CU), M.Tech. (IIT Kharagpur), Enterprise & Optical Transport Network
Pramod Kumar Singh (On lien)  B.Tech., M.Tech., Ph.D. (IIT Kharagpur), Algorithm and Data Network
Devshri Roy  B.Tech., M.Tech., Ph.D. (IIT Kharagpur), Artificial Intelligence, DBMS
Bimal Kanti Dutta  M.Sc., PGDCS (Roorkee University), DBMS, OS, Algorithms, Computer Networks, Distributed DBMS & Graphics Programming.
Surid Kumar Das  B.Tech., M.Tech. (Rajasthan Vidyapith, Deemed University), Hardware, Computer Network
A. Chattopadhyay  M.Sc, MS (IIT Kharagpur), Hardware, OS, Network Security & Applications
Sudipto Das  B.Tech., M.Tech. (Rajasthan Vidyapith, Deemed University), OS, Network Applications and Security

FACILITIES

(i) Networking Facilities

The Institute has a wired Gigabit Ethernet campus wide network with optical fiber backbone spread over Academic and Hall areas. It is one of the biggest network setup in the region that caters to approx 10,000 users. In addition to the two high bandwidth STM1 connections existing in the Institute for the user community which is being utilized properly, access is also available to the 1 Gbps redundant bandwidth connectivity provided by the National Knowledge Network.

Following new network connections/components have been added to the Institute backbone network:

(i) Network connectivity in the newly constructed Rajiv Gandhi School of Intellectual Property Law (RGSOIPL)
(ii) Extension of the network to the 2nd Floor of Ashutosh Mukherjee Hall of Residence (AM)
(iii) Extension of the network to the 2nd floor of Mother Teresa Hall of Residence (MT)
(iv) Extending dedicated gigabit connectivity from CIC to the ERP Development Lab in the Industrial Engineering & Management Department for the hosting of the ERP Servers.

(v) Installation of a Proxy Server Load-balancing Switch at CIC to distribute client requests among the proxy servers for efficient use. It will allow all the proxy servers to be represented by a single virtual IP address to internal clients also provide a failover across the group of proxy servers.

(vi) Upgrade and strengthen the Central Library network backbone infrastructure for speed and reliability enhancement.

(vii) Network expansion in the new Annex III building of Mining Engineering Department

(viii) Extending and strengthening the network connectivity’s of the extension centers at Bhubaneswar and Kolkata for running the post graduate program thru video conferencing.

(ix) Integrating the National Knowledge Network with the Institute network

(ii) Network Facilities Being Created

Network design and implementation due to extension of Hall of Residences in phases

Phase – I, the network extension is being carried out in the Radha Krishnan Hall of Residence (RK), Rajendra Prasad Hall of Residence (RP), Patel Hall of Residence (PH), Azad Hall of Residence (AH), Nehru Hall of Residence (NH), Gokhale Hall of Residence (GH) and Zakir Hussain Hall of Residence (ZH) to provide for an additional 1403 new connections

Phase – II, the network extension is to be done for 857 students in the Azad Hall of Residence (AH),

Adhoc wireless connectivity has been provided in the halls as well as the hospital for the students

(iii) Laboratory Facility

One of the three student’s laboratories would be equipped with state of art thin clients and the other two would be using PC’s in order to cater to high end Engineering graphics laboratory classes. The centre would also have a thin client based student’s terminal room which would be available to them round the clock. The laboratories as in the earlier years are being utilized to the fullest by engaging them to support the Institute Training & Placement activities, various short term courses as well as IT related festivals organized by different Departments / Centers / Schools. In addition to this the laboratories are also being utilized for the techno fest Kshitij and online registration of UG and PG students every semester.

(iv) Software Facility

Institute has procured 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 has also been procured for the faculty, staff and students of the Institute.

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), SPSS (statistical package) etc.
CONTINUING EDUCATION CENTRE

DEAN :   Professor Ajay Chakrabarty

FACILITIES

(i) Transit Hostel Accommodation for 40 Beds Capacity
(ii) Three Studios at Kolkata, Bhubaneswar and Kharagpur Seating Capacity (40+4+60)

(a) Equipments

(i) Lap Top (Three numbers)
(ii) High luminosity overhead projectors.
(iii) LCD Panel for multimedia projection.
(iv) 3M Multimedia Projector.
(v) Shure cordless microphone and transmitter/receiver set.
(vi) Ahuja tape recorder and public address system.

(b) Software

(i) Distance Education Database (from International Centre for Distant Learning)
(ii) KOMPASS Industrial Directory of India giving details of over 60,000 companies
(iii) Macromedia Authorware (4.0.6 licences)
(iv) Adobe Photoshop - graphics package
(v) Microsoft Front Page Express - for Web page development
(vi) Microsoft Office 2000 Professional
(vii) Microsoft Windows 2000 Professional
(viii) Microsoft Windows 2000 Server with terminal server facility
(x) ALGOR FEM package for stress fluid flow and electrostatic field analysis

PARTICULARS OF M.TECH AND PH.D SCHOLARS JOINED/COMPLETED

(i) No. of Teachers completed Ph.D. degree : 15
(ii) No. of Teachers completed M.Tech. programme : 14
(iii) No. of Teachers joined Ph.D. programme : 12
(iv) No. of Teachers taking advance admission to Ph.D. programme : 13
(v) No. of Teachers joined M.Tech. programme : 15

CD CELL ACTIVITIES

(i) Manuscripts for text books completed : 01
(ii) No. of Text books approved : 01
(iii) No. of CAI packages approved : 00
SEMINARS / WORKSHOPS / CONFERENCES ORGANIZED BY THE UNIT

(i) Total No. of Workshops / Conferences Organized : 14
(ii) Total No. of participants attended : 364+

(a) Short Term Courses Organized

<table>
<thead>
<tr>
<th>#</th>
<th>Short term courses organized under</th>
<th>No. of Courses</th>
<th>No. of participants</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>QIP (AICTE) Short Term Courses</td>
<td>10</td>
<td>393</td>
<td>11 Weeks</td>
</tr>
<tr>
<td>2.</td>
<td>MHRD/AICTE Special Summer Short Term Courses</td>
<td>14</td>
<td>481</td>
<td>21 Weeks</td>
</tr>
<tr>
<td>3.</td>
<td>MHRD/AICTE Special Winter Short Term Courses</td>
<td>17</td>
<td>588</td>
<td>23 Weeks</td>
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<tr>
<td>4.</td>
<td>Sponsored/Self finance Short term courses</td>
<td>52</td>
<td>1560</td>
<td></td>
</tr>
<tr>
<td>Total ::</td>
<td></td>
<td>93</td>
<td>3022</td>
<td></td>
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</tbody>
</table>

(b) M. Tech. Programme organised

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Subject</th>
<th>No. of Students</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Electrical Engineering</td>
<td>17</td>
<td>3 Years</td>
</tr>
<tr>
<td>2.</td>
<td>Electronics and Electrical Communication Engineering</td>
<td>22</td>
<td>3 Years</td>
</tr>
</tbody>
</table>
CENTRAL RESEARCH FACILITY

CHAIRMAN : Professor Indranil Manna (upto November 30, 2009)
Professor Rahul Mitra (from December 01, 2009)
(Materials Science Division)
Professor Ananta Kumar Ghosh (from December 01, 2009)
(Life Science Division)

FACULTY ASSOCIATED

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. I. Manna In charge, FESEM, XRD, HRXRD (upto 30.11.09)
Prof. S. K. Pabi In charge, XRD, HRXRD w.e.f. 1.12.09
Prof. J. Dutta Majumder In charge, FE-SEM (w.e.f. 1.12.09)
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. T. Pathak In charge, Mass Spectrometer
Prof. S.B. Singh In charge, OES
Prof. J. Dutta Majumder In charge, Optical Microscopy (w.e.f. 1.12.09)
Prof. B. K. Dhindaw In charge, Optical Microscopy (upto 30.11.09)
Prof. P. Roy Chowdhury In charge, Optical Fibre
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

Senior Scientific Officer :

Datta, Amal Kumar Ph. D. (IIT Kharagpur), Experimental & Theoretical Condensed Matter Physics

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities :
Life Science Division :

i) 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, ALPGE).

ii) DNA Sequencer; Real time Polymeric Cyclic Reaction (PCR) analyzer, 2-Dimensional gel electrophoresis Laboratory : This equipment is used to determine nucleotide sequence of DNA samples provided by different investigators (students, scholars and faculty of the department of Biotechnology, SMST, ALPGE and AgFE).

iii) 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).

iv) 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, DNA 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.

v) High Pressure Liquid Chromatography Laboratory : HPLC is an efficient technique used for the separation of macro/micro molecules such as organic compounds, 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.

vi) 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.

vii) Protein Crystallography : Protein X-ray Crystallography (PX) Laboratory : Rigaku Micromax 007HF X-ray generator is equipped with RaxisIV++ detector and X-stream 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.

Materials Science Division :

viii) 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.
ix) **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.

x) **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 magneto-resistance 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.

xi) **High Resolution Transmission Electron Microscope Laboratory** : The HRTEM laboratory is equipped with the JEOL JEM-2100 High Resolution Transmission Electron Microscope, OXFORD 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 detects 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.

xii) **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 it’s quantitative analysis (from the intensity of spectrum).

xiii) **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.

xiv) **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.

xv) **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.
TEM Sample Preparation Laboratory: This laboratory provides services for preparing samples of different types for TEM study using instruments like cryoultramicrotome jet polisher, and precision ion polishing system (PIPS) etc.

Thermal Analysis Laboratory: The thermal analysis laboratory is equipped with Differential Scanning Calorimeter (DSC), Thermo-gravimetric and Differential Thermal Analyzer (TG-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 calcination 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 aluminum based nano composites, etc. The TMA is being used to study the sintering behaviour of nano composite materials as well as to determine the thermal expansion coefficients of some newly developed materials.

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 utilised 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.

Thrust Areas:

New Acquisitions:

1. Thermal Analysis Laboratory:
   Nanotrac Particle Analyzer: An instrument to determine the particle size and zeta potential of fine powders.
   Make: Microtrac Inc., 148, Keystone Drive, Montgomeryville, PA 18936, USA.

2. Hall Effect: Low temperature measurement facility for electrical resistivity, magneto-resistance, Hall voltage etc. down to 10 K and the magnetic field up to 1 Tesla have been added recently in the laboratory.

LECTURES BY VISITING EXPERT

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Seminars / Workshops / Conferences / Symposia</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Workshop on “Characterization of Biomaterials”</td>
<td>September 12, 2009</td>
</tr>
<tr>
<td>ii)</td>
<td>Workshop on ‘Characterization of Engineering Materials”</td>
<td>September 13, 2009</td>
</tr>
</tbody>
</table>
CENTRAL LIBRARY

CHAIRMAN : Professor Sadananda Sahu

Librarian
Sutradhar, B. Ph.D., M.Sc., M.Lib.I.Sc., C.C.A.

Deputy Librarian :
Ratnasamy, M. M.L.I.S., P.G.D.C.A.
M.Lib.Sc., M.Com.

Assistant Librarian :
Shankar, Uma M.Lib.I.Sc., M.A.
Mazumdar, Kamal Ph.D., M.Lib.I.Sc., B.Com, CPDA

APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Retirement :
Mr. J. N. Pusty Deputy Librarian
Mr. P. K. Mohapatra Assistant Librarian
Mr. D. K. Das Attendant

The Central Library is one of the biggest technical libraries in Asia and its web site address is http://www.library.iitkgp.ernet.in

PRINT DOCUMENTS ADDED DURING THE YEAR 2009-2010

The Central Library acquired 2121 general books and 1852 text books. It also added 4663 bound volumes of periodicals, 329 Theses, besides reprints and annual reports of other universities.

NEW E-RESOURCES ADDED DURING THE YEAR 2009-2010

i) 600 e- journals from different publishers
ii) 450 print journals from different publishers
iii) 4000 CRC E-books collection copy right years 2004-2010
INTRODUCTION OF NEW LIBRARY SERVICES

i) Online Document Delivery Service of journal’s articles  
ii) Weekly current arrival list of PhD theses submitted by the students of the Institute

CIRCULATION

The books circulation activities are fully automated and serve the users consisting of the faculty, research scholars, students and staff. The books circulation service is kept open for 50 hours a week. On the average, the monthly circulation transactions are about 10000. About 65 copies of documents were obtained through Inter-Library Loan.

DIGITAL LIBRARY

The Digital Library provides access to the following e-resources :

i) **Full-text databases :**

   Access to 10000 full-text journals from the following databases.


ii) **Bibliographic Databases :**

   SciFinder Scholar, ISI Web of Science, MathSciNet, J-Gate Custom Content for Consortia and SCOPUS.

iii) **E-books :**

   Central Library has purchased (onetime) with perpetual access of 4000 CRC Press e-books of major science and technology subjects.

   The digital library also provides access to Video-Courses which contain the lectures delivered by out faculty members. Twice a week the Digital Library organizes User Education Programme so as to train the users to use our digital resources effectively.

iv) **INDEST-AICTE Consortium Databases :**

   The Central Library IIT, Kharagpur is a member of the INDEST Consortium. INDEST membership facilitates the users to access the full text of about 10000 online journals and 5 bibliographic databases.

INSTITUTIONAL DIGITAL REPOSITORY
Central Library, IIT Kharagpur has setup an Institutional Repository using open source software ‘D-Space’. At present the Institutional Repository has 2000 articles; several question papers, books and institute PhD theses.

RENOVATION WORK

Hall no. 3, 4 and 5 at Central Library of IIT Kharagpur have been renovated (civil and electrical work).

NEW EQUIPMENT AND FURNITURE

The following equipment and furniture have been acquired for the users:

i) Two 5 KVA UPS
ii) 10 Computers
iii) One water Cooler
iv) 300 reading chairs

PHYSICAL STOCK VERIFICATION OF LIBRARY BOOKS

Central Library had carried out physical stock verification of Library books during the year 2009-2010. This is the first time stock verification has been carried out since inception.

ORGANIZING INDEST-AICTE WORKSHOP AND 7TH ANNUAL MEET

The “INDEST-AICTE Workshop and Seventh Annual Meet” was held at IIT Kharagpur during January 13-15, 2010 for the benefit of all categories of its member institutions. The theme of the Workshop for this year was “Use and Management of E-Resources”. Prof. D. Acharya, Director of IIT Kharagpur inaugurated the workshop. 200 participants from 18 states including Librarians from IITs, IIMs, IISERs, NITs, National Library and other government engineering and private engineering college attended the 7th annual meet and workshop. Twelve publishers and publishing agencies participated the product exhibition and product presentation during the workshop. There were invited lectures by expert and a panel discussion on “Issue and Challenges in Management of e-resources”.

IIT Kharagpur received the best user award for the following e-resources subscribed by the INDEST-AICTE Consortium:

i) Product : IEEE,
ii) Product : Springer- E-books
iii) Product : ACM Digital Library
IV) Product : Science Direct.

Dr. B. Sutradhar was the coordinator of the Workshop
INVITED LECTURES

i) Dr. B. Sutradhar
Delivered an invited lecture on Community Development in College Libraries in the seminar on Role of College Libraries in Community Development Organized by Central Library Department, Mahishadal Girl’s College during February 05-06, 2010

ii) Dr. B. Sutradhar
Delivered an invited lecture on Management of Electronic Resources at 8th Refresher Course on ICT Application in Academic Library Management, organized by the Department of Library and Information Science, University of Calcutta during February 19 – March 12, 2010

PARTICIPATION IN CONFERENCE / WORKSHOPS

i) Dr. B. Sutradhar
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:

i) Mechanical
ii) Glass Blowing
iii) Carpentry
iv) Electronics
v) Audio Visual

Apart from executing Work Orders from various Departments / Centres / Sections of the Institute, CWISS also undertakes Work Orders from outside on cost basis.

MECHANICAL SECTION

Mechanical Section in CWISS comprises Mechanical fabrication, Mechanical Instrument and Glass Blowing Section.

i) Mechanical Fabrication Section:

It is equipped with various types of machines like 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, and Pantograph Machine, Power Saw, Shearing Machine, Polishing, Press, Arc Welding, Brazing and Soldering, etc.. This year we are purchasing one table mounted CNC Lathe machine, this will enhance 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 as per design.
During the year 2009-2010 the Mechanical Section has performed jobs of about 120 work orders, comprising of –

a) Fabrication of different types of Wave Guides  
b) Fabrication of Die-Punches of different sizes  
c) Fabrication of different sizes tensile, Charpy specimens of different materials  
d) Fabrication of sample holder for wear test  
e) Fabrication of different types of flanges, Studs etc.  
f) Fabrication of Rack, Pinion & Gears  
g) Fabrication of Sample for, XRD, X-ray, SEM, test  
h) Fabrication of different attachment for leaser operation  
i) Fabrication of Micro-channel  
j) Fabrication of Mould with different materials  
k) Fabrication of different types of adopters  
l) Fabrication of servo hinges  
m) Flat Pannel Bio-reactor  
n) Heat sink  
o) Fabrication of fixtures for experiments.

ii) Mechanical Instruments Section:

Different types of precision mechanical instruments are repaired in this section. Some typical examples include different types of stopwatches, gauges, valve regulators, balances, vacuum pumps, gear pumps, husk cutter, water flow meter, gas flow meter, dial indicator, dial gauge, micrometer, gas regulator, pressure gauge, autoclave, viscometer, various types of equipments & machines used in our Hospital, etc. Fabrication of sample holders of SEM & XRD, fabrication of very precision items etc.

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 oxygen and LPG for Departments, like Chemistry, Biotechnology, Chemical, Cryogenic, Mechanical, Material Science, Metallurgical Engineering, Agriculture & Food Engineering, Aquaculture, 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 glassware items are done as per drawing and design of the equipments. This year this Section has finished about 65 Work Orders.

CARPENTRY SECTION

Housed in the workshop complex behind Chemical Engineering and 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 of leather painting,
writing of name Plates, display board & upholstery jobs as students projects. This year this section has manufactured 40 Nos. special reading tables for our library.

This Section also meets the major requirements of furniture of the Institute. During the year 2009-2010, this Section has completed 105 Work Orders of various Departments of the Institute.

Details of some of the Work done during period :

i) Faculty Table --- 17 Nos.
ii) Office Table --- 09 Nos.
iii) Computer Table --- 04 Nos.
iv) Laboratory Table --- 23 Nos.
v) Working Table --- 13 Nos.
vi) Book Shelf --- 03 Nos.
vii) Student’s model of different shape --- 92 Nos.
viii) Display Board --- 20 Nos.
ix) Counter --- 01 No.
x) Box as per design --- 08 Nos.
xii) Computer Table --- 04 Nos.
xii) Name Plate --- 67 Nos.
xv) Partition wall --- 03 Nos.
xv) Wooden Frame --- 11 Nos.
xvi) Big Arena for Kshitij --- 02 Nos.
xviii) Table with safety cover --- 04 Nos.
xviii) Bench --- 02 Nos.
xix) Stool --- 25 Nos.
xx) Keyboard --- 01 No.

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 installed in this section helps users of different departments in fabrication of double sided PCBs.

List of some of the equipments repaired by the section are :

i) GBC Lamination Machine Academic (UG)
ii) Inverter (Microtek 800) Mining Engineering
iii) Spectro Photometer Agricultural & Food Engineering
iv) Electronic Roker Biotechnology [2 Nos.]
v) Ultrasonic machine B. C. Roy Technology Hospital [2 Nos.]
vi) Sonicator Chemistry [5 Nos.]
vii) Electronic steady pipette Biotechnology
viii) COD Digester (Reactor) Civil Engineering
ix) Stabilizer Biotechnology [3 Nos.]
x) Steripette (Tarson) Biotechnology
Audio Visual Section

Audio Visual Cell is primarily involved in providing audio visual support for conducting regular classes at different lecture halls (approximately 150 classes per week). It supports audiovisual facilities with MM 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. AV Cell used to provide support about 5000 regular classes throughout the year in aforesaid classrooms. Besides these the Cell provides AV facilities in all seminars, symposiums, workshops, short term courses and meetings at Gargi Moitrei, S N Bose Auditorium and associated programme at Netaji and Kalidas Auditorium. Senate hall, Committee Room and Board Room. All the TSG activity programme are 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 and International Seminars, Conferences and Workshops and also to JEE and GATE units.


A new 5200 lumen DLP multimedia projector has been procured and installed ceiling mounted at Kalidas auditorium at Vikramshila complex.

5 new multimedia projectors, 8 nos. of cordless collar mics and 6 nos of hand held cordless microphones and 4 PCs have been appended to the inventory of the Cell.
HEAD : Professor Pratim Kumar Chattaraj

FACULTY ASSOCIATED

Pal, Sudebkumar
B.Tech. (Hons.), M.Tech., Ph.D. (IISc Bangalore) (Computer Science and Engineering) Computational geometry, Design and analysis of algorithms

Banerjee, Soumitro

Ghatak, S. K.
Ph.D. (Calcutta University) (Physics & Meteorology) Condensed Matter Physics

Taraphder, A.
M.Sc., Ph.D. (IISc Bangalore) (Physics & Meteorology) Theoretical Condensed Matter Physics

Bharadwaj, Somnath
M.Sc., Ph.D. (IISc Bangalore) (Physics & Meteorology) Theoretical Astrophysics and Cosmology

Kar, Sayan

Khastrig, S. Pratik
M.Sc., Ph.D. (IOP, Bhubaneswar) (Physics & Meteorology) Mathematical Physics and Integral Models

DasGupta, Anirvan
B.Tech., M.Tech., Ph.D. (Kanpur) (Mechanical Engineering) Dynamics, Control and Robotics

Chattaraj, P. K.
M.Sc., Ph.D. (IIT Bombay) (Chemistry) Theoretical Chemistry, Quantum Chaos

Bandyopadhyay, Sanjoy
M.Sc., Ph.D. (IISc Bangalore) (Chemistry) Computational Chemistry, Molecular Modelling

Kumar, Somesh
M.Sc., Ph.D. (IIT Kanpur) (Mathematics) Statistical Decision Theory and Inference, Quantum Computing

Roy, A. R.

Choudhary, R. N. P.
Ph.D. (Edinburgh University) (Physics & Meteorology) Condensed Matter Physics (Expt.)

Staff :

Halder, Ujal
Post Diploma in Computer Application, Diploma in Electrical Engineering (Computer Science and Engineering) Administration, Networking, Web development, Trouble shooting etc.

Project Staff :

Guha Sarkar, Tapamoy
JRF, MRT, 3 years

Panda, Subhasis
CSIR, JRF, 2 years

Nayak, R. R.
DST Fast Track Project, 3 years

Parihari, D.
DST Fast Track Project, 3 years

Ghosh, Tatan
CSIR, JRF, Till March 2010
RESEARCH AND DEVELOPMENT

Brief Descriptions on-going activities:

Research is carried out in CTS on the following areas:

1. 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

2. Dynamics and Control
   i) Nonlinear dynamics: Bifurcation Theory and Chaos
   ii) Control theory
   iii) Vibrations

3. 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

4. Theoretical Condensed Matter Physics
   i) Computational Condensed Matter and Statistical Physics
   ii) Superconductivity

5. 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

ACTIVITIES

Courses and Graduate Programme:

1. CTS is offering new advanced post-graduate courses which are relevant across Departments through involvement of faculty from various Departments. These courses are:
   i) Methods in Molecular Simulations (TS70001)
i) Advanced Dynamics (TS70002)
ii) Wave Propagation in Continuous Media (TS70003)
iii) Advanced Mathematical Techniques (TS70004)
iv) Advanced Quantum Theory (TS70005)
v) Quantum Mechanics and Quantum Computing (TS70006)

2. CTS is also admitting Ph.D. students through sponsored projects and fellowships (CSIR) under Advanced Technology Development Center. Currently three such students are enrolled.

CTS courses taught (2009-2010):

i) Advanced Mathematical Techniques (TS70004) (Autumn)
ii) Quantum Mechanics and Quantum Computing (TS70006) (Autumn)
iii) Advanced Dynamics (TS70002) (Spring)
iv) Methods in Molecular Simulations (TS70001) (Spring)
v) Wave Propagation in Continuous Media (TS70003) (Spring)

ON-GOING RESEARCH PROJECTS

Sponsored Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Measuring the HI power spectrum with the GMRT Dynamics</td>
<td>BRNS, DAE, Mumbai</td>
<td>2007 – 2010</td>
</tr>
</tbody>
</table>

FACILITIES

i) A Computer Lab with 11 Pentiums, 2 Quad core server and a Linux Cluster from CDC, HP color Laserjet duplex network printer, HP Laserjet duplex network printer, HP Colour Deskjet Printers, Scanner, Multimedia Projector

ii) Software (Mathematica, Matlab, Maple, Scilab, IDL etc.)

iii) CTS library

AIMS & OBJECTIVES

i) To generate and nucleate theoretical research
ii) To organize seminars on diverse topics
iii) To organize Conferences/Workshops
iv) To provide research facilities to students/faculties from within and outside IIT Kharagpur
v) To offer postgraduate level elective courses

The Centre for Theoretical Studies (CTS) at the Indian Institute of Technology, Kharagpur (IIT Kharagpur) has been in existence since 1998 and is located in the first floor of the Sahid Bhavan (Old Institute Building) at the Eastern end of the IIT campus. Its primary goal is to generate and nucleate theoretical research on fundamental aspects of basic and engineering sciences. The role of the CTS in the academic framework of IIT Kharagpur is to bring together people of similar interests under a common umbrella. The CTS, apart from acting as a facility for research in theoretical studies in science and engineering, also trains graduate students and provide opportunities to post doctoral workers and researchers from outside IIT Kharagpur. Additionally, the CTS has an active visitors programme of both short and long term visitors. The CTS also organizes seminars, workshops on a regular basis on diverse topics. An important component of CTS workshops and seminars is to motivate young students (both undergraduates from IIT Kharagpur and graduate students from within and outside IIT Kharagpur) to actively pursue theoretical research in front-line areas of science and engineering. Finally, besides promoting research on specialised topics within a given sub field, the CTS hopes to cultivate inter-disciplinary theoretical research as a major goal, tapping the diversity available in the academic population of an Institute like IIT Kharagpur.

VISITORS PROGRAMME

Objective

To provide facilities to faculty members, postdoctoral fellows and students from academic and research institutions in India and abroad to conduct research on theoretical problems in science and engineering in collaboration with faculty members of IIT Kharagpur.

COLLABORATIVE EFFORTS

The Center for Theoretical Studies has very active collaborative research programmes in the broad 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 2009–2010

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Visitor</th>
<th>Institute / University</th>
<th>Associated Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dr. Sanjay K Pandey</td>
<td>Reader, LBS Cloooge, Gonda</td>
<td>Prof. S. Bharadwaj Department of Physics</td>
</tr>
<tr>
<td>2</td>
<td>Dr. Motahar Reza</td>
<td>Assistant Professor, NIST, Berhampur</td>
<td>Prof. S. Chakraborty Mechanical Engineering</td>
</tr>
<tr>
<td>3</td>
<td>Dr. Arindam Chakraborty</td>
<td>Assistant Teacher, JPHS, Kolkata</td>
<td>Prof. P. K. Chattaraj Department of Chemistry</td>
</tr>
<tr>
<td>No.</td>
<td>Name</td>
<td>Position/Institution</td>
<td>Title</td>
</tr>
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<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>4</td>
<td>Dr. Shanta Kumari</td>
<td>Lecturer, BIT Mesra, Ranchi</td>
<td>Are there atoms in a molecule?</td>
</tr>
<tr>
<td>5</td>
<td>Dr. Dilip Kr. Maity</td>
<td>Lecturer, BITS, Pilani</td>
<td>Are there atoms in a molecule?</td>
</tr>
<tr>
<td>6</td>
<td>Dr. Maifuz Ali</td>
<td>Assistant Professor, NIST, Berhampur</td>
<td>Are there atoms in a molecule?</td>
</tr>
<tr>
<td>7</td>
<td>Dr. Biswajit Pandey</td>
<td>Lecturer, Dept. of Physics, Visva-Bharati University</td>
<td>Are there atoms in a molecule?</td>
</tr>
<tr>
<td>8</td>
<td>Dr. Sujit kumar Bose</td>
<td>Prof. [Retd.], SNBNCBS, Kolkata</td>
<td>Are there atoms in a molecule?</td>
</tr>
<tr>
<td>9</td>
<td>Dr. Sk. Saiyad Ali</td>
<td>Lecturer, Dept. of Physics, Jadavpur University</td>
<td>Are there atoms in a molecule?</td>
</tr>
<tr>
<td>10</td>
<td>Dr. Hemant Kr. Srivastava</td>
<td>Project Associate, IICT, Hyderabad</td>
<td>Are there atoms in a molecule?</td>
</tr>
<tr>
<td>11</td>
<td>Dr. Ram N. Mohapatra</td>
<td>Prof., Dept. of Mathematics, Univ. of Central Florida, USA</td>
<td>Are there atoms in a molecule?</td>
</tr>
<tr>
<td>12</td>
<td>Dr. Hemwati Nandan</td>
<td>Post Doc, JMI University, New Delhi</td>
<td>Are there atoms in a molecule?</td>
</tr>
</tbody>
</table>
9. Prof. S.K.Pati  
Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore  
Title: Transport, magnetic and optical Properties of Graphene Nanoribbons  
Date: December 31, 2009

10. Prof. P.Bandyopadhyay  
School of Information Technology, JNU, New Delhi  
Title: Understanding the enzyme important in antibiotic resistance: Computer simulation of b-lactamase enzyme  
Date: December 31, 2009

11. Prof. Sourav Pal, FNA, FASc, FNASc  
National Chemical Laboratory, Pune  
Title: Non-iterative approximation to Coupled perturbed Kohn-Sham method (NIA-CPKS): Development of new approach and its application to study electric response properties  
Date: December 31, 2009

12. Prof. R. N. Mohapatra  
Professor, University of Central Florida, USA  
Title: Frames on a Hilbert C* Module  
Date: February 05, 2010

13. Prof. Naresh Dadhich  
Professor Emeritus, IUCAA, Pune  
Title: Uniform density static fluid sphere in higher dimensions and its universality  
Date: March 26, 2010

14. Prof. V. Balakrishnan  
Professor Emeritus, Department of Physics, IIT Madras  
Title: Recurrences in classical and quantum dynamics  
Date: February 03, 2010

LAURELS & DISTINCTIONS

1. Prof. P. K. Chattaraj  
J. C. Bose National Fellowship, 2010

2. Prof. P. K. Chattaraj  
Elected Member, National Council for the Infosys Prize, 2010

3. Prof. P. K. Chattaraj  
Elected Fellow of the National Academy of Sciences, India and West Bengal Academy of Science & Technology

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. One-day Symposium on Theoretical Sciences, 31st December 2009 December 31, 2009
INFORMATION CELL

PROFESSOR-IN-CHARGE : Professor Balbir Kumar Mathur
INSTITUTE CIVIL WORKS

CHAIRMAN : Professor Nirjhar Dhang

Officer :
Mukherjee, T. K. Superintending Engineer (Civil)
Roy, Subrat Executive Engineer (Civil)

The development programme of the Institute Campus involving infrastructure and new facilities have been taken up in view of the increase in student strength population, faculty strength and staff strength. The programme includes construction of new hostel buildings, extensions of existing students’ hall of residence, classroom complex, residential flats for faculty and staff members etc.

(i) Students Accommodation

The construction for extension of Patel Hall, Nehru Hall, Azad Hall have already been completed, New blocks for Radha Krishnan Hall & Rajendra Prasad Hall are also been completed. On the other hand ongoing works such as, New blocks for Azad Hall, New blocks for Rajendra Prasad Hall, New blocks for Sarojini Naidu Hall / Indira Gandhi Hall / Mother Teresa Hall are in progress. Apart from the above works, 02 (Two) nos. of 2000 capacity Boys’ Hostel have also been started.

(ii) Nalanda Classroom Complex

Block ‘B’ for the above Complex is presently going on. The project is expected to be handed over by July 2011.

(iii) J. C. Ghosh Science Block and P. C. Roy Laboratory Block

Arrangements have been made for the construction of J. C. Ghosh Science Block and P. C. Roy Laboratory Block for Chemistry Department and Rubber Technology Centre. CPWD has been entrusted to execute the job.

(iv) Residential Apartments for Faculty and Staff

The construction works for 63 nos. of A–Type Flats and 81 nos. of B–Type Flats are going on. It is expected that 63 nos. of A–Type flats will be completed by June 2010 and 81 nos. of B–Type Flats will be completed by January 2011. Construction for 64 nos. of 2–BR Type and 80 nos. of 1–BR Type of flats for staff housing are going on.

(v) Project Staff Accommodation

The extension programme for Vikram Sarabhai Residential Complex is going on. It is expected that 117 nos. of quarters will be ready for occupancy by March 2011.
(vi) Guest House

We have already completed the 124 room guest house and is presently under use.

The Master Plan for the campus has already been approved. Several infrastructure development programmes have been undertaken in view of the increasing students’ population in the campus. A few of them are students’ amenity centre, Laboratory Complex, Roads and Drains, etc.
INSTITUTE ELECTRICAL WORKS

PROFESSOR-IN-CHARGE : Professor Debapriya Das

Officer :

Ghosh, Sabyasachi Executive Engineer (Electrical)
Kumar, Mahesh Executive Engineer (Electrical)
Chakrabarty, Dipak Kumar Executive Engineer (Electrical)

Brief description of major activities and on going projects

The principal endeavour of this section during last one year was to ensure and provide uninterrupted power supply with minimum break down time in places for Academic activities and other areas. In order to achieve the same following measures were adopted.

i) Installation of Fire Alarm System in Central Library

ii) Augmentation and replacement of the remaining distribution networks with MCCB controlled panels and adequate size of power cables

iii) Renovation of old class rooms, laboratories and offices

iv) Replacement of conventional luminaries with energy saving luminaries in most of the academic areas mainly in Central Library etc.

v) To keep pace with faster development of the academic curricular, many of the new machines, instruments were installed in the places like Central Research Facility, Steel Technology Centre and different Departments. Redistribution of wiring was done in those places for proper load balancing.
INSTITUTE WATER WORKS

PROFESSOR-IN-CHARGE : Professor Ashok Kumar Gupta

Officer :

Biswas, Shyamal Kumar Engineer

To meet the additional water demand from the increased student and faculty strength and also to maintain the existing water supply system, Water Works Section of the Institute has taken up several new water related works. They are in different stages of progress as listed below :

Works completed :

The following works have been completed :

i) Laying of 250 mm dia main water pipeline between Underground Pump House and Hall area

ii) Construction of Iron removal filter for new deep tubewell near BC Roy Technology Hospital

iii) Laying of pipeline between deep tubewells of pumphouse no. 3 & 1 at Anicut Pumphouse

iv) Providing water connection for newly constructed blocks at RP & RK Hall of Residences

v) Construction of two deep tubewells near RP Hall & Tank No. 3

vi) Diversion of water pipelines from the construction site of VSRC (SRIC Quarters) at Dandakaranya area

vii) Laying 200 mm dia water main between Radar Tank and Dandakaryana Tank

viii) Renovation of water pipelines and fittings at Gokhale Hall of Residence.

On-going works :

The following new projects are being implemented :

i) Providing overhead water tanks & replacement of old pipelines at Dandakaranya Area (Part A & Part B)

Works in the pipeline :

i) New Water Supply Project for IIT Kharagpur.
KALPANA CHAWLA SPACE TECHNOLOGY CELL

CHAIRMAN: Professor Somnath Sengupta

FACULTY

Professor:

Sengupta, Somnath Ph.D., Image & Video Processing
Sarkar, B. K. Ph.D., RF & Microwave Engineering
Das, S. K. Ph.D., Control System
Sen, S. Ph.D., MEMS
Patra, Amit Ph.D., Power System & VLSI Design
Sanyal, S. Ph.D., RF & Microwave Engineering
Chakraborti, S. Ph.D., Communication
Bandyopadhyay, S. S. Ph.D., Cryogenic Engineering
Bandyopadhyay, K. Ph.D., Satellite Communication
Manna, I. Ph.D., Material
Ray, G. Ph.D., Control System
Sengupta, I. Ph.D., Mobile Communication, VLSI
Chowdhury, D. R. Ph.D., Audio Encompression
Das, P. K. Ph.D., Nano Fluid
Banerjee, S. Ph.D., VLSI based embedded system design for signal / image processing, Biomedical Instrumentation
Chaki, T. K. Ph.D., Rubber

Associate Professor:

Saha, G. Ph.D., Communication
Chakrabarty, C. Ph.D., Control System
Sant, S. B. Ph.D., Material
Datta Majumdar, J. Ph.D., Nano fluid based
Bhattacharya, T. K. Ph.D., RF MEMS

Assistant Professor:

Sinha, M. Ph.D., Aerospace Engineering
Bhattacharya, A. Ph.D., RF & Microwave Engineering
Chakraborty, P. K. Ph.D., Solid-State Science and Technology
Mitra, A. Ph.D., Nutraceuticals & herb based medicine / Diabetology, Drug encapsulation, Clinical Trials
Das, Soumen Ph.D., MEMS & Microsystems
Nandi, T. K. Ph.D., Cryogenic Engineering

Emeritus Professor:

Naryanan, K. G. Ph.D., Microwave Engineering
Chair Professor:

**Sarkar, B. K.** Ph.D., RF & Microwave Engineering

Visiting / Adjunct Faculty:

Bose, A. M.E., Mechanical Engineering  
Dasgupta, S. Ph.D., Control System  
Das, B. B. Ph.D., Control System

Officer:

Ghosh, Saswati Ph.D., EMI / EMC, RF Microwave Circuit & Antenna  
Guchhait, P. K. M.Tech., Nano fluid

**FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION**

Faculty Appointed as Emeritus Professor:

Dr. K. G. Narayanan Professor

Faculty Retirement:

Prof. S. L. Maskara Professor  
Prof. S. K. Lahiri Professor  
Prof. T. S. Lamba Professor

**RESEARCH AND DEVELOPMENT**

**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 17th 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:

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
7. On An Algorithm for Boundary Estimation of Commonly Occurring 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
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 Suppression 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
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
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
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, 19th 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

i) Multimedia and Video Processing:

An FPGA-based state-of-the-art video codec is being developed. The system under development finds its usage in Digital Video Broadcasting (DVB) system and performs real time encoding of colour videos frames size (352×288 pixels) at 30 frames/sec.

ii) Radiation patterns of antennas on satellite:

Radiation due antennas in free space can be readily computed and measured. However, when the antenna platform, that is the satellite structure need to be accounted for, then it becomes impractical to measured even in the most modern Anechoic Chambers of the world. Also, numerical techniques fail to predict the effect of the large structure on antenna radiation due to the limitations of computer memory and speed, even in today’s world. Hence, analytical like STD needs to be developed for this purpose. This has been the field of study for the present investigator.

iii) Monopulse Comparator:

Design of highly compact comparator for monopulse radar application using reduced height Ku-band waveguided.

iv) DRA:

Design, Simulation and fabrication of CPW feed DRA to the narrow band application.

v) IRA (Impulse Radiating Antenna):

Impulse Radiating Antenna is an UWB, directive and non-dispersive antenna. It was modeled and simulated using CST microwave studio and various parameters like Reflection Coefficient, VSWR, Gain, directivity and Radiation patterns were studied.
A detailed study and simulations of various models for use of this antenna for high power applications was carried out.

vi) **MPCA**:

Miniaturized Printed Circuit Antenna Design, Simulation and fabrication, Testing of Antenna for different Applications like Mobile, UMTS etc.

vii) **RFID**:


viii) **MTMs**:

Gain Enhancement of electrically small antennas using Metamaterials:- Design and Simulation of an electrically small antenna surrounded by Metamaterial shell/sphere

ix) **MOM**:

Method of Moment (MOM) analysis, design, fabrication and testing of various types of waveguide slot excited Dielectric resonator Antennas (DRAs)

x) **Electromagnetic Modelling of high frequency electronic systems to estimate EMC**:

Electromagnetic interference is becoming a crucial issue in the design of modern high frequency electronic systems. In the conventional design methodology, EMC issues in the design of modern high frequency electronic systems. In the conventional design methodology, EMC issues are addressed only after a prototype is built. However, this process has a potentially significant impact on the cost and time – to – market of the products. This needs to develop an accurate and efficient electromagnetic analysis and modeling to analyze the performance of high frequency electronic circuits for verifying the design against all sorts of electromagnetic interference before fabrication. This has been taken up as the present work. Different conducting and dielectric bodies have been modeled using Method of Moments and the radiation and reception characteristic have been studied.

xi) **GPS**:

Global positioning system (GPS), Adaptive Equalizer, Adaptive Array Antenna (Smart Antenna), Digital Signal Processing, Microwave Communication, Image processing & Numerical Techniques in Electromagnetic.

xii) **Antenna Design**:

Project title: Reduction of Mutual Coupling between microstrip antennas.
Use Software: HFSS, CST

xiii) **Impulse Radiating Antenna (IRA)**:
CST MS Software is being used to design and simulate an Ultra wideband Impulse Radiating Antenna (IRA), a TEM horn antenna (sensor), a 50 to 100 ohm impedance transformer and a splitter (50 ohm to 100 ohm coaxial cable) for differential feed to a full (4 arm) IRA.

xiv) **Site-Specific Propagation Channel Modeling:**

Our goal is to develop deterministic propagation channel model for micro and Pico cell scenario. Now-a-days, industry are using statistical channel modeling to characterize the wireless channel but following the reduction in call size, accurate characterization of channel becomes of vital significance. This leads to further investigation into the model which accurate, deterministic and amenable to industry requirement.

 xv) **Ka Band Propagation Channel Modelling for Satellite Communication System:**

Communication systems, vapour, fog, oxygen, rain and several other gases which make up the air, cause propagation attenuation. Among these different atmospheric constituents, rain induced attenuation is the most severe, except for the degradation that occur near 22 GHz or 60 GHz die to vapour or oxygen. In particular, if a high frequency band of 10GHz and above is used the propagation attenuation due to rainfall is most dominant to overcome a signal degradation even on emust either avoid it or compensate for it.

xvi) **Satellite Navigation:**

Study and implementation of CDMA codes Binary offset carrier (BOC) modulation techniques and code tracking methods for Indian Regional Navigation Satellite Systems (IRNSS).

xvii) **Development of thiol terminated and PU polymers based nanocomposites adhesive for cryogenic propellant tank insulation applications:**

The research work relates to the development of formulation of adhesive and coating nanocompounds consisting of thiol terminated polymers and / or polyurethane polymers, filled with nanostructured materials and room temperature curators. These coating have barrier properties who find uses over cryogenic propellant tank multilayer layer – insulation.

b) **Thrust Areas:**

i) Liquid Combustion, Propulsion and Cryogenics  
ii) Space Communications and EMI/EMC  
iii) Micromachine Sensors  
iv) Control, Navigation and Guidance  
v) Embedded Systems and IP-Cores  
vi) Life Support Engineering  
vii) Smart Materials & Exotic Materials  
viii) Power Electronics
ix) Space Education
x) Electronics Devices
xi) Cryogenics

c) New Acquisitions:

i) CST Software-Microwave studio, version-5
ii) IE3D – version – 9 by Zeland Software Inc.
iii) WIPL-D
iv) HFSS
v) VCO-Model no – ZOS-1025, Freq. Range – 685 -1025 MHz
vi) LNA -
   b) Model – ZHL – 0812 HLN, Freq. Range – 800 -1200 MHz
   c) Model – ZHL – 2HAD, Freq. Range – 50-1000 MHz
   d) Model – ZFL – 1000VH2, Freq. Range- 10 -1000 MHz
vii) Filters -
   a) LOW PASS FILTER:- Model.no- BLP-550, Freq. Range – DC-520
   b) HIGH PASS FILTER :- Model no- NHP-1000, Freq. Range-DC – 550
viii) Mixers -
   a) Model. No- ZLW – 2, Freq. Range – 685-1025MHz
   b) Model.No. – ZEM-4300, Freq. Range- 300-4300MHz

ON-GOING RESEARCH PROJECTS

Sponsored Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsoring(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Antenna Patterns on Satellite in Orbit Model</td>
<td>ISRO-IIT Kharagpur Cell</td>
</tr>
<tr>
<td>3.</td>
<td>Design of an Optimal Control Strategy for gSLV MK3</td>
<td>ISRO-IIT Kharagpur Cell</td>
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<tr>
<td>4.</td>
<td>Attitude Control of Launch Vechiles</td>
<td>ISRO-IIT Kharagpur Cell</td>
</tr>
<tr>
<td>5.</td>
<td>Development of Speaker Recognition Software for Telephone Speech</td>
<td>ISRO-IIT Kharagpur Cell</td>
</tr>
<tr>
<td>6.</td>
<td>Development &amp; Characterization of Copper based Brazing Alloy by Rapid Solidification and Mechanical Alloying</td>
<td>ISRO-IIT Kharagpur Cell</td>
</tr>
<tr>
<td>8.</td>
<td>Design and Fabrication of High Sensitivity Micromachined Silicon Tunneling Accelerometer with Micro-g Resolution</td>
<td>ISRO-IIT Kharagpur Cell</td>
</tr>
<tr>
<td>10.</td>
<td>Design and Development of CMOS based 8 Bit 250 to 500 MSPS Analog to Digital and Digital to Analog Converter</td>
<td>ISRO-IIT Kharagpur Cell</td>
</tr>
<tr>
<td>11.</td>
<td>Development of RF MEMS Capacitive Shunt Switch in Application as Phase Shifters for Satellite Communication</td>
<td>ISRO-IIT Kharagpur Cell</td>
</tr>
</tbody>
</table>
12. FPGA-based design and development of H-264 codec for Cryogenic Rocket Engine Turbopump
14. Feasibility Study of Microwave Imaging for Material Resource Exploitation in Planetary Missions
15. Development of Advanced Polymeric Materials for Improved Electrical / ESD properties Using Nano Additives for Space Application
16. Ka Band Propagation Experiments Over Indian Tropical Region For Improvement of Ka Band Satellite Communication
18. Study of CDMA codes for satellite navigation
19. Error resilient Scheme for Satellite TV System
20. Studies on Fade Mitigation Control for Microwave Satellite Signal Propagation
21. Handset Normalization and Reduction of Noise and Distortion for Voice Authentication
22. Analysis and Development of Conceptual Design Methodologies for Air Collection and Enrichment System of Air Breathing Propulsion-Phase II
23. Development of a MEMS based Assay for bio-medical diagnostics
24. Silicon Carbide as high temperature MEMS and MOSFET devices
25. Nano-fluid Based Coolant and Combustion Fuel System
26. Design of radiation hardened data converters
27. Study on Improvement of adhesion of EPDM based nanocomposites in Solid Rocket Motor Thermal Insulation applications
29. Interplanetary Satellite Orbit Determination Using Ground Based Observations
30. Synthesis of satellite footprint patterns from planar array antennas by combination of particle Swarm Optimization and Fast Fourier transform
31. Analysis of Different Conducting and Dielectric Structure as EMI Sensors
32. Test bed for Marine Vessel Location System
33. Design, Simulation and Development of MM-Wave six port receiver
34. Multiple Access array antenna system at S band using digital beam forming techniques
35. Design and Development of Application tool for InSAR to Determine Ground Surface Movement
36. Design & Development of High-Speed Miniaturized RF MEMS Switched Capacitor

Consultancy Projects :

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Preparation of Vision/theme and feasibility report</td>
<td>Tirupati Assets Pvt. Ltd., Kolkata</td>
</tr>
<tr>
<td>2.</td>
<td>Development of Educational Complex</td>
<td>Tirupati Assets Pvt. Ltd., Kolkata</td>
</tr>
<tr>
<td>3.</td>
<td>RF Fundamentals for Wireless Network</td>
<td>WMNet Serv Ltd., Bangalore</td>
</tr>
<tr>
<td>4.</td>
<td>Mast Clamp current probe antenna</td>
<td>Naval EMC Centre, Mumbai</td>
</tr>
</tbody>
</table>

LECTURE BY VISITING EXPERT

1. Dr. P. S. Goel Ministry of Earth Science 1st Kalpana Chawla Memorial Lecture on “Space – The Challenging Frontier” on August 22, 2010

INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Somnath Sengupta Image Compression and JPEG-2000 at Integrated Test Range, Chandipur, DRDO on August 20, 2009
2. Prof. Somnath Sengupta Video Coding: Past, Present and Future at LNMIIT, Jaipur
3. Prof. Somnath Sengupta Human Detection for Video Surveillance at Jadavpur University, Kolkata
4. Prof. Ajay Chakrabarty EMI/EMC at Space Application Centre-ISRO, Ahmedabad, August 18-20, 2009
5. Prof. Ajay Chakrabarty EMI/EMC at JNU, New Delhi, November 5-6, 2009
6. Prof. Ajay Chakrabarty Radar Signal Processing at Behrampur Engineering College, Behrampur, Orissa
7. Prof. Ajay Chakrabarty Electromagnetic Scattering at RCI, Hyderabad
8. Prof. Ajay Chakrabarty Introduction to Radar Systems at C.V. Raman College of Engineering, Bhubaneswar, Orissa
9. Prof. Ajay Chakrabarty Antenna and Measurement at Puroshattam Engineering College, Rourkela, Orissa
10. Prof. Amit Patra Power Management Circuits at National Semiconductor Corporation, Santa Clara, USA
11. Prof. Amit Patra Power Management Circuits at Intel Corporation, Portland, Oregon, USA
12. Prof. Amit Patra Online Testing of Digital VLSI Circuits at Intel Corporation, Portland, Oregon, USA
13. Prof. I. Sengupta Delivered Keynote Talk at the ICCSN 2010 Conference, Singapore
15. Prof. B. K. Sarkar  Electromagnetic Scattering at RCI, Hyderabad
16. Prof. B. K. Sarkar  Introduction to Radar Systems at C.V.Raman College of Engineering, Bhubaneshwar, Orissa
17. Prof. B. K. Sarkar  Antenna and Measurement at Puroshattam Engineering College, Rourkela, Orissa
18. Dr. Soumen Das  BioMEMS at NEHU, Shillong, March 25-27
19. Dr. Soumen Das  Mobile diagnostics: A MEMS perspective at Texus Instruments, Bangalore, October 26-27
20. Dr. Soumen Das  R&D activities on MEMS at IITKGP at IIT Bombay, March 17
21. Dr. Soumen Das  Introduction to MEMS at IIT Kharagpur, July 3-17
22. Dr. A. Mitra  Role of computer applications in life science experiments at Rayagada, Orissa MIT
23. Dr. A. Mitra  Technology in health care: Prospects and Challenges at Sri Aurobindo Society, Kolkata

THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Mainak Mukhopadhyay</td>
<td>Some Studies of Global Postioning System Anti-Jamming Technique for GPS and Smart Antennas</td>
</tr>
<tr>
<td>2</td>
<td>Debendra Panda</td>
<td>Analysis of longitudinal Rectangular Waveguide Power Dividers / Combiners Using Multicavity Modeling Technique</td>
</tr>
<tr>
<td>3</td>
<td>Y. K. Singh</td>
<td>Design, Simulation and Fabrication of Microstrip and Waveguide Filters.</td>
</tr>
<tr>
<td>4</td>
<td>Moutushi Mondal</td>
<td>Analysis of waveguide slot array antenna for wireless communication</td>
</tr>
<tr>
<td>5</td>
<td>Susmita Ghosh</td>
<td></td>
</tr>
</tbody>
</table>

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ATTENDED
2. Prof. Swapna Banerjee  ZOPP Workshop, organized by MCIT at IISc Bangalore, February 18-19, 2010

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ATTENDED

1. “Efficient Systems for Microwave Transmission and Radiation” January 18-23, 2010
NATIONAL CADET CORPS (NCC)

COMMANDING OFFICER : Wg. Cdr. V. K. Gupta

AIMS & OBJECTIVES

i) To develop qualities of character, courage, comradeship, discipline, leadership, secular outlook, spirit of adventure & sportsmanship and the ideas of selfless service among the youth to make them useful citizens.

ii) To create a human resource of organized, trained and motivated youth, to provide leadership in all walks of life including the Armed Forces and be always available for the service of the nation.

iii) To create suitable environment to motivate the youth to take up a career in the Armed Forces.

MAJOR ACTIVITIES

During the training year 2009-2010, 203 cadets of 1st year and 2nd year of engineering were trained as NCC cadets. One Service Officer, one Associated NCC Officer and 11 service personnel were involved in imparting NCC training to the IIT students. Following social service and social awareness were also undertaken by the NCC cadets.

SOCIAL SERVICE ACTIVITIES

<table>
<thead>
<tr>
<th>Activities</th>
<th>Date</th>
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<tbody>
<tr>
<td>Sadbhavana Run</td>
<td>August 22, 2009</td>
</tr>
<tr>
<td>Blood Donation Camp at 25 Bn NCC</td>
<td>November 15, 2009</td>
</tr>
<tr>
<td>Donated dry rations &amp; fresh rations to the Seema Center (Charitable Organisation)</td>
<td>December 07, 2009</td>
</tr>
</tbody>
</table>

SOCIAL AWARENESS ACTIVITIES

<table>
<thead>
<tr>
<th>Activities</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti Dowry &amp; Anti Female Foeticide Pledge</td>
<td>August 08, 2009</td>
</tr>
<tr>
<td>Cancer Awareness Rally</td>
<td>November 07, 2009</td>
</tr>
<tr>
<td>Lecture on Anti Drug</td>
<td>November 14, 2009</td>
</tr>
<tr>
<td>National Anti Leprosy Awareness Rally</td>
<td>January 30, 2010</td>
</tr>
</tbody>
</table>
LECTURES BY VISITING EXPERTS

Cadets got a chance to visit Air Force Station Kalaikunda, have an exposure with all military equipments and the Air Force environments. Experts were invited from Air Force Station Kalaikunda to deliver lectures to the cadets regarding Fire Extinguisher & First Aid.

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. A Combined Annual Training Camp was conducted for all 1st year NCC cadets at behind Seema Center IIT Campus, Kharagpur, organized by the unit. The cadets were made to experience the military field conditions. Drill practice, Physical training, Games, Debates, Quiz competition and cultural programs kept the cadets glued with thrill and excitement. Prof. D Acharya, Director, IIT Kharagpur and Group Commander of NCC GP HQ Kharagpur also paid visit to the camp.

28th November – 7th December 2009
NATIONAL SERVICE SCHEME (NSS)

HEAD : Professor P. K. Bhowmick

STUDENTS ACTIVITIES RELATED TO NSS

National Service Scheme (NSS) Unit of the Institute is functioning with registered 639 undergraduate students of 1st and 2nd year level. It took up several service oriented activities in the fringe villages of IIT Kharagpur campus under the direct guidance and supervision of eight faculty Program Officers and five faculty volunteers besides the Head, NSS and the coordinator, EAA. The important activities performed during the session include, providing basic education (3Rs) to the illiterate children working in the shops, stalls, canteens etc., in the locality, special coaching to about 83 school going and dropouts; developing supplementary education material for class IX-XII NCERT books, plantation and up keeping of more than 550 forest plants under environment protection programme; preparation and demonstration of scientific and technological models with Nehru S & T Museum at the Institute; conducting health and nutrition survey in the villages, organizing health awareness campaigning programme, etc. One of the free coaching centre run by NSS volunteers in a nearby slum comprising of 22 children arranged one competition of curricular and co-curricular activities on last working day of this semester. Prizes and sweets were distributed to all at the end of the function.

The annual camp held at village Ghagra Paschim Pathri was very effective on both counts. On one hand, it helped the budding engineers to face real India and realize their duties and responsibilities towards the country. It also helped the local village population as students volunteers toiled hard to make some difference in the village life. They cleaned roads, filled up pot-holes, sanitized wells, drains; distributed winter clothes collected from IIT campus and made them aware of social evils through procession, short play, song and recitation. It was great to see the students befriending local youth, working with them on these issues and playing a friendly cricket match on the final day. The volunteers practiced austerity and collected Rs. 5000 among themselves for renovating the toilet of the village school.

A large number of NSS volunteer besides their NSS work are supporting several initiatives where students not connected with NSS are coming together and are trying to address certain needs of the underprivileged. These group are Vigyan-Vivek, Goonj, Gopali Youth Welfare Society, CRY, Engineering without Borders etc. to name a few.

An initiative is made to work in tandem with local administration in implementing Government welfare schemes. Towards this, S.D.O. Kharagpur addressed NSS Program Officers and NSS volunteers at S.N. Bose Auditorium on March 20, 2010. S.D.O. requested NSS IIT Kharagpur to work as facilitator in various programmes. Subsequently, NSS volunteers interacted with S.D.O. Kharagpur office and one Deputy Magistrate has been appointed as point of contact.

A series of lecture-demonstration on “AIDS & We” was conducted by Ms. Vanesse, a student from Brazil under the student exchange programme of AIESEC. It total 242 NSS volunteers of the Institute and 96 students of Midnapore Homoeopathic Medical College attended the lectures.
RAJBHASHA VIBHAG

CHAIRMAN :       Professor Parmeshwary Dayal Srivastava

Officer :

Rawat, Rajeev Kumar (Dr.)   Hindi Officer

It is the pride of Rajbhasha Vibhag that it is situated in the historical heritage building known as “Hijli Saheed Bhavan” of Indian Institute of Technology Kharagpur. The building is the eyewitness of freedom struggle and the sacrifice of many innocent countrymen.

The aim to set up an independent Rajbhasha Vibhag is to make efforts to implement the Rajbhasha policies formulated by Government and enhance the progressive use of Hindi in official correspondence of the institute.

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 Teacher, Hindi Teaching Scheme and 97 employees have been trained so far 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 2009-2010, the following events took place :

i) Prof. H. C. Verma, an eminent professor of Physics in IIT Kanpur was invited for a Hindi seminar. He delivered a lecture in Hindi on the life and works of famous scientists of the world. He also gave a Institute lecture for the benefit of the Institute
students, employees as well as students of nearby schools and elaborated “How were the Elements Formed”.

ii) During January 12-14, 2010, a Hindi workshop was organized for the employees. In this, Dr. Rajeev Kumar Rawat, Hindi officer briefed the employees about the techniques for doing their day to day official work in Hindi.

iii) Rajbhasha Vibhag organized a National Seminar on “Technical and Scientific writing in Hindi” during February 17-18, 2010. In which eminent speakers Shri Ishwar Chandra Mishra, Translation / Training Officer, CTB Bengaluru, Dr. P. S. R. Murty, Senior Hindi Officer, NAL, Bengaluru were invited for lectures. During this national seminar several faculty and students of our Institute too, presented their technical / research papers and delivered lectures in Hindi.

iv) On March 24, 2010 a Seminar on the topic "The Role and Duties of Officers in attaining the Rajbhasha Programme Targets : Practical Suggestion for Implementation" was organized for the Group 'A' Officers and Section in-Charges, in which, eminent speaker, Shri. J. N. Singh, Hindi Officer, Ministry of Defence, gave practical tips to attain the annual Rajbhasha targets.

v) Hindi Officer Dr. Rajeev Kumar Rawat participated in the national Rajbhasha seminar organized by MHRD in Pondichery University on November 05, 2009.

Celebration of Hindi Divas :

During the month of September, Rajbhasha Vibhag has organized "Hindi Saptah" during September 08-14, 2009. 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 cash 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 Software like i-hop, 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.

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 750 books of different writers on literature, fiction, poetry, prose, play and various subjects of translation and language.

**Bilingual Website:**

The Rajbhasha Vibhag has made its website bilingual. Useful information links are available on Vibhag Website regarding training programmes, incentives schemes, different tools etc.

**COMMITTEES**

**Official Language Implementation Committee and Progress Measurement Committee:**

The Institute has constituted two committees named as Official Language Implementation Committee (OLIC) and Progressive Measurement Committee (PMC) for the implementation of Rajbhasha Policies and monitors the progressive use of Hindi in the Institute in day-to-day work. A combined meeting of the OLIC and PMC is held quarterly and is chaired by the Director. The Progressive Measurement Committee (PMC) inspects each department and monitors the progressive use of Hindi in the Department and submits the report to Director.

**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 28 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. D. Acharya has nominated Prof. P.D. Srivastava, 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 August 24, 2009 and January 29, 2010. 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.
Research plays an integral role in Indian Institute of Technology Kharagpur’s vision of a technological university and is a critical contributor to graduate and undergraduate education programs. The discovery and application of new scientific concepts and technologies are core goals for faculty, staff, and students. As one of the nation’s top technological institute, IIT Kharagpur is improving lives through the discovery and dissemination of knowledge addressing significant interdisciplinary research challenges. IIT Kharagpur’s research programs reach across the campus and beyond, linking together 19 departments, 15 academic centers and a large number of advanced R&D laboratories, stimulating the integration of inquiry, new knowledge, and education.

IIT Kharagpur works closely with government research agencies and the policy-makers who initiate and guide research initiatives at the national level. This has enabled IIT Kharagpur to participate in a variety of cutting-edge scientific and technological areas, including computation and information technology, life sciences and biotechnology, energy and the environment, nanotechnology etc. Private funding is also central to IIT Kharagpur’s research programs, and many large corporations use the broad expertise of the faculty in science, engineering, business and policy.

During the year 2009-2010, the Institute received from the Government, private and international funding agencies / enterprises 194 research projects for a total value of Rs. 141.92 crores (31.56 million USD) and 129 consultancy projects worth Rs. 10.12 crores (2.25 million USD) aggregating a total of 323 projects for Rs.152.04 crores (31.81 million USD).

Over the years IIT Kharagpur has gained special expertise in advanced chip design and CAD for VLSI and MEMS, software development, planning, management and ERP working closely with all major national and international organizations. Research has also been initiated on specialized areas such as MEMS based components for RF application and an advanced facility for research in reliability engineering has been established. The large gamut of specialized software technologies include power management software, telemedicine software (currently used in several remote sites in several states), communication empowerment software for physically challenged, software for medical measurements and tools for security and biometric authentication. Other important software developed include a specialized bond-graph based technology, simulators for biomechanics and a fluid mechanics and ocean dynamics based software for storm surge measurements. Two mission projects for development of Virtual Labs and pedagogy and e-learning involving premier Institutes of the Nation have been initiated.

In the areas of Life Sciences, the Institute has an artificial heart development program that is undergoing phase II trials. A unique male contraceptive, RISUG is undergoing third phase of trials. Interdisciplinary research is being carried out in areas of, non-invasive measurements, advanced image processing, medical implants, protein structure analysis and drug design, orthopedic biomechanics. Green technology routes have produced unique protocols for insect
resistant cotton, jute, bio-hydrogen, separation and purification of anti-carcinogenic components from green tea leaves, etc. Research in biotechnology has resulted in a number of high quality enzymatic processes for a variety of food technologies. Research work is being carried out on high pressure processing on high value perishable commodities, development of novel nano-biocomposite osteogenic matrices for cell based bone tissue engineering, production of pure variety disease free potato seeds through in-vitro culture technique, Aloe Vera processing and bio depolymerisation of low grade lignite.

The major research initiatives in nanotechnology and nano-materials include work on nanocomposites, nano-wires, semiconductors and metal alloys. A major research initiative in the development of MBE cluster tool nano-semiconductor infrastructure and nano-devices has been initiated. The area of micro-fluidics and bio-nano-mems has developed new techniques for DNA hybridization, micro-scale cooling for electronic components and digital microfluidics.

The energy research program at IIT Kharagpur has got a major boost during the last year with the formal initiation of P. K. Sinha Centre for Bio-energy. A major research activity on hydrogen production through biological routes has been started. The other works include fuel cell based systems and energy materials, production of renewable hydrogen combined with CO₂ capture etc. The development of a solar powered aircraft as a major student-led funded research project has underscored the active participation of the students in niche areas.

An MOU for setting up of a Centre for Railway Research has been signed with Ministry of Railways, Government of India. A major grant has been received from the Ministry of Communications & Information Technology, Government of India for development of MBE cluster tool based epitaxial nano-semiconductor infrastructure facility. Two other major projects have also been received from the Government of India for seismic hazard assessment and evaluation of vulnerability for the city of Kolkata, and National Programme on technology enhanced learning.

Industry–academia partnership at IIT Kharagpur is thriving with industries forming partnerships in joint research projects, acquiring technologies developed in the institute and seeking consultancy supports from the Institute. Some of the major research initiatives in recent years include Steel Technology Center, major R&D Centers in Energy Sector in collaboration with DVC, Tea Engineering Research Center, Vodafone-ESSAR-IIT Kharagpur Centre of Excellence in Telecommunications, National Program in Marine Hydrodynamics, Centre of Excellence in Information Assurance, National facilities for EPMA, General Motors Collaborative Research Laboratory in Electronics Controls and Software (ECS) and a Regional Center for Rural Technology Action Group (RUTAG) are some of the recent such successful initiatives.

IIT Kharagpur has a long tradition of protecting inventions and has received numerous patents (109 in number) over the years. The Intellectual Property Rights and Industrial Relations (IPR & IR) Cell under SRIC is responsible for the licensing and the transfer of technologies developed by faculty members, students and other researchers at IIT Kharagpur to the commercial sector. Total 41 numbers of technology have been transferred. The Entrepreneur Cell under SRIC supports a variety of incubation programmes funded by the Government.
SCIENCE & TECHNOLOGY ENTREPRENEURS’ PARK

MANAGING DIRECTOR: Professor Dhrubes Biswas

MAJOR ACTIVITIES

i) School of Engineering Entrepreneurship (SoEE) establishment decision
   The Senate has passed the functioning of SoEE and classes at STEP premise. It has been decided that there will be construction of faculty rooms, classrooms and the innovation lab at STEP for SoEE.

ii) High end TBI lab with VLSI based equipments has been established to facilitate the entrepreneurs under TBI/STEP incubation.

iii) High-end Video conferencing facility class room established for International Projects.

iv) The new corporate looks has been created at STEP premise in line with the number of visitors from different parts of the country and world. The good gardening and landscaping has also been done in consonance with the other premises of IIT Kharagpur. The area is now at par with other incubation centers of the country.

v) The development infrastructural facilities have been made in accordance with the requirement of the office space as well as other important necessities.
   (a) Remodeling of the STEP office seating space.
   (b) Creation of additional seating capacity (to accommodate Entrepreneurs including Students, Faculties & General Public).
   (c) Purchase of PCs for improvement of accounting & computing infrastructure.
   (d) Maintenance of existing PCs with new software tools to facilitate finance & accounts.
   (e) The Guest House of STEP has been renovated to provide three star facilities.

vi) Appointment of experienced professionals for reorganization and proper working of the new projects of STEP.

RESEARCH AND DEVELOPMENT, IF ANY

i) Thrust Areas of Research
   (a) Education – Enterprise business models for university based co-creation
   (b) Health problem mitigation with technology interventions
   (c) Technology interventions of Growth Ventures

ii) Brief descriptions of on-going entrepreneurial activities at STEP
   (a) Total No. of companies : 36
   (b) STEP IIT Kharagpur Campus : 25
   (c) STEP Gopali Campus : 11
<table>
<thead>
<tr>
<th>#</th>
<th>Companies of STEP / TBI</th>
<th>Major Entrepreneurial Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>P2 Power solutions</td>
<td>Work in the domain of Power Quality enhancement at distribution level</td>
</tr>
<tr>
<td>2.</td>
<td>Data Resolve Technologies Pvt. Ltd.</td>
<td>All the products and services of company revolve around the issue of securing different forms of electronic data which is potentially under theft</td>
</tr>
<tr>
<td>3.</td>
<td>Electro soft consultants</td>
<td>Involved in several sponsored and consultancy projects dedicated towards empowerment of physically challenged people</td>
</tr>
<tr>
<td>4.</td>
<td>Centre for Advanced Communication</td>
<td>Interactive Software Integrated Learning System (ISILS) is the heart beat, nerve centre, brain, driving force of our overall system</td>
</tr>
<tr>
<td>5.</td>
<td>Sankalp Semiconductor Pvt. Ltd.</td>
<td>Analog Mixed Signal services and solutions specializing in end-to-end solutions for IOs, analog and mixed signal chip design / layout</td>
</tr>
<tr>
<td>7.</td>
<td>Intellisys</td>
<td>Video Conferencing Systems, Live collaboration software, Embedded Technologies</td>
</tr>
<tr>
<td>8.</td>
<td>High tech consultants</td>
<td>Modeling, simulation, Control, Fault Detection and Isolation</td>
</tr>
<tr>
<td>9.</td>
<td>Focus R&amp;D</td>
<td>Software Research</td>
</tr>
<tr>
<td>10.</td>
<td>Greenhat Technologies</td>
<td>Web Based Education Systems</td>
</tr>
<tr>
<td>11.</td>
<td>Sparsha Learning Technologies</td>
<td>Education Technology Development, Develop and market software, teaching, learning in different areas</td>
</tr>
<tr>
<td>12.</td>
<td>Intinno Technologies Pvt. Ltd.</td>
<td>Education based collaboration software used by students and professors. This has launched new software called “Pathshala”</td>
</tr>
<tr>
<td>13.</td>
<td>Lalaland</td>
<td>Customized Printing and export of attire</td>
</tr>
<tr>
<td>14.</td>
<td>Biswanath Dey</td>
<td>ATM card billing system. The proprietor is a</td>
</tr>
</tbody>
</table>
15. RISUG  Created a new drug molecule in medical science for male contraception
16. Softlore Solutions  Customized ERP module creation and installation in educational institutes

Companies at STEP Gopali premises :

<table>
<thead>
<tr>
<th>#</th>
<th>Companies of STEP / TBI</th>
<th>Major Entrepreneurial Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Electro Thermal Insulation</td>
<td>In the field of Insulation wires and polymer insulations</td>
</tr>
<tr>
<td>2.</td>
<td>Sandhya Glass works</td>
<td>Glass cutting work. Design of glass mirrors</td>
</tr>
<tr>
<td>3.</td>
<td>Gulton Rubber works</td>
<td>Making of Risk husk rollers</td>
</tr>
<tr>
<td>4.</td>
<td>Balaji Mushroom</td>
<td>Engaged in the production of mushrooms</td>
</tr>
<tr>
<td>5.</td>
<td>Raghunath Fertilizer</td>
<td>Vermi-compost and organic vegetables</td>
</tr>
<tr>
<td>6.</td>
<td>Puja Enterprise</td>
<td>Printing and manufacture of eco-friendly bags</td>
</tr>
<tr>
<td>7.</td>
<td>Renuka Polymer</td>
<td>Rubber husk polishers for rice mills</td>
</tr>
<tr>
<td>8.</td>
<td>KE Technical Textile Pvt. Ltd.</td>
<td>Facilities of weaving, processing and coating of fabric with various Polymers &amp; Resin systems</td>
</tr>
</tbody>
</table>

There are other 8 companies under the incubation of TIETS, SRIC, IIT Kharagpur.

iii) Other Assistance of Entrepreneurial Activities
   (a) Entrepreneurship support through MSME grant.
       STEP has successfully established the MSME center which supports the local people to take loans for small industries working. 5 proposals have been duly granted sanction. One of them includes our trained grass-root entrepreneur.
   (b) Commercialization of prototypes by TREMAP support.
       TREMAP supports developed innovative prototype commercialization by refinement and industry collaboration.
   (c) Conducting Entrepreneurship Awareness camps
       E-Cell has played a very vital role in helping STEP for successfully promoting the benefits of initiating venture creation at various departments to sensitize the student and faculty members for start-up. The result has been huge with many students coming forward to get their companies registered at STEP.

iv) New Initiatives taken
   (a) Construction Decision for School of Engineering Entrepreneurship (SoEE) building at STEP
(b) Extension of the STEP Main Building by constructing 1st floor for SoEE faculty rooms,
(c) Renovation of the STEP Old Building for SoEE Class-rooms
(d) Renovation of the Tea Processing Lab as Innovation Lab for the SoEE students entrepreneurs.

v) Alternative incubation facilities decision for entrepreneurs at STEP - Gopali Campus and creation of a cluster.

NEW ACQUISITIONS

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Company</th>
<th>Area of working</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>PervCom Consulting Pvt. Ltd.</td>
<td>Developing devices and system solutions for remote tracking and monitoring.</td>
</tr>
<tr>
<td>2.</td>
<td>Aptsource Software Pvt. Ltd</td>
<td>Business workflow automation and integration, business intelligence and decision support, and service-oriented architecture/enterprise.</td>
</tr>
<tr>
<td>3.</td>
<td>Delta Electrical Industries</td>
<td>Green lighting manufacturing and commercialization have created polymeric mould which makes the led lighting multi-directional.</td>
</tr>
<tr>
<td>4.</td>
<td>Ikure Tech Soft Pvt. Ltd</td>
<td>Health applications to facilitate the patients data delivery. Create and manage a huge database of patients, doctors and hospitals.</td>
</tr>
<tr>
<td>5.</td>
<td>Meridian Software Technology (P) Ltd.</td>
<td>Development of a software tool for SPICE modeling and parameter extraction</td>
</tr>
<tr>
<td>6.</td>
<td>Aunwesha Knowledge Technologies</td>
<td>The major products of the company have been migrated to the new LearnITy framework.</td>
</tr>
<tr>
<td>7.</td>
<td>Brolly</td>
<td>Works on rural technology adoptions, standardization, and appropriations of microfinance. The company has received (UNDP) grants.</td>
</tr>
<tr>
<td>8.</td>
<td>Techsys India.</td>
<td>Focused on creating value and trust for our clients in changing business scenarios.</td>
</tr>
<tr>
<td>9.</td>
<td>Biswajit Das</td>
<td>Sampling various varieties of fruits like HYV grafts of fruits, foliage and indoor plants</td>
</tr>
<tr>
<td>10.</td>
<td>Ashtami Enterprise</td>
<td>Manufacturing the rubber works for industrial purpose</td>
</tr>
</tbody>
</table>
11. Balaji Enterprise Manufacturing the ball bearing assembly material for Tata Matalinks.

SHORT-TERM COURSES

1. SIDBI grass-root entrepreneurship and skill development training program
2. Vermi-compost training programs to promoting organic farming and green practices
3. Tea Board supported tea garden maintenance program

COLLABORATIVE EFFORTS

1. Celebrated the STEP day in April 2010 with the honorable Director, IIT, Kharagpur. He along with other esteemed members took decision for proposed SoEE in STEP Campus
2. Celebrated Saraswati Puja in January 2010 jointly with Entreprenrus and E-Cell students as requested by the existing incubatees of STEP / TBI
3. Prof. Ikhlaq Siddhu, University of Berkeley visited STEP for inaugurating the “Cleantech Challenge” B Plan contest organized by Nation Growth Venture Lab (NGVL)
4. Conducted proposal screening for West Bengal Venture Capital Ltd., The Official venture capital of organization of West Bengal
5. National Global Venture Lab has been set up to promote research interactions with international universities like UC Berkeley and University alliance, Finland
6. Collaboration with the N. L. Khan Women’s college for the entrepreneurship awareness among women students. E Cell has been created and the faculties have been given training on how to motivate their students for business creation
7. STEP committee on the request of Bengal National Chamber of Commerce & Industries (BNCCI) to nominate IIT official for joint ventures, collaboration with them to conduct programs jointly for mutual benefit

LECTURE BY VISITING EXPERT

1. Prof. Ikhlaq Siddhu, Director of Center for entrepreneurship and technology (CET) University of Berkeley, California in October 2010
2. Prof. Hekki Hanka, Director of the Department of Art and Culture Studies and Professor in Art History at University of Jyväskylä, Finland in December 2010
3. Prof. Dipankar Chakarborty, Vice dean for The Johns Hopkins Carey Business School Baltimore, MD in March 2010

4. Mr. Vasant Subhramanium, President, TiE Kolkata visited in the month of October 2010

SEMINARS / WORKSHOPS / CONFERENCES ORGANIZED BY THE UNIT

Ongoing Training Programs under the space of STEP

Various training programs have been conducted to facilitate entrepreneurship and innovation ecosystem at STEP. These include the

1. SIDBI skill upgradation programs for grass-root entrepreneurs
2. Tea Processing Training Program
3. Training for Vermi-compost manufacturing and sale
TRAINING & PLACEMENT SECTION

PROFESSOR-IN-CHARGE: Professor Suneel Kumar Srivastava

PLACEMENT DETAILS

The Training and Placement Section is responsible for arranging practical training for 3rd year students and job placement of final year students graduating from the Institute. The Section 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 Training & Placement Section gives feedback to the Institute on the academic programmes.

143 companies / organizations visited the campus for recruitment and 20 others preferred to have telephonic interview, videoconference and call the students for interviews to their offices during 2009-2010. The details of number of students who had registered for placement and those actually placed through campus interviews including those who expected to have opted for higher studies / got jobs through off campus as on 06-05-2010 are as follows:

<table>
<thead>
<tr>
<th>Course/Degree</th>
<th>No. of students registered</th>
<th>No. of students placed</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.Tech. (Hons.)</td>
<td>395</td>
<td>365</td>
</tr>
<tr>
<td>B.Arch. (Hons.)</td>
<td>018</td>
<td>017</td>
</tr>
<tr>
<td>M.Sc.</td>
<td>186</td>
<td>134</td>
</tr>
<tr>
<td>Dual Degree M.Tech.</td>
<td>202</td>
<td>176</td>
</tr>
<tr>
<td>M.Tech./MCP</td>
<td>542</td>
<td>330</td>
</tr>
<tr>
<td>M.B.M.</td>
<td>077</td>
<td>073</td>
</tr>
<tr>
<td>Ph.D./MS</td>
<td>027</td>
<td>022</td>
</tr>
<tr>
<td>Total</td>
<td><strong>1447</strong></td>
<td><strong>1117</strong></td>
</tr>
</tbody>
</table>

SUMMER TRAINING

Eight weeks of summer practical training at the end of 3rd year B. Tech/Dual Degree and 4th 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 abroad, for summer training. An emergent trend is that more and more students are seeking summer training abroad.

A total of 1456 companies / organizations in India were contacted for training facilities for the current summer vacations in May-July 2010. Among these 124 in India had offered training facilities, out of which 55 organizations had extended out-of pocket allowances (covering 220 students) and many other extended subsidized transport, subsidized canteen, subsidized accommodation and to-and fro 3AC fare for our students/ The highest out of pocket allowance of Rs. 30,000.00 per month was paid by DE Shaw, Barclays Capital, Deutsche Bank, Google, Qualcomm, Microsoft, Yahoo extended Rs. 25,000.00 per month,
ITC, Deloitte, Oracle, Amazon, IBM Limited extended Rs 20,000.00. There are about 15 companies like Bharat Dynamics, ACC Limited, Mentor Graphics, Tega Industries, Reliance India Limited, Infosys, Innopark, Dr. Reddy’s Lab, Siemens, Tata Steel, Schlumberger, Goldman Sachs offered stipend in the range Rs. 10,000.00 to 20,000.00 per month and around thirty companies offered below Rs. 10,000.00 per month.

About 240 students will take up summer training in organizations abroad during the summer 2010. During summer 2010, a total of 772 third / fourth year B.Tech. / Dual Degree and M. Sc. students were placed for summer training. The Department of Mining Engineering handled the placements of their students for summer training separately. A number of B.Tech. / Dual / M.Sc. students were also placed for optional training where MOU to the Institute.

**STUDENT PARTICIPATION**

To harness the student power, a formal system of student participation in the process had been initiated during 2005-2006. This has evolved and the 2009-2010 placement saw students participating in running placement process. In fact, through this participation it was possible to run up to seven / eight companies per day and round the clock. Students take active part in calling up companies and managing the logistics of placement.
TECHNOLOGY TELECOM CENTRE

PROFESSOR-IN-CHARGE : Professor Sant Sharan Pathak

Officer :

Gupta, Pankaj Engineer

NEW PLANNING

i) To install a LIM with optical fiber connectivity in the Guest House.

ii) Planning to lay cable to the newly built A-type quarters in the Dandakaranya area.

iii) To provide STD facility in the Guest House with local billing provisions.

iv) To provide connections to the rooms of V. Niwas Guest House (VGH) and its neighbourhood from a new distribution box of LIM at Guest House.

WORK CARRIED OUT

i) Laying of underground cable to each independent quarter (B and C1-type) in Dandakaranya area to minimize the maintenance problem.

ii) Emergency telephone service have been provided in every block of the Vikram Sarabhai Research Complex.

iii) The capacity of DSLAM is upgraded by 48 parts.

iv) Nearly 30 nos. of new connections have been given to new faculties and new laboratories.

ROUTINE MAINTENANCE

i) Facility has been created for complaint to be lodged in person, over phone and also online through Institute website.

ii) Complaints have been attended and problems rectified within 2 days in almost every case.
TECHNOLOGY STUDENTS’ GYMKHANA

PRESIDENT: Professor Manish Bhattacharjee

ACTIVITIES

Inter IIT Sports Meet

The 45th Inter IIT Sports Meet began with the Inter IIT Aquatic Meet held during October 2-5, 2009, at IIT Kanpur. IIT Kharagpur secured the overall THIRD position in Swimming (Men’s) and overall SECOND position in Swimming (Women’s). Once again the brilliant performance of Chirag Fialoke, a third year UG student, was the highlight of the meet. He won four Gold Medals and created one new meet record in 200 m freestyle.

The second phase of the Inter IIT Sports Meet was held during December 11-18, 2009. Highlights of IIT Kharagpur team performance was a Silver Medal in Table Tennis (M), and Bronze Medals in Football and Weight Lifting.

Inter Hall Competitions in Sports & Games

During the Autumn Semester, Inter Hall Competitions started with the Inter Hall Aquatic competitions in the month of August 2009. Chirag Fialoke of RP Hall won the Individual Championship. Inter Hall Athletics Meet was held during November 14-15, 2009.

In the Spring Semester, the second phase of Inter Hall Competitions in badminton, basketball, cricket, football, hockey, table tennis, tennis, volleyball and weight lifting were held. Patel Hall of Residence won the General Championship in Sports & Games.

The Inter Hall Competitions among the girl’s hostels were also conducted in table tennis, badminton, swimming and basketball.

Inter Hall Competitions in Social & Culture Events

As usual the Inter Hall Competitions in various social and culture events were organized. The traditional Inter Hall Illumination & Rangoli competition was held with all the Halls of Residence participating with great spirit and fervor. Professionals drawn from relevant fields were invited from Kolkata to judge the event.

Inter Hall Competitions in Technology

Inter Hall Competitions in Technology were held in various categories.

MAJOR EVENTS ORGANISED

Shaurya’09
Technology Students’ Gymkhana organized SHAURYA‘09, an Inter-College Sports Meet, from 31st October to 3rd November 2009. This year few more games were included. Competitions in Badminton, Basketball, Cricket, Tennis, Volleyball, Hockey and Table Tennis were held. Five colleges, namely, St. Xavier’s, Ranchi, KIIT, Bhubaneswar, Marine Engineering College, Kolkata, NIT, Trichi, Benaras Hindu University, St. Xavier’s, Kolkata and IIT Kharagpur took part. IIT Kharagpur won Gold in Badminton and Silver in Basketball, Volleyball, Table Tennis, Football, Hockey and Tennis.

Spring Fest’10

The Annual Social Cultural Festival, Spring Fest ’10, was celebrated in the month of January 2010 from 21st to 24th. Spring Fest’10 witnessed the usual overwhelming participation from various prestigious institutions and colleges across the country. For the first time, Star Nites were held in the Jnan Ghosh Stadium which turned out to be a huge success. Highlights from the fest include performances by eminent artists such as renowned music composer Pritam Mukherjee, Kailash Kher and India’s most renowned heavy metal band, Kryptos. Spring Fest played host to the internationally acclaimed play ‘Dance Like A Man’; performance by the slide guitarist Debashish Bhattacharya and jazz performance by Gilad Dobrecky and Freddie Bryant. Other major attractions were classical dance by ‘Sahaj Padma’, MTV Stunt Mania, Youth Marathon and a Blood Donation Camp.

Kshitij’10

Kshitij – the annual techno management festival was organised from 28th January to 31st January 2010. Around 5000 students from various colleges in India and abroad took part in various events like Business Plan, Case Studies to Paper Presentations, Industrial Design Problems, Computer Programming and Robotics. Prizes worth Rs. 50.0 Lakh were awarded to participants. Kshitij played host to numerous towering personalities in technical as well as managerial domains including the likes of Sir Anthony Leggett (Nobel Prize Winner), Dr. A. Sivathanu Pillai (CEO and MD of Brahmos Aerospace), Prof. Chris Phillips (the Invisible man) and Robin Chase (One of Time’s 100 most Influential people). Hands-on workshops on varied topics like those on Ethical Hacking, Microcontrollers, Hot Air Ballooning, Patenting and Autonomous Robots gave the students an opportunity to learn from the experts in the respective fields. A multitude of exhibitions from the one on Solar Car to Fog Screen to DRDO, proved to be a visual treat for the audience with its rare blend of technology, science and entertainment. Kshitij is associated with world renowned organizations in ASME (American Society of Mechanical Engineers), ACM, ASHRAE and IMechE. The fest drew participation from all corners of the country and even abroad in a wide array of events organized to gauge the technical dexterity and managerial acumen of bright young minds.

OUTSIDE PARTICIPATIONS

The Cricket Team of IIT Kharagpur participated in the Inter University Twenty-20 Cricket tournament organized by the Cricket Association of Bengal.

DEVELOPMENTS
Technology Students’ Gymkhana has formed a Technology Adventure Sports Society started with a few student members. In April-May 2010, a team of 20 students including two girls trekked to Pindari Glacier with Mr. Sudhir Kumar, PTI (TA) leading the team.

FACILITIES

i) Gymnasium with modern equipment  
ii) Billiards  
iii) Athletics stadium with modern training facilities  
iv) Two cricket fields with two turf wickets. One practice net having two turf wickets and one concrete wicket.  
v) One hockey and one football field in the Tata Steel Sports Complex  
vi) One jogging-cum-walking track inside the Tata Steel Sports Complex.  
vii) Six tennis courts including two floodlit courts  
viii) Two floodlit volleyball courts  
ix) Two floodlit Basketball courts  
x) One wooden surface badminton court  
xi) Table tennis room with four tables  
xii) Standard swimming pool

ANNUAL PRIZE DISTRIBUTION CEREMONY & FAREWELL PROGRAMME FOR GRADUATING STUDENTS

The Prize distribution ceremony and farewell to final year students was held on 15th April, 2010. Director Prof. D. Acharya presided over the function. Eight Institute Blues in Sports & Games, Five Order of Merit in Soc. & Cult and in Technology were awarded to final years for their outstanding achievements in respective fields. Mr. Bipul Kumar, an outgoing final year UG student, was awarded the prestigious Bhandarkar Trophy for his outstanding performance in Athletics and Hockey. Mr. Chirag Fialoke, a third year UG student, received the Alumni Trophy for his brilliant performance in the Inter IIT Aquatics Meet. Mr. Vikash Kumar received the Ankik Dhar Memorial Trophy for all round performance in sports, social & culture and technology. This trophy is introduced in the name of Ankik Dhar, a brilliant performer in academics, sports and social & culture.
PART - III

STATISTICAL INFORMATION
Table A-1  ADMISSION TO UNDERGRADUATE (B.TECH. / B.Arch. / M.Sc. / Dual Degree) COURSES IN THE SESSION 2009-2010

Table A-2  ADMISSION TO 2-YEAR M.Sc. COURSES, 2009–2010

Table A-3  DISCIPLINE-WISE BREAK-UP OF STUDENTS AWARDED M.C.M. SCHOLARSHIP 2009-2010
Rate of Scholarship : Rs.1000/- p.m. plus Free-tuitionship

Table A-4A  STUDENTS AWARDED ONLY FREE TUITIONSHIP 2009-2010

Table A-4B  STUDENTS GRANTED TUTION FEE EXEMPTION (ONLY SC / ST) 2009-2010

Table A-5  STUDENTS (SC & ST) AWARDED FINANCIAL ASSISTANCE 2009-2010
Rate : Pocket Allowance Rs.250/- p.m. plus Free Messing

Table A-6  A. STUDENTS AWARDED ENDOWMENT PRIZES : 2009–2010
B. STUDENTS AWARDED ENDOWMENT MERIT SCHOLARSHIP : 2009-2010

Table A-7  STUDENTS AWARDED SCHOLARSHIPS BY EXTERNAL AGENCIES (2009-2010)

Table A-8  STUDENTS FROM FOREIGN COUNTRIES ON ROLL OF UNDERGRADUATE COURSES, CLASS WISE, 2009–2010

Table A-9  COUNTRY-WISE DISTRIBUTION OF FOREIGN STUDENTS (2009-2010)

Table A-10  STUDENTS ON ROLL – UNDERGRADUATE (B.Tech. / B.Arch. / M.Sc. / Dual Degree) COURSES AT THE BEGINNING OF THE SESSION 2009–2010

Table A-11  STATEMENT OF RESULTS (UNDERGRADUATE) 2009–2010
## TABLE : B-1

**ADMISSION TO POSTGRADUATE COURSES IN 2009-2010**

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### TABLE: C-2

**NUMBER OF MS STUDENTS ENROLLED DURING 2009-2010**
*(01/07/2009 TO 30/06/2010)*

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<th>Deptt./Centre/School</th>
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<th>SC</th>
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TABLE: C-3
NUMBER OF POST DOCTORAL FELLOWS ENROLLED DURING 2009-2010
(01/07/2009 TO 30/06/2010)

<table>
<thead>
<tr>
<th>Deptt./Centre/ School</th>
<th>Total</th>
<th>Genl.</th>
<th>SC</th>
<th>ST</th>
<th>OBC</th>
<th>Male</th>
<th>Female</th>
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</table>

TABLE: C-4
UGC SCHOLARS ENROLLED DURING 2009-2010
(01/07/2009 TO 30/06/2010)

<table>
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<tr>
<th>Dept/Centre/ School</th>
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<th>General</th>
<th>SC</th>
<th>ST</th>
<th>OBC</th>
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<tr>
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<td>NUMBER OF RESEARCH SCHOLARS FROM <em>OTHER COUNTRIES</em></td>
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<td>(01/07/2009 TO 30/06/2010)</td>
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<tr>
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</table>
**TABLE : C-6**

**NAMES OF THE PH.D. DEGREE RECIPIENTS**

<table>
<thead>
<tr>
<th>Department / Centre / School</th>
<th>Name of the Degree Recipients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Engineering</td>
<td>Haraprasad Roy, Sintu Singha</td>
</tr>
<tr>
<td>Architecture and Regional Planning</td>
<td>Maitreyi Maiti, Somen Chakraborty</td>
</tr>
<tr>
<td>Biotechnology</td>
<td>Dibyarupa Pal, Chitrangada Acharya, Rupesh Dash, Srirupa Das, Tumpa Dutta, Shireen Meher Kotay, Chaithanya Madhurantakam, Sujit Kumar Bhutia, Palashpriya Das</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>Mitali Das, Raj Mohan B., Saptarshi Majumdar, Biswajit Sarkar, Animes Kumar Golder, Chittaranjan Mohanty, Pratik Swarup Dash, Jaya Narayan Sahu</td>
</tr>
<tr>
<td>Department / Centre / School</td>
<td>Name of the Degree Recipients</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>Sudhanshu Sekhar Das, Sanghamitra Kundu, Debasis Basu, Sridhar R., Debasisish Bandyopadhyay, Tushar Kumar Nath, Malay Kanti Ghosh, Pradyumna S., Namita Nanda, Pradeep Kumar Sahoo, Pabitra Ranjan Maiti, Kapileswar Mishra, Bappaditya Manna</td>
</tr>
<tr>
<td>Computer Science and Engineering</td>
<td>Themrichon Tuithung, Sandip Aine, Santosh Biswas, Monalisa Sarma, Bhaskar Pal, Samit Bhattacharya, Ashok Kumar Das, Dipankar Das</td>
</tr>
<tr>
<td>Cryogenic Engineering</td>
<td>Arunkumar Samanta</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>Sharmili Das, Savier J. S., Bani Kanta Talukdar, Sourav Patra, Mukti Barai, Jagabondhu Hazra, Somnath Maity, Kundu Prasanta, Arun Kishore W.C., Suman Maiti, Archana Gopal Thosar, Umesh Chandra Pati</td>
</tr>
<tr>
<td>Geology and Geophysics</td>
<td>Lopamudra Saha, M. Yanger Walling, Soma De, Raj Kumar Singh, Jagatbikas Nanda, Sanjit Kumar Pal, Dinesh Pandit, N. Sulekha Rao, Pritam Nasipuri, Sukhen Majumder</td>
</tr>
<tr>
<td>G. S. Sanyal School of Telecommunications</td>
<td>Preetam Kumar</td>
</tr>
<tr>
<td>Humanities and Social Sciences</td>
<td>Kakulavarapu Manasa, Anathbandhu Patra, Smriti Kumari, Indiwar Misra, Mahua Verma, Atri Sengupta, Tirumala Santra, Usha Lenka, Supriti Mishra, D Baby Moses, Laxmi Bilash Hota</td>
</tr>
<tr>
<td>Department / Centre / School</td>
<td>Name of the Degree Recipients</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>Industrial Engineering and Management</td>
<td>Sooraj P., Pradip Kumar Bala, Santanu Sinha, N S Arunraj, Deepayan Shome, Anupam Das</td>
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<tr>
<td>Information Technology</td>
<td>Rajiv Misra, Soumya Pandit</td>
</tr>
<tr>
<td>Mathematics</td>
<td>Shanta Kumari Sunanda, Jayanta Kumar Dash, Amit Kumar Verma, Debasish Giri, Ashok Kumar Singh, Chanchal Kundu</td>
</tr>
<tr>
<td>Medical Science and Technology</td>
<td>Shantanu Sur</td>
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<tr>
<td>Mining Engineering</td>
<td>Ravi Krishnarao Jade, Kaushik Pal, Bijay Mihir Kumar, Gnananandh Budi, Tukkaraja Purushotham</td>
</tr>
<tr>
<td>Ocean Engineering and Naval Architecture</td>
<td>Mihir Chandra Manna, Pankaj Biswas, Mihir Kumar Pandit, Debabrata Karmakar, Rajesh Kumar R.</td>
</tr>
<tr>
<td>Department / Centre / School</td>
<td>Name of the Degree Recipients</td>
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<tr>
<td>--------------------------------------</td>
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<tr>
<td>Reliability Engineering</td>
<td>Saravana Kumar K., Annamraju Syamsundar, Dokiburra Edwin Vijay Kumar</td>
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<tr>
<td>Rubber Technology</td>
<td>Haimanti Datta, Jinu Jacob George, Sukanya Satapathy, Anjan Biswas</td>
</tr>
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<td>Department / Centre / School</td>
<td>Name of the Degree Recipients</td>
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<tr>
<td>------------------------------------------------</td>
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<td>Chemical Engineering</td>
<td>S. Manigandan</td>
</tr>
<tr>
<td>Cryogenic Engineering</td>
<td>Soumen Kar</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>Ananyo Sengupta, Subhasish Mukherjee, Subho Chatterjee, Ashis Maity, Jyotirmoy Ghosh</td>
</tr>
<tr>
<td>G. S. Sanyal School of Telecommunications</td>
<td>Siva Ram Krishna Vadali</td>
</tr>
<tr>
<td>Industrial Engineering and Management</td>
<td>Sumanas Bhattacharya, Venkata Pallavi A</td>
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<tr>
<td>Information Technology</td>
<td>Chinmaya Misra, Somak Bhattacharya, Amlan Kundu, Alokesh Chattopadhyay, Syamantak Das, Suprio Das, Subhendu Aich</td>
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<tr>
<td>Department / Centre / School</td>
<td>Name of the Degree Recipients</td>
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<td>Materials Science</td>
<td>R. Rajasekar, Pravin Bhimrao Sawai</td>
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<td>Abhijit Verma</td>
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<tr>
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<td>Neelesh Bhattacharya</td>
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# INDIAN INSTITUTE OF TECHNOLOGY
Kharagpur

RECEIPT AND PAYMENT ACCOUNT FOR THE YEAR ENDED 2009–2010

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<th>#</th>
<th>RECEIPTS</th>
<th>AMOUNT (Rs.)</th>
<th>#</th>
<th>PAYMENTS</th>
<th>AMOUNT (Rs.)</th>
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<td>I</td>
<td>Opening Balance (Bank Balances)</td>
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<td>a) Establishment Expenses</td>
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<td>b) In Deposit accounts</td>
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<td>c) In Savings accounts</td>
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<td>II</td>
<td>Grants Received</td>
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<td>Investments and deposits made</td>
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<td>From Government of India</td>
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<td></td>
<td>a) Out of Earmarked / Endowment Funds</td>
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<td>c) Out of Own Funds &amp; Others</td>
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<td>Income on Investments from</td>
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<td>Expenditure on Fixed Assets &amp; Capital Work-in-progress</td>
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<td>a) Earmarked / Endowment Fund</td>
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<td>Interest Received</td>
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<td></td>
<td>a) On Bank deposits</td>
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<td>b) Recoverable Advances</td>
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<td>Closing Balances</td>
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<tr>
<td>V</td>
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<td>a) In current accounts</td>
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<td>Amount Borrowed</td>
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<td>TOTAL</td>
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RESEARCH PUBLICATIONS
DEPARTMENT OF AEROSPACE ENGINEERING

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.
RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.
RESEARCH PUBLICATIONS

Journals:

1.

Seminars / Workshops / Conferences:

1.
DEPARTMENT OF BIOTECHNOLOGY

RESEARCH PUBLICATIONS

Journals:

1.

Seminars / Workshops / Conferences:

1.
DEPARTMENT OF CHEMICAL ENGINEERING

RESEARCH PUBLICATIONS

Journals:

1.

Seminars / Workshops / Conferences:

1.
DEPARTMENT OF CHEMISTRY

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.
DEPARTMENT OF CIVIL ENGINEERING

RESEARCH PUBLICATIONS

Journals:

1.

Seminars / Workshops / Conferences:

1.
RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.
RESEARCH PUBLICATIONS

Journals:

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Seminars / Workshops / Conferences:

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RESEARCH PUBLICATIONS

Journals:

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Seminars / Workshops / Conferences:

1.
RESEARCH PUBLICATIONS

Journals:

1.

Seminars / Workshops / Conferences:

1.
RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.
RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.
DEPARTMENT OF MATHEMATICS

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.
DEPARTMENT OF MECHANICAL ENGINEERING

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.
DEPARTMENT OF METALLURGICAL & MATERIALS ENGINEERING

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.
DEPARTMENT OF MINING ENGINEERING

RESEARCH PUBLICATIONS

Journals:

1.

Seminars / Workshops / Conferences:

1.
RESEARCH PUBLICATIONS

Journals:

1.

Seminars / Workshops / Conferences:

1.
RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.
CENTRE FOR EDUCATIONAL TECHNOLOGY

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.
CENTRE FOR OCEANS, RIVERS, ATMOSPHERE AND LAND SCIENCES

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.
CRYOGENIC ENGINEERING CENTRE

RESEARCH PUBLICATIONS

Journals:

1.

Seminars / Workshops / Conferences:

1.
MATERIALS SCIENCE CENTRE

RESEARCH PUBLICATIONS

Journals:

1.

Seminars / Workshops / Conferences:

1.
RELIABILITY ENGINEERING CENTRE

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.
RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.
RURAL DEVELOPMENT CENTRE

RESEARCH PUBLICATIONS

Journals :

1.

Seminars / Workshops / Conferences :

1.
RAJIV GANDHI SCHOOL OF INTELLECTUAL PROPERTY LAW

RESEARCH PUBLICATIONS

Journals:

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Seminars / Workshops / Conferences:

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RESEARCH PUBLICATIONS

Journals:

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Seminars / Workshops / Conferences:

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Journals :

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Seminars / Workshops / Conferences :

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RESEARCH PUBLICATIONS

Journals :

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Seminars / Workshops / Conferences :

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32. Compatibility study of diamond – like nanocomposite thin films with hydrazine


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33. S.K. Lahiri and S. Das, Quartz MEMS for inertial sensing, ISSS 3rd national conference on MEMS, Smart structures and materials, CGCRI, Kolkata, (2009)


38. A. Bhattacharya, R.R. Chaudhuri, S. Chakraborty, T.K. Bhattacharyya, Reduced order macromodel extraction of MEMS based varactor and its system level simulation for RF applications, 4th InternationalConference on Computers and Devices for Communication, CODEC, Kolkata, 1-4, 2009


41. A. Ray Chaudhuri, S. Chakraborty, A. Bhattacharya, R. Ray Chaudhuri, T.K.
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47. S. Chakraborty, T.K. Bhattacharyya, Development of surface-micromachined binary logic gate for low frequency signal processing in MEMS based sensor applications, accepted in MicroTech Conference and Expo, 2010, to be held at CA from June 21-25, 2010

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1. Sanjay Chatterji, Praveen Sonare, Sudheshna Sarkar and Devshri Roy, Grammar Driven Rules for Hybrid Bengali Dependency Parsing, 7th International Conference on Natural Language Processing (ICON 2009), NLP Tool. Contest: Indian Language Dependency Parsing, Hyderabad, India, Dec 14-17, pp 38-42


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7. Magnetic Circular Dichroism spectroscopy in epitaxial La$_{0.7}$Sr$_{0.3}$MnO$_3$ thin films, T. K. Nath, J. R. Neal and G. A. Gehring Journal of Applied Physics, 105, 07D709/1-07D709/3 (2009)
11. Complex Impedance Spectroscopy of ZnO and Zn$_{0.5}$TM$_{0.1}$O (TM = Co, Mn and Fe) Semiconducting Nanoparticles, S. K. Mandal, T. K. Nath and I. Manna, Nanoscience and Nanotechnology Letters 1, 99 (2009)


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10. Multi-decker Sandwich Complexes Using Be3(2-) and Mg3(2-) Dianions By P. K. Chattaraj and S. Giri, Int. J. Quantum Chem.(Special Issue on Professor Istvan Mayer’s 65th Birthday), 109, 2373 (2009)
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41. Influence of nanoclay on the adhesive and mechanical properties of polysulfide modified epoxy resin “Accepted in Polymers and Polymer composites”, in November, 2009

42. “Liquid Polysulfide Modified epoxy hybrid nanocomposites filled with nanosilica particles” manuscript under preparation for favour of publication in the International Journal


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1. Anil Kumar Sahu and B. K. Sarkar, Reduction of Actuation Voltage of RF MEMS Capacitive Switch
2. Nanolayer Reinforcement of Elastomeric Polyurethane Network, in “India International Rubber Conference” on 1st – 3rd November, 2007 at Udaipur Rajasthan, India
3. Morphology, structure and properties of polyurethane / layered silicate nanocomposites, in “International Conference of Rubber and Rubber Like Materials” on 8th – 10th January, 2008 at IIT Kharagpur, Kharagpur – 721302, India


15. Anil Kumar Sahu and B K Sarkar “Reduction Of Actuation Voltage Of RF MEMS Capacitive Switch” accepted for presentation at the International Radar Symposium India (IRSI-2009) at Bangalore during the period Dec.08-11, 2009


17. Arun Kumar Shukla and B.K.Sarkar “Design Considerations Of High Power Impulse Radiating Antenna For Directed Energy Weapon System” accepted for presentation at the International Conference on Electronic Warfare to be held at Bangalore in Feb. 10, 2010


19. B.K.Sarkar “ Smart Antenna for Interference Rejection” accepted for presentation at


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