ANNUAL REPORT 2012-2013

Indian Institute of Science Education and Research(IISER) Mohali

March 31, 2013

Contents

1 Preface

IISER Mohali is young, and in a young and upcoming institute we always have a number of firsts. But some firsts are very special, worthy of a pause and introspection to see how far we have come. The year 2012 saw the first batch of BS-MS dual degree students graduate and move on to the next stage in their respective lives. They were awarded degrees in a convocation in July 2012. Hereafter, the cycle of students graduating and new eager faces taking their place will repeat each year but the graduation of the first batch is a special moment in the history of any institute. From now on, the strength of the institute will be measured by the quality of students trained here. From now on, all eyes will be on the students emerging from IISERs to see how they change the landscape of research in academia and industry.

Last year was also very important in that the NIT amendment act was passed by the parliament and the amendment includes rules for governance of IISERs. The act also enables IISERs to award degrees.

The Indian Institutes of Science Education & Research (IISERs) were established by the Ministry of Human Resource Development (MHRD), Government of India, based on the recommendation of the Scientific Advisory Council to the Prime Minister. Five IISERs have been created and are functioning at Pune, Kolkata, Mohali, Bhopal and Thiruvananthapuram. The basic mandate of the IISERs is to carry out research in frontier areas of science and to provide quality science education at the undergraduate and the postgraduate level. Each IISER is an autonomous institution and awards its own degrees.

IISER Mohali's fully residential campus is coming up on 125 acres of land in the Knowledge City at Sector 81 Mohali. During 2012-13, all of the teaching activity shifted from the transit campus in Sector 26, Chandigarh to the campus at Knowledge City. Last of the research laboratories is in the process of shifting as the financial year comes to an end. The academic block I and the lecture hall complex have been in use for almost a year and finishing touches are being put to these facilities. The engineering building and the auxiliary apartments were handed over to the institute this year. Construction of the visitors hostel, academic block II, informatics centre, animal facility, health centre, community centre, two more hostels and a multi-story residential block is in full progress and is likely to be completed during 2013-14. Work on the administrative building has started recently. All in all, we expect a strong growth in the intensity of the academic and research program as more facilities become available.

IISER Mohali started functioning in 2007 with the first batch of the five year BS-MS dual degree students. The program has been structured to promote interdisciplinarity and a significant research component. The core part of the program provides comprehensive training in all basic sciences during the first two years. Students are expected to choose a subject to major in for the remaining three years where the curriculum is divided between mandatory courses, subject electives and open electives. Open electives can be taken in any subject and allow students to fashion their own programs. Apart

from courses in specific subjects, some inter-disciplinary courses are also offered on a regular basis. These courses are in areas that are useful to multiple branches of science, or are in distinct areas like earth, planetary and environmental sciences, computational sciences, etc. Courses in humanities & social sciences are also offered. With 146 courses on offer during the academic year 2012-13, there is clearly no dearth of choices for the students. The students are expected to work on short research projects during summer vacations, either at IISER Mohali or at research laboratories and institutes elsewhere. The students spend much of their time during their final year on a research project. The project culminates in a thesis and is expected to contain at least some original work. Some of the projects lead to publications in peer reviewed journals, giving our students an exposure to all stages of a research project at an early stage.

The number of students in the BS-MS program is 419 at present. While KVPY scholars are admitted "automatically" to the MS program, the JEE merit listed students are admitted on the basis of their ranks. The direct channel of admissions where top 1% of students in each board can apply became operational in 2010 and a number of students are joining IISERs through this channel. The BS-MS graduates of IISER Mohali are expected to take up science as a career, although the diverse skills gained will equip them to pursue high-profile careers in any field, including industry and government.

An opportunity cell has been set up at the institute. This functions with mentoring from a few faculty members. Dr. Samrat Ghosh was in charge of this activity during 2012 and Dr. Varadharaj Srinivasan has been looking after the activities in 2013. The cell helps students in finding out about appropriate opportunities for them for summer research and careers after graduation. A database of summer internship opportunities is maintained and is updated with the help of students to provide a comprehensive list of opportunities.

IISERs have a PhD program and the first few PhD theses have been submitted at IISER Mohali during this year. At present we have 130 students at various levels in the PhD program in biology, chemistry, mathematics, physics, earth and environmental sciences, and humanities and social sciences. The PhD program at IISER Mohali involves course work, a qualifying examination, thesis work and a thesis examination, leading to the award of a PhD degree. Besides research, the scholars are involved in several activities such as helping the faculty in laboratory sessions, seminars, journal clubs, workshops, etc.

During 2012-2013 the institute initiated the integrated PhD program. The program is meant for students who have completed an undergraduate degree from elsewhere and wish to pursue the Masters and PhD at IISER Mohali. A total of 18 students were admitted in this program in 2012.

IISER Mohali has a faculty strength of 57 spread over different disciplines. The faculty is selected on a highly competitive basis. Faculty members are given adequate support for setting up their laboratories. They have been getting significant support for their research program from funding agencies.

IISER Mohali aims to be the leading centre for research and education in basic sciences in the northern region. A significant development in this context has been the emergence of a network amongst research institutes in and around Chandigarh. The institute is also developing a synergetic network with other academic institutions both in India and abroad, and holds regular conferences, seminars and symposia in research areas as well as workshops aimed at addressing fundamental issues in science education in India.

J S Bagla
Dean R&D

2 Board of Governors (Up to Oct.6, 2012)

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  Department of Biotechnology (DBT)
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  New Delhi 110 001

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  Department of AYUSH
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  Bangalore 560 012

- Professor M. K. Surappa (Member)
  Director, IIT Ropar

Nangal Road, Rupnagar
Punjab 140 001.

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  Director,
  Indian Institute of Science Education & Research Pune
  900 NCL Innovation Park
  Homi Bhabha Road,
  Pune 411 008

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  Bhatnagar Fellow (CSIR)
  Centre for Cellular and Molecular, Biology
  Uppal Road, Hyderabad - 500 007

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  Director, Bose Institute
  Centenary Campus
  p1/12, C.I.T. Road, Scheme - VIIM
  Kolkata 700 054
  West Bengal

- Professor Ram Sagar (Member)
  Director,
  Aryabhatta Research Institute of Obervation Sciences (ARIES)
  Manora Peak
  Nanital 263 129
  Uttarakhand

- Dr. S. Kathiroli (Member)
  Chief Scientist
  National Institute of Ocean Technology NIOT Campus
  Velachery - Tambaram Main Road
  Narayanapuram, Pallikaranai
  Chennai 600 100
  Tamil Nadu

- Shri. S.K. Ray
  Joint Secretary & Financial Advisor
  Ministry of Human Resources and Development
  Shastri Bhawan
  New Delhi 110 001

- Professor Arvind
  IISER Mohali
  Sector 81, Mohali

- Professor Sudeshna Sinha
  IISER Mohali
  MGSIPAP Complex
  Sector 26, Chandigarh

- Professor N. Sathyamurthy
  Director, IISER Mohali
  MGSIPAP Complex
  Sector 26, Chandigarh

- Dr. P. Bapaiah (Secretary)
  Registrar, IISER Mohali,
  MGSIPAP complex,
  Chandigarh 160019.

3 Board of Governors (W.E.F. Oct.7, 2012)

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  Pocket 14, Sector 8
  Dwarka Phase I, New Delhi 110077

- Sh. Ashok Thakur, IAS (Member)
  Secretary (HE),
  Department of Higher Education,
  Ministry of Human Resource and Development,
  Shastri Bhavan,
  New Delhi 110001.

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  Chief Secretary
  Punjab Civil Secretariat
  Government of Punjab
  Room No. 28, 6th Floor
  Punjab Civil Secretariat
  Chandigarh 160 001

- Prof. P Balaram (Member)
  Director, Indian Institute of Science
  Bangalore 560 012

- Mr. J Sathyanarayana, IAS (Member)
  Secretary,
  Department of Electronic and Information Technology
  Ministry of Communication and Information Technology
  Government of India, Electronics Niketan, 6 CGO Complex
  Lodhi Road, New Delhi 110 003

- Dr. S Ayyappan (Member)
  Secretary,
  Department of Agriculture Research and Education (DARE)
  & Director General, ICAR
  Krishi Bhavan
  New Delhi - 110 114

- Prof. M K Surappa (Member)
  Director, IIT Ropar
  Nangal Road, Rupnagar
  Punjab 140 001.

- Ms Sarita Mittal (Member)
  Joint Secretary and Financial Advisor
  Ministry of Human Resource Development
  Department of Higher Education
  Room No. 317, Shastri Bhawan
  New Delhi 110 001

- Prof. N Sathyamurthy
  Director, IISER Mohali
  Knowledge City
  Sector 81, S A S Nagar, Mohali
  P.O. Manauli 140306

- Prof. Arvind
  IISER Mohali
  Knowledge City
  Sector 81, S A S Nagar, Mohali
  P.O. Manauli 140306

- Prof. Sudeshna Sinha
  IISER Mohali
  Knowledge City
  Sector 81, S A S Nagar, Mohali
  P.O. Manauli 140306

- Dr. P Bapaiah (Secretary)
  Registrar, IISER Mohali,
  Knowledge City
  Sector 81, S A S Nagar, Mohali
  P.O. Manauli 140306

4 Academic Senate

- Prof. N Sathyamurthy (Chairman)
  Director, IISER Mohali
  Knowledge City
  Sector 81, S A S Nagar, Mohali
  P O Manauli 140306

- Prof. Ashok Sahni (Member)
  Centre for Advanced Study in Geology
  Panjab University, Chandigarh

- Prof. S V Kessar (Member)
  Department of Chemistry,
  Panjab University, Chandigarh

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  Director, IMTECH, Sector 39
  Chandigarh

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  Emeritus Prof., Panjab University
  Chandigarh 160 014

- Prof. M K Surappa (Member)
  Director, IIT Ropar
  Nangal Road, Rupnagar
  Punjab -140 001

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  Vice-Chancellor, Panjab University
  Chandigarh

- Dr. Rakesh Tuli (Member)
  Director, National Agri-Food Biotechnology Institute (NABI)
  C-127, Industrial Area
  Phase VIII, Mohali 160 071

- Prof. K K Bhutani (Member)
  National Institute of Pharmaceutical Education and Research(NIPER)
  Sector 67, Phase X
  SAS Nagar, Mohali -160062

- Prof. Arvind (Member)
  Dean Students, IISER Mohali
  Knowledge City
  Sector 81, S A S Nagar, Mohali
  P O Manauli 140306

- Dr. Chanchal Kumar (Member)
  Dean Academics, IISER Mohali
  Knowledge City
  Sector 81, S A S Nagar, Mohali
  P O Manauli 140306

- Prof. Sudeshna Sinha (Member)
  IISER Mohali
  Knowledge City
  Sector 81, S A S Nagar, Mohali
  P O Manauli 140306

- Prof. A K Bachhawat (Member)
  Dean Faculty , IISER Mohali
  Knowledge City
  Sector 81, S A S Nagar, Mohali
  P O Manauli 140306

- Prof. P Guptasarma (Member)
  IISER Mohali, Knowledge City
  Sector 81, S A S Nagar, Mohali
  P O Manauli 140306

- Prof. J S Bagla (Member)
  Dean (Research and Development) , IISER Mohali
  Knowledge City
  Sector 81, S A S Nagar, Mohali
  P O Manauli 140306

- Prof. Ramesh Kapoor (Member)
  IISER Mohali,
  Knowledge City

Sector 81, S A S Nagar, Mohali
P O Manauli 140306

- Prof. C G Mahajan (Member)
  IISER Mohali,
  Knowledge City
  Sector 81, S A S Nagar, Mohali
  P O Manauli 140306

- Prof. I B S Passi (Member)
  Honorary Professor, IISER Mohali
  Knowledge City
  Sector 81, S A S Nagar, Mohali
  P O Manauli 140306

- Dr. Sanjay Mandal (Member)
  Associate Professor, IISER Mohali
  Knowledge City
  Sector 81, S A S Nagar, Mohali
  P O Manauli 140306

- Dr. N G Prasad (Member)
  Assistant Professor
  IISER Mohali,
  Knowledge City
  Sector 81, S A S Nagar, Mohali
  P O Manauli 140306

- Dr. Anu Sabhlok (Member)
  Assistant Professor
  IISER Mohali
  Knowledge City
  Sector 81, S A S Nagar, Mohali
  P O Manauli 140306

- Dr. P Bapaiah (Secretary)
  Registrar, IISER Mohali
  Knowledge City

Sector 81, S A S Nagar, Mohali
P O Manauli 140306

5 Research Advisory Committee

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- Dr. S Rath, NII Delhi
- Prof. H S Mani, CMI Chennai
- Prof. Rajendra Bhatia, ISI Delhi
- Prof. J S Bagla, Dean (R&D), IISER Mohali (Convenor)

6 Administration

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Dean Faculty	Prof. A K Bachhawat
Dean Academics	Dr. Chanchal Kumar
Dean Students	Prof. Arvind
Dean R&D	Prof. J S Bagla
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Assistant Registrar	Sh. Sandeep Ahlawat
Assistant Registrar (Stores)	Sh. Mukesh Kumar
Deputy Librarian	Dr. P Visakhi
Executive Engineer cum Estate Officer	Mr. Praveen Kumar Srivastava
Stores & Purchase Officer	Sh. Kulwant Singh
Honorary Counsellor	Mrs. Suguna Sathyamurthy
Counsellor	Ms. Yogeet Brar
Warden (Boys)	Dr. Arulananda Babu
Warden (Boys)	Dr. N G Prasad
Warden (Girls)	Dr. Anu Sabhlok
Warden (Girls)	Dr. Arunika Mukhopadhyay
Security Officer cum PRO	Sh. J N Ahuja

Medical Officer	Dr. Gurpreet Singh
Medical Consultant	Dr. S K Aggarwal
Lady Medical Consultant	Dr. Virpal J Singh
Advisor Landscape & Horticulture	Dr. J S Bilga
Scientific Officer	Dr. Paramdeep Singh Chandi
Assistant Engineer Electrical	Er. Atul Kadwal
Assistant Engineer Civil	Er. Rajeev Kumar

7 Academic Staff

7.1 Faculty

1. Prof. N Sathyamurthy (Professor, Chemistry)
   Research area: Molecular Reaction Dynamics and Potential Energy Surfaces

2. Prof. R Kapoor (Professor, Chemistry)
   Research area: Inorganic chemistry

3. Prof. C G Mahajan (Professor, Physics)
   Research area: Atomic/ Molecular Spectroscopy

4. Prof. Arvind (Professor, Physics)
   Research area: Quantum information theory, Quantum optics

5. Dr. Kavita Dorai (Associate Professor, Physics)
   Research area: Biomolecular NMR, Quantum computing

6. Dr. Sanjay Singh (Assistant Professor, Chemistry)
   Research area: Synthetic Inorganic and Organometallic Chemistry

7. Dr. Amit Kulshrestha (Assistant Professor, Mathematics)
   Research area: Quadratic forms, Central simple algebras and related structures

8. Dr. Sanjay Mandal (Associate Professor, Chemistry)
   Research area: Organometallic Chemistry, Nanomaterials, and X-ray Diffractometry

9. Dr. Chanchal Kumar (Associate Professor, Mathematics)
   Research area: Algebraic Geometry and Combinatorial Commutative Algebra

10. Dr. Ramandeep Singh Johal (Associate Professor, Physics)
    Research area: Statistical Physics, Thermodynamics and Quantum Theory

11. Dr. Samrat Ghosh (Assistant Professor, Chemistry)
    Research area: Materials chemistry

12. Dr. R Ramesh (Assistant Professor, Chemistry)
    Research area: Development of Solid-state NMR methods, Quantum mechanics

13. Dr. Lingaraj Sahu (Assistant Professor, Mathematics)
    Research area: Operator Theory, Operator Algebras

14. Dr. S Mukhopadhyay (Assistant Professor, Biology/Chemistry)
    Research area: Protein folding, Misfolding, Prion & Amyloid biology

15. Dr. N G Prasad (Assistant Professor, Biology)
    Research area: Evolutionary genetics

16. Dr. S Arulananda Babu (Assistant Professor, Chemistry)
    Research area: Synthetic organic chemistry

17. Dr. A Mukhopadhaya (Assistant Professor, Biology)
    Research area: Immunology

18. Dr. K Chattopadhyay (Assistant Professor, Biology)
    Research area: Structure-Function Studies on Pore-Forming Protein Toxins

19. Dr. Rajeev Kapri (Assistant Professor, Physics)
    Research area: Statistical Mechanics

20. Dr. Lolitika Mandal (Assistant Professor, Biology)
    Research area: Hematopoiesis, Cardiogenesis and Molecular pathways in stem and progenitor cell development in Drosophila.

21. Dr. Sudip Mandal (Assistant Professor, Biology)
    Research area: Mitochondrial regulation of cellular function

22. Dr. Kamal P Singh (Assistant Professor, Physics)
    Research area: Ultrafast Quantum Dynamics and Stochastic nonlinear dynamics

23. Dr. Pranaw Rungta (Assistant Professor, Physics)
    Research area: Quantum Information and Computation

24. Dr. Angshuman Roy Choudhury (Assistant Professor, Chemistry)
    Research area: X-ray Crystallography

25. Dr. K P Yogendran (Assistant Professor, Physics)
    Research area: Quantum aspects of Gravity

26. Dr. R Vijaya Anand (Assistant Professor, Chemistry)
    Research area: Synthetic organic chemistry

27. Prof. Kapil Hari Paranjape (Professor, Mathematics)
    Research area: Geometry

28. Prof. Sudeshna Sinha (Professor, Physics)
    Research area: Nonlinear Dynamics, Chaos, Complex Systems, Networks, Computation

29. Dr. Anu Sabhlok (Assistant Professor, Humanities)
    Research area: Postcolonial studies, feminist geography, Political-economy of contemporary India, Globalization , Identity (gender and nation), Participatory Action Research, Ethnography

30. Dr. Samarjit Bhattacharyya (Assistant Professor, Biology)
    Research area: Neurobiology

31. Dr. Ananth Venkatesan (Assistant Professor, Physics)
    Research area: Mesoscopic Electronic & Electromechanical systems

32. Prof. Jasjeet Singh Bagla (Professor, Physics)
    Research area: Cosmology, Astrophysics

33. Dr. Krishnendu Gongopadhyay (Assistant Professor, Mathematics)
    Research area: Groups, Geometry & Dynamics

34. Dr. Vinayak Sinha (Assistant Professor, Earth Sciences & Chemistry)
    Research area: Environmental Science: Atmospheric Chemistry Field Experiments

35. Prof. Anand K Bachhawat (Professor, Biology)
    Research area: Glutathione and Sulphur Metabolism in Yeasts

36. Prof. Purnananda Guptasarma (Professor, Biology)
    Research area: Protein Engineering & Structural Biochemistry

37. Dr. Sanjeev Kumar (Assistant Professor, Physics)
    Research area: Condensed Matter Theory: Correlated electron systems, disordered systems

38. Dr. Santanu Kumar Pal (Assistant Professor, Chemistry)
    Research area: Liquid Crystals, Interfacial Phenomena, Colloid and Gel Chemistry, Chemical and Biological Sensing, Nanoscale Science and Engineering

39. Dr. Yogesh Singh (Assistant Professor, Physics)
    Research area: Experimental Condensed Matter Physics

40. Dr. Harvinder Kaur Jassal (Assistant Professor, Physics)
    Research area: General Relativity and Cosmology

41. Dr. K R Shamasundar (Assistant Professor, Chemistry)
    Research area: Quantum Chemistry

42. Prof. Sudesh Kaur Khanduja (Professor, Mathematics)
    Research area: Valuation theory

43. Dr. Kavita Babu (Assistant Professor, Biology)
    Research Area: Neurobiology

44. Prof. K S Viswanathan (Professor, Chemistry)
    Research Area: Spectroscopy

45. Dr. S V Rama Sastry Sripada (Assistant Professor,Chemistry)
    Research Area: Synthetic Organic Chemistry

46. Dr. Baerbel Sinha (Assistant Professor,EES)
    Research Area: Environmental Science

47. Dr. Mahak Sharma (Assistant Professor, Biology)
    Research Area: Cell Biology

48. Prof. Somdatta Sinha (Professor, Biology)
    Research Area: Mathematical & Computational Biology

49. Dr. Yashonidhi Pandey (Assistant Professor, Mathematics)
    Research Area:

50. Dr.Rachna Chaba (Assistant Professor, Biology)
    Research Area: Bacterial Genetics and Physiology

51. Dr. Ram Kishor Yadav (Assistant Professor, Biology)
    Research Area: Plant Developmental Genetics

52. Dr. Shravan Kumar Mishra (Assistant Professor, Biology)
    Research Area: RNA Splicing

53. Dr. Mandip Singh (Assistant Professor, Physics)
    Research Area: Quantum Optics and Bose Einstein Condensation

54. Dr. Goutam Sheet (Assistant Professor, Physics)
    Research Area : Condensed Matter Physics and Scanning Probe Microscopy

55. Dr. Varadharaj Srinivasan Ravi (Assistant Professor, Mathematics)
    Research Area: Differential Algebra

56. Dr. Rajesh Ramachandran (Assistant Professor, Biology)
    Research Area: Cellular basis of tissue regeneration

57. Dr. Shashi Bhushan Pandit (Assistant Professor, Biology)
    Research Area : Computational structural biology legend-protein interactions metabolics

58. Dr. Kuljeet Singh Sandhu (Assistant Professor, Biology)
    Research Area: Systems Biology of Gene Regulation

59. Dr. Abhishek Chaudhuri (Assistant Professor, Physics)
    Research Area : Soft condensed matter physics

60. Dr. Alok Kumar Maharana (Assistant Professor, Mathematics)
    Research Area : Algebric Geometry

61. Dr. S. K. Arun Murthi (Assistant Professor, HSS)
    Resarch Area : Philosophy of science

7.2 Honorary Faculty

1. Prof. I B S Passi (Professor, Mathematics)
   Research area: Algebra

2. Prof. Ashok Sahni (Professor, Earth Sciences)
   Research area: Earth Sciences

3. Prof. Anil Kumar (Professor, Physics)
   Research area: NMR Spectroscopy

7.3 Visiting Faculty

1. Prof. T R Rao (Visiting Professor, Biology)

2. Prof. H L Vasudeva (Visiting Professor, Mathematics)

3. Prof. K K Sharma (Visiting Professor, Physics)

4. Dr. Meera Nanda (Visiting Faculty, History & Philosophy of Science)

5. Dr. Adrene Freeda D'cruz (Visiting Faculty, English Literature)

7.4 Adjunct Faculty

1. Dr. Girish Sahni (Biology), Director, IMTECH, Chandigarh

2. Dr. Jagdeep Singh (Biology), Punjab Government

3. Dr. S A Ramakrishna (Physics), Associate Professor, IIT Kanpur

4. Prof. Dhruv Raina (Social Science), Professor, JNU, New Delhi

5. Prof. Amitabh Joshi (Biology), Professor, JNCASR, Bangalore

6. Dr. Rakesh Tuli (Biology), Executive Director, NABI Mohali
7. Dr. Amitabha Chattopadhyay (Biology), Deputy Director, CCMB Hyderabad
8. Prof. Abhay Bhat, Mathematics, ISI New Delhi
9. Prof. V Arvind, Mathematics, IMSc, Chennai
10. Dr. Arvinder Singh Sandhu, Physics, University of Arizona,Tucson AZ, USA
11. Dr. Sundar Sarukkai, Philosophy Humanities, Manipal University, Manipal
12. Prof. Rajendra Bhatia, Mathematics, ISI New Delhi

7.5 INSPIRE Faculty Fellows

1. Dr. Mahender Singh

8 Events: 2012-13

- **Convocation**. The first convocation of the institute was held on July 25, 2012. A detailed report is given below.
- **Independence day** (August 15 2012) was celebrated at IISER Mohali's new campus. The CNR Rao Foundation award was given to Ms. Diksha Jain. Academic excellence award was given to Ms. Tanya Kaushal. The certificate of merit for best performance in third and fourth year was given to Mr. Mayank Chugh, Ms. Srishti Batra, Mr. Agatsya Bhati, Mr. Deepak Verma, Ms. Indu Verma, Mr. Sudeep Maheshwari, Mr. Debdatta Sinha Roy, Mr. Nilmani Singh, Mr. Kapil Dave, Mr. Sumit Mittal and Mr. Keshav Aggarwal.
- **Foundation Day**. IISER Mohali Foundation Day was celebrated on 27th September 2012. A detailed report is given below.
- **Inauguration of the NKN facility:** Inauguration of the NKN facility at IISER Mohali by Dr. R. Chidambaram (Principal Scientific Adviser, Govt. of India) took place on October 15, 2012. Dr. Chidambaram delivered a lecture on the occasion titled *Need to work on difficult problems*. IISER Mohali has established an E-classroom under the National Knowledge Network (NKN). This is a state of the art facility, where the 1Gbps NKN cyber way will be used to share resources in realtime across the NKN network which includes a large number of educational institutions nationwide. The E-classroom has 65 all-in-one machines which are being used for various computer-oriented courses in the institute.
- **Republic Day** was celebrated on Jan 26, 2013. The CNR Rao foundation award was shared by Ms. Satavisa Jana, Ms. Ayush, Ms. Mishty Ray and Ms. Shruthi Ravindranath. The academic excellence awards was given to Ms. Saumya Gupta and Ms. Diksha Jain. The certificate of merit was given to Mr. Kshitiz Mohan, Ms. Nidhi Kaihnsa, Ms. Prerna Paliwal, Mr. Ankur Kumar Gupta, Ms. Debanjana Kundu, Mr. Sumit Chandra Mishra, Ms. Tanya Kaushal, Mr. Samant Manas Arun, Mr. Pushkal Srivastava, Mr. Aaveg Aggarwal, Ms. Anjali Gupta, Mr. Mayank Chugh, Ms. Kritika Singhal and Ms. Soniya Sharma.

8.1 Meetings of the Institute Bodies

During 2012-2013, various administrative bodies of the Institute met for deliberations.

Board of Governors Meeting

13^{th} meeting of BOG	:	25/07/2012
14^{th} meeting of BOG	:	18/01/2013

Finance Board Meeting

11^{th} meeting of the Finance Board	:	25/07/2012
12^{th} meeting of the Finance Board	:	18/01/2013

Academic Senate Meeting

11^{th} meeting of Academic Senate	:	15/05/2012
12^{th} meeting of Academic Senate	:	24/12/2012

Research Advisory Committee Meeting

5^{th} meeting of Research Advisory Committee	:	18/03/2012

8.2 Convocation

The first convocation of the Indian Institute of Science Education and Research (IISER) Mohali was held on July 25, 2012. The first batch of 26 students in the BS-MS dual degree program from the institute graduated and were awarded degrees.

The convocation was held in the lecture hall complex at the 125 acre campus of IISER Mohali located in the Knowledge city, Mohali. Shri Kapil Sibal, honourable minister for Human Resource Development inaugrated the lecture hall complex at IISER Mohali before the convocation ceremony. Prof. R. A. Mashelkar, chairman of the board of governers of IISER Mohali presided over the convocation ceremony. Prof. C. N. R. Rao, chairman, scientific advisory council to the Prime Minister was the guest of honour. An honorary doctorate was conferred upon Prof. C. N. R. Rao. Directors of all the five IISERs were present at the ceremony as this was the first convocation hosted by an IISER.

The gold medal was awarded to Mr. Rishi Raj Trivedi for best academic performance. The S. N. Kaul award for best all round performance, including extra-curricular activities was given to Ms. Amita Agrawal.

8.3 Foundation Day Celebrations

The seventh Foundation Day of IISER Mohali was celebrated on September 27, 2012 in the lecture hall. The foundation day lecture was given by Dr. T. Ramasami (DST). Speaking on *Expanding excellence in science education and research*, Dr. Ramasami discussed the various initiatives and schemes that are leading to a transformation in the contribution of universities and colleges to research in sciences. By using a distributed approach where allocation of funds is not limited to a small number of institutes or departments, these schemes have led to growth in all parts of the country. Dr. Ramasami also discussed some new schemes that are being considered. The lecture was followed by interaction with students and faculty members at the institute.

8.4 Session on Nobel prizes

A session on Nobel prizes for the year 2012 was organized at IISER Mohali on October 17, 2012. The following talks were organized.

- **Dr. Ram Yadav**: *The Medicine prize*
- **Dr. Kausik Chattopadhyay**: *The Chemistry prize*
- **Dr. Mandip Singh**: *The Physics prize*

8.5 Celebration of Science Day

Science Day was celebrated this year on February 28, 2013 with a program organized by our students for the school students of the region. The program was coordinated by the Outreach Centre of the institute. Around 200 school children from the region participated in the program and this time the program was advertised in newspapers to expand the basin of attraction to schools of the region and not just the tricity area. The program took place in the lecture hall complex and a variety of events were organized. Dr. N. G. Prasad was the overall coordinator and was ably aided by several faculty members including Prof. Viswanathan, Dr. Mandip Singh, Dr. Abhishek Chaudhuri, Dr. Vijay Anand, Dr. Amit Kulshreshta and Dr. Rajesh Ramachandran, Prof. I. B. S. Passi, Dr. Anu Sabhlok, Prof. J. S. Bagla, Prof. T. R. Rao, Prof. Arvind and Dr. Vinayak Sinha. Dr. Sanjay Mandal, Dr. Kavita Dorai and Dr. Samrat Mukhopadhyay helped in showing the visitors around the various research facilities in CAF. A stimulating science quiz which also included a component for citizens was organized. The programme also involved taking the school students through demonstrations of experiments in various science laboratories of the Institute. There were several demonstrations aimed at a younger target audience. An open session of school students with scientists from IISER Mohali was organized where questions from students were answered by the faculty.

9 Meetings/Conferences/Workshops organized

- **Engaging Science: Dialogues across disciplines:** This meeting was held at IISER Mohali from March 31 - April 1, 2012. This meeting initiated a dialogue with the academic community to explore the intersections of science, technology and society. The idea was to expand the notion of merely 'doing science' at IISER Mohali to one of understanding, thinking about and interrogating the various facets of scientific knowledge production as they intersect with human life. How do developments in Science and technology shape human life and environment? How do human values reflect the nature of research in science and technology? Do arts and sciences actually inhabit two different worlds or are there overlaps? What are the social and psychological impacts of our increased engagement with technology? How has the history of science shaped world history and vice-versa? In the shaping of working scientists and their world view what role do the humanities and social sciences play? This two day conference will engage with questions that lie at the interface of science and society. Prof. Dhruv Raina,JNU Delhi; Prof. Sundar Sarukkai, Manipal University; Prof. A.P. Shukla, IIT Kanpur; Prof. P.R.K. Rao,IIIT Hydrabad; Prof. T. Jayaraman, TISS Mumbai and Prof. Nagarjuna, HBCSE, Mumbai gave invited talks. In addition, a call for abstracts was advertised. 10 scholars were selected to present their papers.

- **KVPY Camp:** KVPY Summer Camp at IISER Mohali was organized during May 21-26, 2012. In this camp more than 100 KVPY scholars from all over the country spent a week at IISER Mohali learning about science through lectures, demonstrations and experiments.

  The talks were organized so as to expose the KVPY scholars to a variety of themes including social sciences. The camp was inaugurated by Director IISER Mohali Prof. N. Sathyamurthy and the KVPY national convener Prof. Chandrasekaran delivered the first lecture on *Greening the Chemistry Curriculum*. The speakers were chosen from diverse fields of science and social science and included Dr. Sandeep Sahijpal (Panjab University Chandigarh), Dr. Gopal Srinivasan (IIT-Bombay), Dr. Rahul Siddharthan (IMSc Chennai), Dr. Anantha Ramakrishna (IIT Kanpur), Dr. Ganeshaiah (GKVK Bangalore), Dr. Anish Dua (GNDU Amritsar) and Dr. Ravi Chand Singh (GNDU Amritsar). Faculty members from IISER Mohali who delivered lectures during the camp included Prof. Jasjeet Singh Bagla, Prof. Somdatta Sinha, Dr. Arunkia Mukhopadhaya, Dr. Mandip Singh, Dr. Sanjay Mandal, Dr. Amit Kulshrestha, Dr. Vinayak Sinha, Dr. Anu Sablok and Prof. S. K. Khanduja.

  The entire IISER faculty played a crucial role by volunteering in various capacities. The chemistry demonstrations were organized by Dr. S. A. Babu, Dr. R. Vijay Anand, Dr. S. V. Rama Sastry Sripada and Dr. K. R. Shamasundar. The biology demonstrations were organized by Dr. Mahak Sharma and Dr. Kavita Babu. The physics demonstrations were organized by Dr. Mandip Singh, Dr. R. S. Johal and Dr. Sanjeev Kumar. The mathematics demonstrations were organized by Dr. Mahender Singh and Dr. Yashonidhi Pandey. Dr. Kavita Dorai, Dr. Sanjay Mandal and Dr. Samrat Mukhopadhyay organized student visits to research facilities in CAF. The overall camp organization was coordinated by Dr. N. G. Prasad. IISER Mohali student volunteers participated in a big way in the organization of this camp and in particular in the process of showing science demonstrations to the KVPY scholars. They were guided by the faculty and the demonstrations were organized by the Outreach Centre of the Institute.

- **Inauguration of the NKN E-Classroom:** An NKN e-classroom has been set up at IISER Mohali and it was inaugurated by Prof. R. Chidambaram on Oct.15, 2012. The e-classroom has connectivity on the NKN network and this allows seemless interactive sessions with any one or more academic or research institutes on the network. The e-classroom is being used for joint courses where a teacher from one such institute teaches students in more than one IISER. The e-classroom also serves as laboratory for courses related to computational sciences.

- **Discussion Meeting on Ooty Radio Telescope Upgrade:** A meeting to discuss the ongoing upgrade of the Ooty radio telescope and the science potential of the upgraded telescope was help at IISER Mohali on July 3-5, 2012. Prof. C. R.

Subramanya (RRI, Bangalore), Prof. Jayaram Chengalur (NCRA-TIFR, Pune), Prof. Uday Shankar (RRI, Bangalore), Prof. P. K. Manoharan (Radio Astronomy Centre, Ooty), Mr. Abhik Ghosh (IIT Kharagpur), Mr. V. R. Marthi (NCRA-TIFR, Pune) and Prof. J. S. Bagla attended the meeting and made presentations. Some presentations were also made via a remote video link. Prof. J. S. Bagla organized the discussion meeting.

- **Astronomy Olympiad Nurture Camp:** Astronomy Nurture Camp 2012 was organised by Homi Bhabha Centre for Science Education at IISER Mohali during December 10-21, 2012. The camp is meant primarily for students who participate in the astronomy olympiad preparation camps to continue their engagement with astronomy. A total of 19 students participated in this camp, including four students from IISER Mohali. Dr. H. K. Jassal was the covenor of the organising committee. Students were divided into four groups which worked on different Astronomy projects. Each project had a designated mentor/supervisor. The four projects and the project supervisers are listed below:

  1. *Large Scale Structure of the Universe* with Prof. J. S. Bagla.
  2. *Constraining dark energy using supernova data* with Dr. H. K. Jassal.
  3. *Estimating photometric redshift using machine learning techniques* with Dr. Ninan Sajeeth Philip (St. Thomas College, Kozhencheri).
  4. *Parametric Study of Low-Redshift Galaxies Using SDSS-III* with Dr. Sivarani Thirupathi (IIA, Bangalore).

  The camp concluded with presentations by all the participants about the projects. Dr. Aniket Sule (HBCSE) and Prof. Mayank Vahia (TIFR) also helped with the conduct of the camp and evaluation of the projects.

10 Library

The Library of IISER Mohali is a unique place with its rich collection of monographs and Journals in Mathematics, Physics, Chemistry, Biology, Computer Science, Humanities, Earth/Environmental Science, Astrophysics etc., The collection includes textbooks for the UG & PG courses in the basic sciences as well as applied sciences. The house keeping activities of Library is operating through Open Source Library Management Software *Koha*. The library at IISER Mohali currently added more than 2000 books during the period.

Apart from above Journals, the IISER Mohali being one of the core members of INDEST has seamless access to thousands of electronic journals in the field of basic sciences.

Library hosted 5th inter-IISER Library Consortium meet during July 20-21, 2012 with participation of librarians from all five IISERs. New version of Open source library management Software 3.4 with newly designed OPAC as well as Library website was launched by Prof. N. Satyamurthy, Director, IISER Mohali in inagural session of IISER Consortium meet on 20th July 2012.

11 Research and related activities

11.1 Research Publications

1. S. Srivastava, **N. Sathyamurthy** and A. J. C. Varandas, *An accurate ab initio potential energy curve and vibrational bound states for the $X^2\Sigma_u^+$ state of H_2^-*, Chem. Phys. 398 (2012) 160-167.

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3. M. Majumder, **N. Sathyamurthy**, H. Lefebvre-Brion and G J Vazquez, *Photoabsorption of carbon monoxide: a time-dependent quantum mechanical study*, J. Phys. B: At. Mol. Opt. Phys. 45 (2012) 185101

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78. **Pushpender K Sharma**, Vinodh Kumar and Jagdeep Kaur, *Common Methods Employed in Directed Evolution and Their Application in Modification of Lipases*, Research Journal of Pharmaceutical, Biological and Chemical Sciences, 3 (3) (2012) 183-191.

79. Ashok Ajoy, Rama Koteswara Rao, Anil Kumar and **Pranaw Rungta**, *Algorithmic approach to simulate Hamiltonian dynamics and an NMR simulation of quantum state transfer*, Physical Review A - Atomic, Molecular, and Optical Physics, 85 (3) (2012) 030303.

80. P. Chingangbam, C. Park, **K. P. Yogendran** and R. van de Weygaert, *Hot and Cold Spot Counts as Probes of Non-Gaussianity in the Cosmic Microwave Background*, Astroph. Journ. 755 (2012) 122.

81. **Biplob Nandy**[1], *Self Sensing Solar Panel Using 555 IC*, Noto-are Electronics 10527835 (2013).

82. **Biplob Nandy**[1], *High Speed Static Circuit Breaker*, Noto-are Electronics 11625467 (2012).

[1] BS-MS student.

11.2 Patents

- Dr. S. Arulananda Babu filed the following patents.
  - *Preparation of new crown ether/polyether macrocyclic systems*, Inventors: Dr. Srinivasarao Arulananda Babu and Naveen, Assignee: Indian Institute of Science Education and Research (IISER) Mohali, Knowledge City, Sector 81, SAS Nagar, Mohali, Manauli P.O., Punjab, 140306, India. Application No.: 3532/DEL/2012, Filing Date: 16th Nov 2012
  - *A stereoselective method for the preparation of β-alkyl N-substituted aspartic acid derivatives*, Inventors: Dr. Srinivasarao Arulananda Babu and Nayyar Ahmad Aslam, Assignee: Indian Institute of Science Education and Research (IISER) Mohali, Knowledge City, Sector 81, SAS Nagar, Mohali, Manauli P.O., Punjab, 140306, India. Application No.: 295/DEL/2013, Filing Date: 2 February 2013.

11.3 Guided Research

- **Prof. S. K. Khanduja:** Mr. Anuj Bishnoi obtained Ph.D. from Panjab University, Chandigarh, for work done under the supervision of Prof. Khanduja.

11.4 Awards & Honors

- **Prof. N Sathyamurthy:**
  - Reappointed Editor, European Journal of Physics D 2013-2015.
  - Chairman, Programme Advisory Committee in Physical Chemistry, SERB, DST.
  - Member, Scientific Advisory Committee to the Cabinet, Govt. of India.
- **Prof. Kapil Paranjape**
  - Academic Secretary of the Ramanujan Mathematical Society.
  - Member of the Programme Advisory Committee for Mathematical Sciences of the Science and Engineering Research Board constituted by the Department of Science and Technology.
  - Member of Editorial Board of the Indian Journal of Pure and Applied Mathematics. (New appointment this year.)
- **Dr. K. Gongopadhyay:**
  - Appointed adjunct faculty of the CEMS, Almora for the year 2012-14.

- **Prof. Sudeshna Sinha:**
  - Editor of "Chaos" (AIP)
  - Member of the Board of NBHM
  - Member of the DST - Programme Advisory Committee (PAC) for High energy, Plasma, Non linear dynamics
  - Member of the International Program Committee of the "International Scientific Conference on Physics and Control", to be held in Mexico. August, 2013
  - Co-convenor of the satellite conference to STATPHYS 2013 : "Perspectives in Nonlinear Dynamics (PNLD)", July 2013
- **Dr. Yogesh Singh:**
  - was a guest professor at the Georg-August-Universitat Goettingen, Germany during May 12th to July 30th.
- **Dr. Kavita Babu:**
  - Welcome-DBT Alliance Intermediate Fellowship
- **Dr. Rajesh Ramachandran:**
  - Welcome-DBT Alliance Intermediate Fellowship
- **Mr. Gaurav Verma:**
  - Best poster award in the conference 'Dr. R. C. Paul National Symposium on New Directions in Chemical Sciences' held at PU during Feb. 23-24, 2013.
- **Dr. Vinayak Sinha:**
  - Member of Scientific Advisory Committee (SAC) of Aryabhatta Research Institute of Observational Sciences (ARIES, DST funded), Nainital, India, since 2012
  - Scientific Advisory Board Member of Sankar Foundation Research Institute, Vishakhapatnam, A.P., India since October, 2010
  - Topical Editor in Atmospheric Chemistry and Physics for the journal Earth System Science Data, since November 2009
- **Dr Kavita Dorai:**
  - Was conferred the "Prof S. Subramanian 60th Birthday Lecture Award 2012" by the NMR Society of India.

- **Dr. Mahak Sharma:**
  - Awarded Fast Track grant from Department of Science and Technology, August 2012.
  - Awarded the "Wellcome Trust-DBT Alliance Intermediate Fellowship".
- **Dr. Shravan Kumar Mishra:**
  - Appointment as "Head of the partner group of the Max Planck Institute of Biochemistry at IISER Mohali".
- **Prof. J. S. Bagla:**
  - Has been appointed chairperson of the Giant Meterwave Radio Telescope (GMRT) time allocation committee for a period of three years starting May 2012. The committee is tasked with inviting proposals for using the GMRT for astronomical observations. The proposals are peer reviewed and the time allocation committee decides how to apportion telescope time amongst various proposals.
- **Dr. N. G. Prasad:**
  - Best teacher award at IISER Mohali.
- **Dr. Mahender Singh:**
  - DST Fast track fellowship.

11.5 Conferences & Invited Talks

- **Prof. N Sathyamurthy:**
  - Delivered a lecture on Pentagons and hexagons, Chennai Chemistry Conference 2013, CLRI, Chennai,Feb. 8, 2013
  - Delivered a lecture on Pentagons and hexagons, New Frontiers in Chemistry, Punjabi University,Patiala, Feb. 16, 2013
  - Delivered a lecture on Back to the basics: the case of diatomic anions, An international conference on electronic structure and dynamics of molecules and clusters, IACS, Kolkata, Feb. 17-20, 2013
  - Delivered a seminar on A Mirchi Story: Curiosity Driven Science, INSPIRE Camp, University of Jammu, January 20, 2013
  - Delivered a seminar on From our garden back to the Gondwana land, Science City, Kapurthala, Feb. 28, 2013

- Delivered a seminar on Bowls, balls and sheets: five and six-fold symmetry, Punjab University, March 2, 2013
- Delivered a seminar on Pentagons and hexagons in bowls, balls, sheets and flowers, IISER Bhopal,March 15, 2013
- Delivered a seminar on Pentagons and hexagons in bowls, balls, sheets,tubes and flowers, Chemistry Department, Mahatma Gandhi University, Kottayam, March 25, 2013

- **Prof Arvind:**
  - Delivered an invited talk in DST-INSPIRE camp at BBSBEC Fatehgarh Sahib on March 22, 2013.
  - Delivered an invited talk in DST-INSPIRE camp at BBSBEC Fatehgarh Sahib on February 13, 2013.
  - Delivered a set of three lectures on Quantum Information Processing as part of Popli Memorial Lecture Series at St. Stephen's College New Delhi Feb 7-9, 2013.
  - Delivered an invited talk in the International Conference on Quantum Information and Quantum Computing (ICQIQC) 7-11 January 2013
  - Delivered an invited talk in DST-INSPIRE camp at A.S. College Khanna, on December 23, 2012.
  - Delivered a set of lectures on Quantum Entanglement in the Summer School Programme of CQIQC, IISc, Bangalore during May 15-June 15 2012.

- **Prof Somdatta Sinha:**
  - Two inaugural lectures on Networks - a recurrent theme in biological systems in the school on "Networks in Biology, Social Science and Engineering" at the Indian Institute of Science, Bangalore, on July 2, 2012.
  - A lecture on *Complexity in Genomic Patterns and Classification*, at the National Conference on Nonlinear Systems & Dynamics, IISER Pune, Pune, July 12, 2012.
  - A lecture on *Modelling multi-cell systems* at the International Conference on Networks in Biology, Social Sciences and Engineering, Indian Institute of Science, Bangalore, July 13, 2012.
  - A lecture on *Modelling Biochemical Pathways*, organized by ISI Kolkata and Mizoram University at Aizawl, Mizoram, August 21, 2012.
  - Three lectures in the *INSA Year of Science* lecture series on i) *Introduction to Systems Biology*, Tripura Central University, Agartala, ii) *Modelling in Biology*, Women's College, Agartala, and iii) *Modelling in Biology*, Iswar Chandra Vidyasagar College, Belonia, South Tripura, during Aug 24-25, 2012.

- A lecture on *A Simple Approach to Study Common Designs in Biochemical Pathways*, University of Stavanger, Norway, October 26, 2012.
- A lecture on *Networks in Biology: An Overview* in Analysis of Biological Networks, IIT Guwahati, November 6, 2012.
- A lecture on *Deciphering Host-Pathogen Interactions from Whole Genome Analysis* in Indo-German Symposium on Systems Biology, University of Hyderabad, Hyderabad, November 27, 2012.
- Two lectures on *Visualising and Analysing Protein Structures Using Graphs* and Nonlinear Dynamics In Biochemical Pathways in DST - SERC School on Nonlinear Dynamics, S N Bose National Centre for Basic Sciences, Kolkata, December 20-21, 2012.
- Two lectures on *Modelling Biochemical Pathways* and *Analysis of Genomic Signatures for Classification of HIV-1 Genome*, Indian Statistical Institute, Kolkata, December 28, 2012 and January 3, 2013.
- A lecture on *Population dynamics of Drosophila* fitting a model to complex data, in Bayes by the Bay organized by Institute of Mathematical Sciences, Chennai at Pondicherry, January 5, 2013.
- A lecture on *Current Capacity for Infectious Disease Modelling in India and Future Prospects* in Application of Infectious Disease Modeling in Public Health Challenges and Opportunities for India, National Centre for Disease Control and Public Health Foundation of India, Delhi, February 7, 2013.
- A lecture on *Pathogen Classification & Evolution in silico studies of HIV-1 whole genome sequences* in Workshop on Infectious Diseases Pathogen Diversity: Exploiting Pathogen Genetics for New Control Strategies, at ICGEB, New Delhi, organised by Indian Council for Medical Research-International Centre for Genetic Engineering & Biotechnology-Public Health Foundation of India-London School of Hygiene and Tropical Medicine, March 6, 2013.
- A lecture on *Complexity in Genomic Patterns and Classification* in National Conference on "Mapping the 'Materials Genome" at Shiv Nadar University, Noida, March 9, 2013.

- **Dr. Krishnendu Gongopadhyay:**
  - Gave Mathematics Seminar at IIT Ropar on March 13, 2013.
  - Gave a lecture at a workshop on differential geometry held at TIFR-CAM on February 14, 2013.
  - Gave an invited section talk in the section "Algebraic and Differential Topology" at the Annual Conference of the Indian Mathematical Society, BHU, Varanasi during January 22-25, 2013.

- Gave two seminar talks at HRI during October-Nov, 2012.
- A seminar talk at the Dept of Mathematics and Statistics, Hyderabad Central University on September 6, 2012.
- Gave a guest lecture at an Advanced Instructional School (for college and university lecturers) at Delhi University on April 3, 2012.

- **Prof Sudeshna Sinha:**
  - Gave invited talk in *International Symposium on Innovative Mathematical Modelling*, Tokyo, Japan, 14-18 May 2012.

- **Dr. S.A Babu:**
  - Invited to attend The Complex Chemical Systems organized by IISER Bhopal, will held during Dec 3-5, 2012 and delivered a short talk entitled *Efforts toward stereoselective C-C bond formation, construction of small and complex bioactive molecules and synthetic building blocks.*

- **Dr. Yogesh Singh:**
  - Gave an invited talk titled *Spin-Orbit Mott Insulators: an Emerging Frontier* at the Helmholtz Zentrun Berlin, Germany.
  - Gave a series of lectures as part of a course titled *Magnetism* at the I. Physikalisches Institut, Georg-August-Universitat Goettingen, Germany.

- **Dr. Ram K Yadav:**
  - Delivered a lecture *How to unravel the functioning of plant apical meristem?* (Department of Bioinformatics at DAV College Chandigarh, 5th Feb. 2013)
  - Deliverd a lecture *Transcriptional repression in stem cell specification - Lessons from plant shoot apex* (Mini-Symposium on Frontiers in Plant Biology, IISER-NISER Plant Biology Faculty Satellite Meeting, IISER Pune, Jan 19th 2013)

- **Dr. Kavita Babu:**
  - Regional Centre for Biotechnology (RCB), Delhi (October, 2012): I was an instructor for a three day workshop on Eukaryotic Model Organisms. I was involved in teaching students how to work with C. elegans.
  - National Institute for Science, Education and Research (NISER), Bhubaneshwar (December, 2012): I was invited as a guest speaker for the 6th SERB School in Neuroscience. Here I gave two lectures of aspects of Developmental Neurobiology.

- **Dr. R. S. Johal:**

- Gave a contributed talk at International Workshop and Conference on Bayesian Theory and Applications, Jan. 06-10, 2013, Banaras Hindu University.

- **Dr. Alok Maharana:**
  - Gave a talk on "Special type affine surfaces" at IISER Pune, November 30, 2012.

- **Prof. I. B. S. Passi:**
  - Participated in the Workshop on Group Rings and Related Topics held at Universitaet Stuttgart (Germany) during 25 - 29 June 2012, and gave an invited talk entitled Idempotent Matrices over Group Rings.
  - Participated in the Workshop on Groups in Action held at Vercors (France) during 26 - 31 August 2012 and gave an invited talk entitled Simplicial Methods in Group Theor.
  - Gave a talk entitled Career Options for Students of Mathematic on 30 November 2012 at Panorama Science Centre Kurukshetra and on 11 December 2013 at Delhi Public School Sector 40 Chandigarh.
  - Participated in the National Conference on Recent Trends in Discrete and Fuzzy Mathematics held at DAV College Jalandhar (Punjab) during 2-3 February 2013 and gave a talk on Development of Mathematics in Punja

- **Dr. Vinayak Sinha:**
  - Presented an invited talk at the inception workshop of the International Centre for Integrated Mountain Development (ICIMOD), A UNEP Agency in Kathmandu, Nepal from 1–4 April, 2012
  - Presented a colloquium talk entitled *Atmospheric OH Reactivity measurements using the CRM technique and a new atmospheric chemistry facility in India for studying biosphere atmosphere exchange of VOCs* at Ecole Mines Douai, France on 22 June, 2012
  - Presented an invited lecture at Central Salt and Marine Chemicals Research Institute, Bhavnagar on 11 July, 2012
  - Presented invited lecture on *Proton Transfer Reaction Mass Spectrometry Applications* at the PTR–MS workshop and seminar organized by M/s Mars Bio– analytical and Ionicon Analytik held on 19 Oct, 2012 at Delhi Gave a lecture series on Mass Spectrometry at Sri Sathya Sai Institute of Higher learning, Prashanti Nilayam, Andhra Pradesh on 21st feb – 24 feb, 2013.
  - Gave an oral presentation at the International Global Atmospheric Chemistry (IGAC) conference held in Beijing from 15.09.2012 - 23.09.2012

- **Dr. Samrat Mukhopadhyay:**
  - International Symposium on Protein Folding and Dynamics held at NCBS, Bangalore in Oct 2012.
  - CCMB Hyderabad, September 2012.
  - BHU Varanasi, January 2013.
- **Dr. Santanu K Pal:**
  - Invited to deliver a talk in the 19th national conference on Liquid Crystals (NCLC-19), held during November 21-23, 2012 at Thapar University, Patiala.
- **Dr. Abhishek Chaudhury:**
  - Invited lecture at Inspire science camp organzied by Garhwal University on 26th January 2012.
  - Presented a poster at the Young Investigators Meeting (YIM) at Jodhpur, Rajasthan between Feb 9th and 14th, 2012.
- **Dr. S. V. Ram Sastry Sripada:**
  - Invited to attend the Indo-German conference on 'The Complex Chemical Systems' organized by IISER Bhopal, held during Dec 3-5, 2012 and delivered a talk entitled An Encounter with Furfuryl Cations
- **Dr. Sanjeev Kumar:**
  - A lecture on "Unconventional magnetic and electronic states in doped frustrated magnets" at the Institute of Physics, University of Augsburg, Germany, on July 4, 2012.
- **Dr. Rajeev Kapri:**
  - Invited Guest Lecture during in-service course of PGTs (Physics) at K. V. OCF, Sector 29, Chandigarh on January 04, 2013.
  - Invited talk at DST INSPIRE Science Camp on January 26, 2013 at HBN University Srinagar Garhwal.
- **Dr Kavita Dorai:**
  - Gave an invited talk at the conference "Engaging Science:Dialog across Disciplines", IISER Mohali, March 31-April 01 2012.
  - Gave an invited talk at the Review Meeting "Brainstorming about metabolomics", GKVK Bangalore May 12-13 2012.

- Gave an invited talk at the "19th National Magnetic Resonance Society Symposium", IIT Bombay February 3-6 2013.

- **Dr Rachna Chaba:**
  - Gave an invited talk at the 16th Transcription Meeting organized by the Indian Institute of Chemical Biology in Kolkata from 3-5 March, 2013.

- **Dr. Mahak Sharma:**
  - Invited for research seminar at the Department of Biological Sciences, Tata Institute of Fundamental Research (TIFR), Mumbai (July 2012).
  - Invited for talk at the Departments of Bioinformatics and Biotechnology, DAV College, Chandigarh on February 28th 2013.

- **Dr. R. Vijaya Anand:**
  - Delivered an invited research talk at NIPER Mohali on 13th April 2012
  - Participated in the 15th National Organic Symposium Trust Conference, which was at Agra during October 10-14, 2012.
  - Delivered a short oral presentation on my research in Indo-German conference organized by IISER Bhopal during Dec 3-5, 2012.

- **Prof. S. K. Khanduja:**
  - Delivered a lecture in The 31st Ohio State-Denison Mathematics Conference held from Friday, May 25th through Sunday, May 27, 2012 at The Ohio State University, Columbus, Ohio.
  - Visited and delivered a lecture in Center for Ring Theory and Applications, Ohio University, Athens in May-June, 2012.
  - Visited and delivered two lectures at Department of Mathematics and Statistics, Wright State University, Dayton in June 2012.
  - Delivered a lecture at Department Math, University of Pennsylvania, Philadelphia in June 2012.
  - Delivered eight lectures in the Advanced Insructional School in Algebra held in IISER Mohali during July 3, 2012 to July 21, 2012.
  - Delivered a lecture in the International conference on history and development of Mathematical sciences held at MDU Rohtak during November 21-24, 2012.
  - Delivered a lecture in the 21st International conference on Interdisciplinary Mathematics, Statistics and Computational Techniques held at the department of Statistics, Panjab University Chandigarh from December 15-17, 2012.

- A public lecture and colloquium at SRTM University, Nanded (Maharashtra) during March 14-16, 2013.

- **Dr. H. K. Jassal:**
  - Gave a lecture on Introduction to Cosmology at Astronomy Olympiad Cum Selection Camp, HBCSE, Mumbai, May 6, 2012.

- **Prof. J. S. Bagla:**
  - Lectures on *Distance Measurement in Astronomy*, *History of the Universe* at the Astronomy Olympiad preparation and selection camp, HBCSE, Mumbai on May 8, 2012.
  - Seminar on *Hyperfine transition of ^{3}He II as a probe of the epoch of reionization* at the Raman Research Institute, Bangalore on March 18, 2012.
  - Seminar on *Forming galaxies in dark matter halos* at the Indian Institute of Astrophysics, Bangalore on March 23, 2012.
  - Popular lecture on *History of the Universe* at the Nehru Planetarium, Bangalore on March 24, 2012.
  - Public lecture on *Transit of Venus* at Gaity theatre, Simla on June 6, 2012.
  - Lecture on *Cosmology and Particle Physics* at the SPSTI, Panchkula on Aug.4, 2012.
  - Lecture on *Cosmology and Particle Physics* at DAV College, Sector 10, Chandigarh on Aug. 27, 2012.
  - Lecture on *Cosmology and Particle Physics* at the Semiconductor Physics Laboratory on Nov. 5, 2012.
  - Lecture on *History of the Universe* at INSPIRE Camp, held at GHG Khalsa College, Gurusar, Sadhar on Dec. 27, 2012.
  - Two lectures on *Structure formation constraints on cosmological parameters* at a workshop on Present observational constraints on cosmological parameters, held at Delhi University during Jan. 28 – Feb. 1, 2013. These lectures were given via a video link.
  - A talk on *Cold gas at high redshifts* at the meeting of the Astronomical Society of India held at Thiruvananthapuram during Feb. 20–22, 2013.
  - Lecture on *Clusters of Galaxies* at the 1st IAPT National Student Symposium on Physics, Panjab University, Feb. 27, 2013.

- **Prof. P. Guptasarma:**
  - *Transplanting active surfaces amongst proteins through protein engineering* at CCMB Hyderabad on May 22, 2012.

- *Protein engineering* at the seminar on recent techniques in Biotechnology, Panjab University, Department of Biotechnology on Sep. 15, 2012.
- *Peptide bond fluorescence: The discovery and its biological implications and applications* at the Guha Research Conference, NEHU, Shillong on Nov 30, 2012.
- *The discovery of a fourth fluorescence in proteins* at National Institute of Immunology, New Delhi on Feb. 15, 2013.
- *Understanding the hyper-thermal structural stability of two Pyrococcus furiosus proteins : rubredoxin (PfRD), and triosephosphate isomerase (PfuTIM)* at the Symposium *Ramachandran Manifestation : Peptide to Proteome*, University of Delhi South Campus, Department of Biochemistry on March 15, 2013.
- *Mass spectrometry in the service of protein biochemistry* at the Symposium on *Recent Techniques in Biochemistry*, Punjab University, Department of Biochemistry on March 23, 2013.

- **Prof. N. G. Prasad:**
  - A talk at the Prof. M. K. Chandrasekharan Memorial Symposium at JNCASR, Bangalore, 9-11th January, 2013.
  - Selected as Kavli Fellow to present a talk at the Kavli Foundation Frontiers of Science meeting organized by Indo-USSTF and Kavli Foundation at Agra, India.

- **Prof. A. K. Bachhawat:**
  - *A proapoptotic protein involved in cytosolic glutathione degradation in yeasts* at the International meeting of Yeast Apoptosis, Rome, Italy, September 16-20, 2013.
  - *Glutathione Degradation : Discovering new pathways from yeast* at the Workshop on Model Organisms at the Regional Centre for Biotechnology, Gurgaon on October 15, 2012.
  - *Understanding the biochemical basis of the pathophysiology of Cystinosis* in the CME on Molecular basis of genetic diseases at the Post-Graduate Institute of Medical Education and Research, Chandigarh, December 22-23, 2012.
  - *Glutathione Degradation : Discovering new pathways from yeast* at University of Hyderabad, 18th February, 2013
  - *Apoptosis and Glutathione: The discovery of a missing link* at the Department of Microbiology, University of Calcutta, Kolkata, March 14-15, 2013.

- *A pro-apoptotic protein involved in glutathione degradation in yeast and mammals* at the *Genomeet 2013: Vitamin B12 and one carbon metabolism in complex diseases* at CSIR- Institute of Genomics and Integrative Biology, New Delhi held from March 8-10, 2013.

11.6 Faculty Visits

- Prof. Somdatta Sinha
  - Centre for Organelle Research, University of Stavanger, Stavanger, Norway (October 22-27, 2012)
  - Machine Intelligence Unit, Indian Statistical Institute, Kolkata, West Bengal (December 26, 2012 - Jan 3, 2013)

  Prof. Kapil Paranjape visited:
  - Stanford University, 26-27 May 2012, for "Young Researcher's Meet" to give a talk on "Mathematics at the IISERs."
  - IISc, Bangalore, 1-3 December 2012, for a conference to honour Prof. M.S. Narasimhan and give a talk on on "Abelian Surfaces with Real Multiplication".
- Dr. Krishnendu Gongopadhyay visited:
  - Delhi University, Delhi, during April 3–4, 2012.
  - Center of Excellence in Mathematical Sciences (CEMS), Almora during April 5–7, 2012 and October 4-6, 2012.
  - Hyderabad Central University during September 2-6, 2012.
  - HRI, Allahabad, during October 22–Nov 5, 2012.
  - CEMS, Almora during Dec 3-16, 2012.
  - Benaras Hindu University, Varanasi during January 23-25, 2013.
  - TIFR-CAM, Bangalore during February 10-14, 2013.
  - IIT Ropar, March 13, 2013.
- Prof Sudeshna Sinha visited:
  - Potsdam Institute for Climate Impact Research, Germany (11 – 17 June 2012).
  - Invited talk in "International Conference on Complex Processes in Plasmas and Nonlinear Dynamical Systems", 6-9 November 2012, Gandhinagar.

  - Two special lectures in DST SERC school on 21 Dec 2012, Kolkata.

- Dr. Lingaraj Sahu visited:

  - University of Goa for "INTERNATIONAL CONFERENCE ON OPERATOR ALGEBRAS IN NON-EQUILIBRIUM STATISTICAL MECHANICS" from December 17-21, 2012

- Dr. S. A. Babu visited:

  - Invited to attend The XV Organic Chemistry Conference organized by NOST, held during October 10-14, 2012 at Jaypee Palace Hotel at Agra.

- Dr. Yashonidhi Pandey visited:

  - Chennai Mathematical Institute, during June 1-6, 2012.
  - Tata Institute of Fundamental Research, Banglore Centre for two weeks in June.
  - Almora Mathematical Surveys, Almora October 3-6, 2012.
  - Kumaon University for 3 days in October 2012.
  - Conference in Group theory, Kumaun University, Almora (Uttarakhand), December 2012 for 3 days.

- Dr. Yogesh Singh visited:

  - University of Goettingen during May 12th to July 30th.

- Dr. Kavita Babu visited:

  - Regional Centre for Biotechnology (RCB), Delhi (October, 2012): I was an instructor for a three day workshop on Eukaryotic Model Organisms. I was involved in teaching students how to work with C. elegans.
  - National Institute for Science, Education and Research (NISER), Bhubaneshwar (December, 2012): I was invited as a guest speaker for the 6th SERB School in Neuroscience. Here I gave two lectures of aspects of Developmental Neurobiology.

- Dr. Alok Maharana visited:

  - IISER Pune, during November 25 to December 2, 2012.

- Prof. I. B. S Passi visited:

  - Visited Georg-August-Universitat Göttingen (Germany) as Guest Professor during April - October 2012 and gave a course on Group Rings during the Summer Semester.
  - Was a Guest of Honour at International Conference on History and Development of Mathematical Sciences held at M.D. University Rohtak during October 21-24, 2012.
  - Chaired, on February 22, 2013, the inaugural session of the Colloquium in Mathematics in the Thrust Areas of Algebra, Number Theory and Applied Mathematics organized by Department of Mathematics, Panjab University Chandigarh.

- Dr. Vinayak Sinha:
  - Visiting Professor at the Department of Chemistry and Environment in Ecole Mines Douai, France from June 1– 27, 2012
  - Research visit to Max Planck Institute for Chemistry, Mainz, Germany, from May 24-31, 2012 and June 28–July 5, 2012
  - Visit to Aryabhatta Research Institute of Observational Sciences as expert member of ARIES Research Advisory Committee (RAC) in Nainital on October 5–8, 2012

- Dr. Ram Sastry Sripada:
  - Attended The XV NOST Conference in Organic Chemistry held during October 10-14, 2012 at Jaypee Palace Hotel at Agra.
  - Attended Catalyst-2013 conference held during January 9-10, 2013 at Dr. Reddy's Research Foundation, Hyderabad

- Dr. Sanjeev Kumar visited:
  - IFW Dresden, Germany, during June 01 – July 30, 2012.
  - Institute of Physics, University of Augsburg, Germany, July 03-07, 2012.

- Dr. Mahak Sharma visited:
  - May 2012: Visit to AERB / BARC Mumbai for training on radiation safety to serve as radiological safety officer at IISER Mohali.
  - June 2012: IISER / NISER joint meeting in Pune to explore possibilities of inter-institutional collaborative research.

- Dr. S. A. Babu visited:

  - Invited to attend The XV Organic Chemistry Conference organized by NOST, held during October 10-14, 2012 at Jaypee Palace Hotel at Agra.

- Dr. B. Sinha:
  - Max Planck Institute for Chemistry, Department of Particle Chemistry, Mainz, Germany, during May 9–12, 2012.

- Prof. S. K. Khanduja
  - Attended the 31st Ohio State-Denison Mathematics Conference held from Friday, May 25th through Sunday, May 27, 2012 at The Ohio State University, Columbus, Ohio.
  - The Advanced Insructional School in Algebra held in IISER Mohali during July 3, 2012 to July 21, 2012.
  - The International conference on history and development of Mathematical sciences held at MDU Rohtak during November 21-24, 2012.
  - The 21st International conference on Interdisciplinary Mathematics, Statistics and Computational Techniques held at the department of Statistics, Panjab University Chandigarh from December 15-17, 2012.
  - Chaired a session in the International conference "The Legacy of Srinivasa Ramanujan" held at University of Delhi from December 17-22, 2012.
  - SRTM University, Nanded (Maharashtra) during March 14-16, 2013.

- Dr. H. K. Jassal
  - Homi Bhabha Centre for Science Education, Mumbai, during May 5–7, 2012.
  - Raman Research Institute, Bangalore, during May 16–25, 2012.
  - IUCAA, Pune, during July 6–17, 2012.

- Prof. J. S. Bagla
  - Homi Bhabha Centre for Science Education, Mumbai, during May 7–9, 2012.
  - Raman Research Institute, Bangalore, during May 16–25, 2012.
  - IUCAA, Pune, during July 6–17, 2012.
  - Meeting of the Astronomical Society of India, Thiruvanathapuram, during Feb.20–22, 2013.
  - Radio Astronomy Center, Ooty, during March 22-26, 2013.

- Dr. Mahender Singh[2]

[2]INSPIRE Faculty Fellow.

- University of Sao Paulo, Sao Paulo, Brazil, 29 July - 03 August 2012.
- CEMS Kumaon University, Almora, 03-16 December 2012.

12 Major Equipment Purchased

- Thin film deposition facility.
- Extended cavity diode lasers @ 780 nm, line width = 100 kHz.
- UHV Ion pump.
- High temperature furnaces (2),
- weighing balances.
- DSC equipment
- TGA instrument
- U V-Vis spectrophotometer with low temperature capability
- HPLC system
- Microwave synthesizer
- Flash Chromatography system
- PCR machine
- Electroporator
- -80°C Freezer
- Plant growth chambers
- Inverted microscope to view C. elegans for injections
- Steriomicroscopes (3)
- Fluorescence Steriomicroscope
- Upright Fluorescence and DIC microscope
- C. elegans injection set-up
- Thermocycler
- PCR thermal cycler

- Cryo-freezer
- Gas calibration unit (GCU) from Ionimed Analytik, Austria for ppb level humidity based VOC calibrations.
- Time-resolved fluorescence spectrometer
- Flowstart Evo Microreactor
- Biotage Flash Chromatography unit
- High Performance Liquid Chromatography System

13 Ongoing projects at IISER Mohali

Title	Principal Investigator	Funding Agency	Duration	Amount (Sanctioned)[3]	Amount (Received)[4]
Bio-molecular Solid-State NMR — Theory, Experiments and Application	**Dr. Ramesh Ramachandran**	DST	2009-12	34.80	19.72
Synthesis, structure, and spectroscopic studies of low valent late transition metal complexes with N-arylimidoylamidine and other neutral chelating ligands	**Dr. Sanjay Singh**	DST	2009-12	19.95	14.00
Synthesis, characterization and aggregation studies on prion octapeptide and its covalently-linked oligomers	**Dr. Mily Bhattacharya**	DST	2010-13	22.08	15.23
Co-crystallization of active pharmaceutical ingredients: Pathway for enhanced properties	**Dr. Angshuman Roy Choudhary**	DST	2009-12	19.31	10.41
Studies on organometallic based stereoselective noncarbohydrate synthetic strategies towards stereodivergent iminosugars,	**Dr. S Arulananda Babu**	DST	2010-13	19.75	15.00

[3]In Lakh INR.
[4]In Lakh INR.

iminosugar phosphonates, iminosugar C-Glycosides and investigation of biological activities					
Quantum computing with trapped neutral atoms and cold ions: Towards fault tolerant computation	Dr. Bindiya Arora[5]	DST	2010-13	19.32	7.80
The Z-classes in classical groups	**Dr. K. Gongopadhyay**	DST	2011-14	3.24	1.80
Exploring surface polymer interaction via external forcing of the polymer	**Dr. Rajeev Kapri**	DST	2011-14	5.04	3.70
Conformational plasticity and amyloid aggregation of human serum albumin	**Dr. Samrat Mukhopadhyay**	CSIR	2011-14	22.42	11.14
Creation of virtual classrooms	**Prof. Arvind**	CIT	2011-14	39.45	39.45
Structure-Function studies on vibrio cholerae cytolysin, a membrane damaging poreforming toxin	**Dr. Kausik Chattopadhyay**	DBT	2011-14	62.64	53.04
Molecular Genetic Analysis of Mitochondrial Regulation of Cell Growth in Drosophila	**Dr. Sudip Mandal**	DBT	2011-14	67.24	51.94
Troposheric OH Reactivity and VOC Measurements within India	**Dr. Vinayak Sinha**	Max Planck DST	2011-14	22.03	22.03
Metal Organic Frameworks comprised of dimetal units and muti-atom	**Dr. Sanjay Mandal**	DST	2011-14	36.36	20.76

[5]Now at G N D University, Amritsar.

organic linkers					
A study of Valued fields and irreducible polynomials	**Prof. S. K. Khanduja**	NBHM	2011-14	4.94	4.94
Quantum heat engines: work, entropy and information at the nanoscale	**Dr. Ramandeep Singh Johal**	DST	2011-14	13.56	5.00
An empirical assessment of the role of inter sexual conflict in life history evolution	**Dr. N. G. Prasad**	DST	2011-14	33.01	18.50
Development of Novel N-Heterocyclic Carbenes and Their Application in Organo and Organometallic Catalysis	**Dr. R. Vijaya Anand**	DST	2011-14	18.05	11.35
Sys TB: A Network Program for Resolving the Intracellular Dynamics of Host Pathogen Interaction in TB Infection	**Prof. Sudeshna Sinha**[6]	DBT	2011-14	41.28[7]	11.61
Study of Vibrio cholerae porin ompU towards elucidating its role in host immunomodulation	**Dr. Arunika Mukhopadhyay**	DBT	2011-14	50.20	29.03
Investigation into the sulphur assimilatory pathways of candida albicans	**Prof. Anand K. Bachhawat**	DBT	2011-14	20.91	20.91

[6]This project has a large number of Investigators from various institutes. Prof. Sudeshna Sinha is the investigator from IISER Mohali but not the PI for this project.

[7]This is the amount to be spent at IISER Mohali and it is not the total amount sanctioned for this project.

Elucidating the role of 5-oxopolinases in saccharomyces cervisiae in the light of the truncate y-glutamy i cycle of yeasts	**Prof. Anand K. Bachhawat**	DST	2011-14	11.09	4.53
Liquid crystal Nanocrystal - A new resource of functional soft materials for nanosciences	**Dr. S. K. Pal**	DST	2011-14	26.55	20.75
Identification and characterization of cell type specific transcription factors from Arabidopsis stem cell niche to construct a gene regulatory network	**Dr. Ram Kishor Yadav**	DBT (IYBA)	2012-15	41.81	19.50
Deciphering the function of Claudins in the nervous system	**Dr. Kavita Babu**	DBT (IYBA)	2012-15	41.19	19.30
Cell type-Specific Role of Homer Proteins IN Synaptic Plasticity	**Dr. Samarjit Bhattacharya**	DBT	2012-14	54.19	29.39
Passive Sensor Materials based on Crystals	**Dr. S. K. Pal**	BRNS	2012-15	16.50	13.70
Logical approaches to the Enantioselective synthesis of Biologicaly active compounds	**Dr. S. V. Rama Sastry**	DST	2012-15	25.25	11.80
Fabrication of mesoscopic electromechanical systems for	**Dr. Ananth Venkatesan**	DST	2012-15	250.00	217.00

ultra low temperature studies					
A Study of polynomials over valued fields	**Prof. Sudesh Kaur Khanduja**	NBHM	2012-15	1.89	0.59
Regulation of RNA splicing	**Dr. Shravan K. Mishra**	Max-Planck DST	2013-16	40.50	13.50

14 Ongoing fellowships hosted at IISER Mohali

Fellowship	**Fellow**	**Duration**	**Amount** Sanctioned[8]	**Amount** Received[9]
Ramanujan Fellowship	**Dr. K. P. Singh**	2010-15	73.00	39.70
J. C. Bose Fellowship	**Prof. Kapil H. Paranjape**	2010-15	68.00	13.60
Ramanujan Fellowship	**Dr. K. P. Singh**	2010-15	73.00	39.70
Wellcome DBT	**Dr. Lolitika Mandal**	2010-15	349.00	255.00
Ramanujan Fellowship	**Dr. Ananth Venkatesan**	2011-16	73.00	31.10
Ramanujan Fellowship	**Dr. Yogesh Singh**	2011-16	73.00	14.60
Ramanujan Fellowship	**Dr. Sanjeev Kumar**	2011-16	73.00	14.60
J C Bose Fellowship	**Prof. Somdatta Sinha**	2011-16	68.00	13.60
DBT Research Associateship	**Dr. Banani Chattopadhyay**	2011-13	7.48	7.48
INSPIRE Faculty Fellowship	**Dr. Mahender Singh**	2012-17	59.00	19.00
J C Bose Fellowship	**Prof. Anand K. Bachhawat**	2011-16	68.00	13.60

[8]In Lakh INR.
[9]In Lakh INR.

Ramanujan Fellowship	**Dr. Goutam Sheet**	2012-17	73.00	14.60
Ramalingaswamy Re-entry Fellowship	**Dr. Ram Kishor Yadav**	2012-17	74.50	14.90
Wellcome-DBT Fellowship	**Dr. Kavita Babu**	2012-18	343.00	170.00
Wellcome-DBT Fellowship	**Dr. Mahak Sharma**	2012-18	327.00	152.00
Wellcome-DBT Fellowship	**Dr. Rajesh Ramachandran**	2013-19	324.00	6.30
NBHM Post-doctoral fellowship	**Dr. Khushwant Singh**	2013-15	2.00	2.00

15 Public Lecture

In 2012 we started a new series called public lecture. In this series we invite renowed scientists to speak on their work at a level that can be easily understood by interested members of the general public.

- April 18, 2012 (Wed 6:00 pm) **Prof. Lalji Singh**, BHU, *Genetic Diversity in Indian Populations and its health implications.*

16 Institute Colloquia

- April 4, 2012 (Wed 4:00 pm) **Prof. Jayant Udgaonkar**, NCBS Bangalore, *How do proteins fold and unfold?*
- April 11, 2012 (Wed 4:00pm) **Prof. Amit Roy**, IUAC, Delhi, *Quest for High Energies.*
- April 18, 2012 (Wed 4:00 pm) **Prof. Pushpito Ghosh**, CSMCRI, Bhavnagar, *Our initiatives in harnessing renewable energy sources for sustainable development.*
- April 20, 2012 (Fri 5:00 pm) **Dr. Jaikumar Radhakrishnan**, TIFR, Mumbai, *Endre Szemeredi's Random Structures and Algorithms.*
- April 25, 2012 (Wed 4:00 pm) **Prof. Biman Nath**, RRI, Bangalore, *Galactic outflows and cosmological implications.*
- August 23, 2012 (Thur 4:00 pm) **Dr. R. Ramachandran**, Frontline, Delhi, *Scientists, Scientocracy and Science Communication in India.*
- October 3, 2012 (Wed 4:00 pm) **Prof. D. M. Salunke**, Regional Centre for Biotechnology, Gurgaon, *Revisiting tenets of specificity and recognition in immune system.*
- October 5, 2012 (Fri 5:00pm) **Prof. Avinash Khare**, IISER Pune, *Basic Constituents of Matter.*
- October 31, 2012 (Wed 4:00 pm) **Prof. Vidyanand Nanjundiah**, IISc, Bangalore, *Living Groups*
- November 14, 2012 (Wed 4:00pm) **Prof. E. Dufourc**, Institute of Chemistry & Biology of Membranes & Nanoobjects, Universite Bordeaux, France, *The French High Field NMR network and it use in Biophysics of Membrane Assemblies: lipids, peptides and colloids for health & nutrition.*

- November 16, 2012 (Fri 5:00 pm) **Dr. Valerie Gros**, Gif sur Yvette, France, *Experimental characterization of volatile organic compounds in various atmospheres: From polar to urban environment*
- January 9, 2013 (Wed 4:00pm) **Prof. Helene Lefebvre-Brion**, Universite Paris Sud, Orsay, France, *Adiabatic vs Diabatic models and coupled channel treatments for diatomic molecules*
- February 7, 2013 (Thur 5:00 pm) **Prof. Yehiam Prior**, Weizmann Institute of Science, *Molecular Manipulation by Ultrafast Laser Pulses*
- February 26, 2013 (Wed 4:00 pm) **Prof. Jitendra P Khurana**, University of Delhi, South Campus, *Plant Genome Research: Implications for Crop Improvement*

17 Technical Seminars

- 2 April, 2012 (Mon 5:00 pm) Dr. Yogish I. Holla, TIFR Mumbai *Topological quantum field theory and Cobordism hypothesis.*
- 9 April, 2012 (Mon 5:00 pm) Dr. Varsha Singh, Duke University Medical Centre, North Carolina *Innate immune responses to bacterial pathogens: Control by stress response pathways and the nervous system.*
- 9 April, 2012 (Mon 6:00 pm) Dr. Sambuddho Mukherjee, Duke University Medical Centre, North Carolina *T Cell Immunobiology in the Lung: Implications for Pulmonary Fibrosis.*
- 10 April, 2012 (Tues 4:00 pm) Prof. S. Ramasesha, SSCU, IISc Bangalore *Chemistry of Correlated Electrons.*
- 12 April, 2012 (Thur 5:00 pm) Dr. Jayeeta Bhawmik, Massachusetts General Hospital and Harvard Medical School, Boston, MA, USA *Development of Smart Nanotheranostics for Efficient Detection and Treatment of Cancer and Microbial Infection.*
- 13 April, 2012 (Fri 5:00 pm) Dr. Gurdeep Rastogi Department of Plant Pathology, University of California, Davis, CA 95616 *Beyond census: harnessing microbes for biotechnology.*
- 19 April, 2012 (Thur 12:00 noon) Dr. Ullas Kolthur Seetharam, TIFR Mumbai *Sirtuins in metabolic/energy homeostasis and insulin signaling: implications on organismal survival and, aging and age-related diseases.*
- 8 May, 2012 (Tues 3:00 noon) Dr. Amit Ghosh, Lawrence Berkeley National Laboratory *Metabolic and Protein Structure Networks for Systems Biology.*
- 17 May, 2012 (Thur 2:00 pm) Dr. V N Sivanandam, University of Notre Dame, Indiana, USA *NMR Applications to Biomolecular Structure and Dynamics.*
- 21 May, 2012 (Mon 4:00 pm) Dr. Supriyo Das, Linnaeus University, Sweden *Application of Environmental Geochemistry in Paleo-Reconstruction.*
- 30 May, 2012 (Wed 3:00 pm) Sanjeev Chandrayan, Deptt. of Biochemistry & Molecular Bio, University of Georgia, Athens, GA, USA *Pyrococcus furiosus : A model thermophilic anaerobe for biofuel.*
- 25 June, 2012 (Mon 4:00 pm) Dr. Santanu Karan, National Institute of Materials Science, Japan *Carbon Crafted Into Ultrathin Membranes: Viscous Transport of Organic Solvents through Molecular Size Pores.*

- 26 June, 2012 (Tues 4:00 pm) Prof. Hilda Cerdeira, IFT, UNESP, Sao Paolo, Brazil *Identifying financial crises in real time.*
- 29 June, 2012 (Fri 4:00 pm) Dr. Savita Chaudhary, Panjab University, Chandigarh *Surfactant assisted synthesis of Metallic nanoparticles and Solubilization of Organochalcogen compounds.*
- 5 July, 2012 (Wed 2:00 pm) Prof. J. Chengalur, NCRA-TIFR, Pune *An Introduction to Radio Astronomy.*
- 9 July, 2012 (Mon 4:00 pm) Dr. Debashree Ghosh, University of Southern California, USA *Understanding electron transfer processes in complex environments - Hybrid QM/EFP approach.*
- 16 July, 2012 (Mon 4:00 pm) Dr. Khalid Yousuf, Indian Institute of Integrative Medicine, Jammu, J&K *Carbohydrate to biologically significant compounds.*
- July 31st, 2012 (Tue 4:00 pm) Prof. Bryan Sanctuary, McGill University, Canada *Spin, entanglement, non-locality and foundations of QM.*
- August 3rd, 2012 (Fri 4:00 pm) Dr. Venkatakrishnan Parthasarathy, University of Alberta, Canada *Forging Bonds and Funneling Interactions for Functional Organics.*
- August 6th, 2012 (Mon 4:00 pm) Dr. Amit Verma, The Energy and Resources Institute (TERI), New Delhi *Study of safe disposal of high level radioactive wastes in deep underground repositories.*
- August 7th, 2012 (Tue 3:00 pm) Dr. Siva Kesava Raju, National Institute of Standards and Technology, USA *Grafted Polymers, Modified HPLC Supports and Speciation analysis methods for various Analytical Applications.*
- August 7th, 2012 (Tue 4:00 pm) Dr. Soumen Mandal, Institute Neel, Grenoble, France *Superconductivity: Its application in nanomechanical systems and spintronics.*
- August 8th, 2012 (Wed 4:00 pm) Dr. Pulak K Ghosh, Digital Material Lab, RIKEN, Japan *Quantum effects in energy and charge transfer in a wheel-shaped artificial photosynthetic complex.*
- August 13th, 2012 (Mon 4:00 pm) Dr. Bhupendra Nath Tiwari, INFN Rome *Thermodynamic Geometry, Statistical Fluctuations and Black Holes in String Theory.*
- August 14th, 2012 (Tue 4:00 pm) Dr. S. Saleesh Kumar *Self Assembled Materials for Electro-Optic Applications.*

- August 17th, 2012 (Fri 4:00 pm) Dr. Sugumar Venkataramani *Triradicals, Magnetic switching and Betalactam Antibiotics.*

- August 29th, 2012 (Wed 4:00 pm) Dr. Mu. RamKumar, Department of Geology, Periyar University, Salem - 636011 *Integrated Chemo-Sequence stratigraphy: A Sure-Fire technique for Petroleum exploration and Stratigraphic Correlation.*

- August 30th, 2012 (Thur 4:00 pm) Dr. Vinod Chandra, INFN Florence *Hot and Dense Nuclear Matter in Relativistic Heavy-ion Collisions.*

- September 10th, 2012 (Mon 4:00 pm) Dr. Shamsher Ali, Former President, Bangladesh Academy of Sciences *New ways of teaching science and mathematics: Doing more with less.*

- September 11th, 2012 (Tues 4:00 pm) Dr. Sanjay Pratihar, IIT Kharagpur *Metal Catalysis: From Electrophilic to Nucleophilic.*

- September 13th, 2012 (Thur 5:00 pm) Dr. Atul Bhardwaj, University of Alberta, Canada *Polysubstituted Tetrahydropyrans and NO Releasing Prodrugs as Safe Anti-inflammatory and Anti-cancer Agents: Synthesis, Biological Evaluation and Computational Studies.*

- September 13th, 2012 (Thur 4:00 pm) Dr. Vinay Kumar Tyagi, National Taiwan University *Water Health Microbiology.*

- September 18th, 2012 (Tues 4:00 pm) Dr. Gurpreet Kaur, Punjab University, Chandigarh *Colloidal drug delivery systems.*

- October 1st , 2012 (Mon 4:00 pm) Dr. Shamik Chakraborty *Laser Spectroscopy in gas phase: Probing intrinsic properties of bio-molecules.*

- October 1st , 2012 (Mon 3:00 pm) Dr. Hilal Farooq, Indian Institute of Technology Bhubaneswar School of Earth, Ocean and Climate Sciences *Arsenic contamination of the groundwater in Bengal delta.*

- October 3rd, 2012 (Wed 4:00 pm) Dr. Subinoy Das, Aachen, Germany *Mysteries of dark matter, dark energy and their possible connection to Neutrinos.*

- October 4th, 2012 (Thur 5:00 pm) Prof. Pushpa Khare, CSIR Emeritus Scientist, IUCAA, Pune *Metal and Dust component of the universe as determined through QSO absorption lines.*

- October 5th, 2012 (Fri 4:00 pm) Dr. Ananya Debnath, Max Planck Institute for Polymer Research, Germany *Multiscale modeling of processes involving biological macro and long chain molecules.*

- October 5th, 2012 (Fri 2:00 pm) Ms. Mamta Gulati, RRI Bangalore *Unstable modes of counter–rotating nearly Keplerian discs.*
- October 8th, 2012 (Mon 4:00 pm) Dr. Joyee Ghosh, Uni. Saarland, Germany *Single Atom-Photon Interaction for Quantum Information Applications.*
- October 23rd, 2012 (Tues 11:00 am) Prof. Satpal Singh, State University of New York (SUNY) at Buffalo USA *From Molecules to Mind to Society: Frontiers of Ignorance.*
- November 1st, 2012 (Thur 4:00 pm) Dr. Ramesh Ahuja, University of Goettingen, Germany *Time-Resolved Imaging, Spectroscopy and Microscopy using ultrafast gated Intensified CCD cameras.*
- November 1st, 2012 (Thur 4:00 pm) Dr. Jayanta Chatterjee *Peptides: from chemical genetics to orally available drugs.*
- November 5th, 2012 (Mon 5:00 pm) Dr. Smriti Mahajan *Evolution of galaxies in cosmic suburbia.*
- November 8th, 2012 (Thur 2:00 pm) Dr. Rajesh V. Nair, BARC Mumbai *Molding the light propagation and emission using photonic band gap structures.*
- November 19th, 2012 (Mon 4:00 pm) Dr. Amar Nath Gupta, Uni. Alberta, Canada *Observing protein folding and misfolding in the single-molecule regime with optical tweezers.*
- November 20th, 2012 (Tue 4:00 pm) Dr. Sunil Mishra, Halle, Germany *Magnetization fluctuations and magnetization dynamics in NiO nanoparticles.*
- November 22nd, 2012 (Thur 4:00 pm) Dr. Ashutosh Sharma, Lucknow University *Laser-Plasma Interaction: Theoretical and Numerical Modeling.*
- November 27th, 2012 (Tues 5:00 pm) Nishikanta Khandai, Brookhaven *Galaxy Formation in the High redshift Universe.*
- November 28th, 2012 (Wed 11:00 am) Prof M. S. Sriram, University of Madras *Contributions to Mathematics in Ancient India.*
- November 29th, 2012 (Thur 4:00 pm) Dr. Prabuddha Chakraborty, ISI Chennai Center *Presence of quantum diffusion in two dimensions: effect of inter-particle interactions on Anderson localization.*
- December 5th, 2012 (Wed 5:30 pm) Dr. Deepak T. Nair, NCBS, TIFR, Bangalore *Replication of the flaviviral genome: Structure of a pre-initiation state and mechanism of initiation.*

- December 10th, 2012 (Mon 4:00 pm) Dr. Amilan Jose *Chemistry meets biology via molecular recognition: Supramolecular receptors for bioanalytes and catalysis.*
- December 13th, 2012 (Thur 4:00 pm) Dr. Kanak Saha, MPE Germany *Secular evolution in disk galaxies: impact of dark matter halos.*
- December 17th, 2012 (Mon 4:00 pm) Dr. Vinita Gowda, National Museum of Natural History, Washington, DC *Building evolutionary trees of tropical herbs: Ecology, phylogenetics, and evolution within Zingiberales.*
- December 19th, 2012 (Tues 4:00 pm) Prof. Fabien Bretenaker, Laboratoire Aim Cotton, Paris, France *Electromagnetically induced transparency: a quantum interference effect to control the velocity of light.*
- December 28th, 2012 (Fri 2:00 pm) Dr. Amol Holkundkar, BITS Pilani *Laser interaction with atomic clusters and preformed plasma.*
- January 2nd, 2013 (Wed 4:00 pm) Dr. Jeanne Scott, IMSc, Chennai *Multivariate Poincare Polynomials.*
- January 7th, 2013 (Mon 12:00 noon) Dr. A. Chandrakant Sharma, Ruprecht-Karls-Universität Heidelberg *Rational points on Elliptic curves and congruences between Modular forms.*
- January 7th, 2013 (Mon 4:00 pm) Dr. Saumyadip Samui, Durban *High redshift Universe : A semi-analytical approach.*
- January 9th, 2013 (Wed 4:00 pm) Prof. Helene Lefebvre Brion, Universite Paris Sud, Orsay *Adiabatic vs Diabatic models and coupled channel treatments for diatomic molecules.*
- January 9th, 2013 (Wed 5:15 pm) Prof. Roland Lefebvre, Universite Paris Sud, Orsay *Exceptional Resonances for a control of molecular processes.*
- January 10th, 2013 (Thur 4:00 pm) Dr. Chandreyee Sengupta, IIA-Spain *Sociology of galaxies: some aspects of galaxy evolution in low density environments.*
- January 11th, 2013 (Fri 4:00 pm) Dr. William Bloss, University of Birmingham *Trees, Alkenes & Ozone: Chamber & Field Studies of Atmospheric Chemistry.*
- January 11th, 2013 (Fri 4:00 pm) Dr. Dipanjan Chakraborty, MPI Stuttgart, Germany *Brownian Motion of a Heated Colloid.*
- January 11th, 2013 (Fri 4:00 pm) Dr. Rasmita Kar *Existence of Solutions for a Class of Non-Linear Elliptic Equations.*

- January 16th, 2013 (Wed 5:00 pm) Dr. Sudarshan Iyengar, IIT Ropar *Understanding Navigational Algorithms with Network Analysis.*
- January 17th, 2013 (Thur 4:00 pm) Dr. Sudipta Sarkar, IMSc Chennai *Black Hole Thermodynamics: Beyond General Relativity.*
- January 18th, 2013 (Fri 4:00 pm) Dr. Priyanka Shukla, IISER Kolkata *Dynamics of Granular Matter: shear banding and order parameter theory.*
- January 21st, 2013 (Mon 5:00 pm) Dr. Gina Bloodworth, Salisbury University *Dams and dam removal in America: pragmatism or ideology?*
- January 21st, 2013 (Mon 4:00 pm) Dr. Anuj Sharma, Panjab University Chandigarh *Improvement in recognition of handwritten text using structural features.*
- January 23rd, 2013 (Wed 2:00 pm) Dr. Santanu Karan, Imperial College, London *Making Thinner for Faster: Diamond-Like Carbon Nanosheets Crafted Into Super Permeable Membranes.*
- January 28th, 2013 (Mon 4:00 pm) Dr. Priyotosh Bandyopadhyay, Helsinki Inst. of Phys. *Perspective of Higgs searches at the LHC.*
- January 28th, 2013 (Mon 5:00 pm) Dr. Kausik Giri *High-dimensional Quantum Dynamics Using MCTDH.*
- January 31st, 2013 (Thur 3:00 pm) Dr. Dhruv K. Sethi, Harvard Medical School, Boston, USA *T cell antigens: Selection, presentation and recognition.*
- February 1st, 2013 (Fri 4:00 pm) Dr. Sartaj Ul Hasan, Carleton University, Canada *Vector Sequences Over Finite Fields.*
- February 1st, 2013 (Fri 4:00 pm) Prof. Makoto Yasuda, Department of Applied Chemistry, Osaka University, Japan *Lewis Acid Chemistry of Designed Borate Esters Using Cage-Shaped Organic Framework.*
- February 4th, 2013 (Mon 4:00 pm) Dr. Dharmarajan Guha, IISER Kolkata *Spatial variation in disease resistance and tolerance in a natural vector-parasite system: Do disease "hot-spots" breed more deadly mosquitoes?*
- February 7th, 2013 (Thur 4:00 pm) Dr. Umakanta Tripathy, McGill Uni., Canada *Detecting malaria and imaging extra cellular matrix in tissues by multi-modal nonlinear laser scanning microscopy (NLSM).*
- February 8th, 2013 (Fri 4:00 pm) Dr. Shyamashree Upadhyay, IIT Guwahati *An algorithm for computing the HK function of disjoint-term trinomial hyper surfaces.*

- February 13th, 2013 (Wed 3:00 pm) Dr. Saravanan Matheshwaran, EMBL, Heidelberg, Germany *Chromatin Recognition and Remodeling: Interactions between Histone Core and Actin Related Protein 8 (Arp8).*

- February 13th, 2013 (Wed 2:00 pm) Prof. Carlos Trallero, J. R. M. Laboratory, Kansas State University *Learning about molecules with extreme non-linear optics.*

- February 15th, 2013 (Fri 3:00 pm) Dr. Ravindresh Chhabra *Role of miR-23a 27a 24-2 cluster in the induction of apoptosis.*

- February 15th, 2013 (Fri 4:00 pm) Dr. Suchandan Kayal *Estimating the Renyi Entropy of Several Exponential Populations.*

- February 18th, 2013 (Mon 3:00 pm) Dr. Ramanujam Srinivasan, National University of Singapore *Assembly and Dynamics of Bacterial Cytoskeleton: Fission Yeast - A Cellular Model.*

- February 18th, 2013 (Mon 4:00 pm) Dr. Vivek Rai, New York University School of Medicine *The RAGE Axis: Novel Molecular and Structural Insights and Key Regulations in Diseases: Inflammation to Cancer.*

- February 19th, 2013 (Tues 3:00 pm) Dr. Ritesh Gautam, NASA/Goddard Space Flight Center *Atmospheric Aerosols and the South Asian Climate System.*

- February 20th, 2013 (Wed 4:00 pm) Prof. Maxwell J. Crossley School of Chemistry, The University of Sydney, NSW 2006, Australia *Functionalisation of the porphyrin periphery for photosynthesis and energy up-conversion studies.*

- February 22nd, 2013 (Fri 4:00 pm) Prof. A.J.C. Varandas Departamento de Qu mica, Universidade de Coimbra, 3005 535 Coimbra, Portugal *Odd-hydrogen: energetics and role on bimolecular and water-cluster mediated atmospheric reactions.*

- February 25th, 2013 (Fri 4:00 pm) Prof. Jörn Manz, Institut für Chemie und Biochemie, Freie Universität Berlin, Germany *PANTA RHEI - Electron fluxes during chemicl reactions.*

- February 25th, 2013 (Mon 4:00 pm) Dr. Bindusar Sahoo, Nikhef, Amsterdam *Topologically massive higher-spin gravity.*

- March 1st, 2013 (Fri 5:00 pm) Dr. Jennifer Fluri, Associate Prof. Dartmouth College *States of (in)security: corporeal geographies and bio-technologies.*

- March 1st, 2013 (Fri 3:00 pm) Dr. Paras Anand, St. Jude Children's Research Hospital, Memphis, TN, USA *Nod-Like Receptors in Pathogen Recognition and Host Defense.*

- March 4th, 2013 (Mon 4:00 pm) Dr. Satyabrata S I *Gold Nanoparticles: A Promising Material for Nanotechnology.*

- March 4th, 2013 (Mon 4:00 pm) Dr. Amit Apte, TIFR (CAM), Bangalore *When nonlinearity meets uncertainty: a Bayesian perspective on data assimilation.*

- March 4th, 2013 (Mon 3:00 pm) Dr. Debamalya Banerjee, Max Planck, Muelheim *Investigating spin dynamics with microwave: Applications in condensed matter physics to biology.*

- March 4th, 2013 (Mon 12:00 noon) Prof. M. Krishnamurthy, TIFR *Accelerating neutral atoms on a table-top.*

- March 5th, 2013 (Tues 3:00 pm) Dr. Malik Keshwani, Univ. of California, San Diego, USA *cAMP dependent protein kinase A (PKA): New insights from an old kinase.*

- March 7th, 2013 (Thur 4:00 pm) Dr. Preetam Singh *Materials for Alternative Energy.*

- March 7th, 2013 (Thur 4:00 pm) Dr. Krishan Kumar Sony, University of Rajasthan *Neuropsychological assessment for cognitive decline in acclimatized low landers staying at high altitude.*

- March 11th, 2013 (Mon 4:00 pm) Dr. Syed Masood Husain, National Centre for Biological Sciences, TIFR, Bangalore *Unraveling the Biosynthesis of Natural Products using Chemical Tools.*

- March 11th, 2013 (Mon 4:00 pm) Professor M.S. Raghunathan *TITLE?*

- March 14th, 2013 (Thur 3:00 pm) Dr. Rahul Hiremath, IISc. Bangalore *Low Carbon Path for Sustainable Development.*

- March 15th, 2013 (Fri 4:00 pm) Dr. Anup Prasad, School of Earth and Environmental Sciences, Schmid College of Science and Technology, Chapman University, Orange, CA, USA *TITLE?*

- March 16th, 2013 (Tues 6:00 pm) Sh. Hari Pulakkat, Bangalore based Science Journalist and Science Writer *Science journalism: is there a future in it as a profession?*

- March 18th, 2013 (Mon 4:00 pm) Dr. Sibansu Mukhopadhyay, University of Calcutta *Decoding the Power of Language: From the Crossroads of Linguistics, Politics and Philosophy.*

- March 20th, 2013 (Wed 4:00 pm), Dr. Vijaya Ramadas Mandala, Machester University *The Raj in Colonial India and the Paradoxes of Wildlife Conservation: British Attitudes and Expediencies.*

- March 25th, 2013 (Mon 4:00 pm) Dr. Amol M Kendhale, Department of Chemical Engineering, Eindhoven University of Technology, Netherlands *Novel Artificial Architect: From design to Applications.*

- March 26th, 2013 (Tue 4:00 pm) Dr. Nivedita Mitra, Yale University, USA *Membrane proteins in human evolution and disease: studying them in cells and reconstituted lipid bilayers.*

- March 26th, 2013 (Tue 3:00 pm) Dr. Sharvan Sehrawat, Whitehead Institute for Biomedical Research, Cambridge, USA *Function and differentiation of virus-specific CD8 T cells.*

- March 28th, 2013 (Thur 4:00 pm) Dr. J. Sreedhar Reddy, University of Muenster, Germany *Role of Molecular Design and Packing in Organic Semiconductor Materials for High Performance Field Effect Transistors (FETs).*

18 Faculty Seminars

- Sep. 12, 2012 (Wed 4:00pm)
  - **Prof. K. S. Viswanathan**, *Spectroscopy-A basic science for industrial applications.*
  - **Dr. B. Sinha**, *The role of natural aerosol particles in initiating and sustaining rainfall over remote continental regions.*
- Feb. 13, 2013 (Wed 4:00pm)
  - **Dr. Anu Sabhlok**, *Travelling Tales: Ethnographic stories from the Indo-Tibetan Border.*
  - **Prof. J. S. Bagla**, *Observing the Epoch of Reionization with the redshifted signal in Hyperfine transition of Helium-3 ion.*

19 Account Statement

The Annual Statement of Accounts of the Institute for the Financial Year 2012-13 has been finalized and prepared in the prescribed format (Form of Financial Statement Non-Profit Organization) provided by MHRD. This includes the Balance Sheet, Income & Expenditure Account and Receipt & Payment Account. The Accounts have been prepared on accrual basis. The Statement of Accounts of the Institute is audited by a Chartered Accountant firm of Chandigarh (Prem Garg & Associates), who had been appointed as internal auditor of the Institute. Final Accounts are audited by C.A.G. of India / PAG (Punjab & UT).

19.1 Plan Grant

The Institute received a sum of Rs. 13000.00 Lakh as Grant-in-Aid from MHRD in the Year 2012-13. As per utilization certificate on account of 2011-12, there is an opening balance of Rs. 705 Lakh. Out of the total amount of Rs. 13705 Lakh available under plan grant, the following expenditure has been made under different budget heads in 2012-13.

[h]	**Budget Head**		**(Rs. in Lakh)**
(i)	Salary Component	:	1060
(ii)	Non- Salary Component	:	1473
(iii)	Purchase of Equipment	:	3445
(iv)	Purchase of Furniture	:	324
(v)	Construction of Building (Including Deposit money)	:	6719
(vii)	Library Books	:	25
(viii)	Computers Accessories &Peripherals	:	190
	Total		13236

19.2 Research & Development Grant

In addition to the Plan Grant, the Institute also received a sum of Rs. 1069 Lakh (in 2012-13) under Research & Development Account (with an opening balance of Rs. 482 Lakh carried over from the year 2011-12). In case of Research and Development (R &

D A/c) account, the details are as follows:

Income:

		(Rs. in Lakh)
(i)	Opening Balance as on 01.04.2012	482
(ii)	Grant received in 2012-13	1069
	Total	1551

Expenditure:

(i)	Pay and Allowances	35
(ii)	TA	3
(iii)	Scholarship	248
(iv)	Purchase of Equipment	61
(v)	Contingency	24
(vi)	Consumables	78
(vii)	Overheads	8
(ix)	Other Expenditure	16
	Total	473

Thus, the total amount available was Rs. 1551 Lakh, out of which Rs. 473 Lakh was spent under R & D A/c with a closing balance of Rs. 1078 Lakh.

19.3 Endowment Fund

The Board of Governors had approved to open an Endowment Fund Account in its 5^{th} meeting held on 30.04.2009. Balance available under this account is Rs. 592 Lakh as on March 31, 2013.

19.4 Student Welfare Account

In addition to the above, there is a Student Welfare Account with a closing balance of Rs. 59 Lakh at the end of financial year 2012-13.