

ANNUAL REPORT 2008-2009



**Indian Institute of Science Education and Research
(IISER) Mohali**

March 31, 2009

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1 Preface

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. Currently, five IISERs have been created and are functioning at Pune, Kolkata, Mohali, Bhopal and Thiruvananthapuram. The IISERs have been patterned after the Indian Institute of Science (IISc) Bangalore in terms of high quality research in the basic sciences, but the IISERs in addition have a focus on high quality education in the basic sciences at the undergraduate as well as the postgraduate level. Each IISER is an autonomous institution and will award its own degrees. The financial outlay for each IISER is around Rs. 500 crores over a period of five years, with the aim to create state-of-the art research and teaching laboratories, library and computational facilities. The projected strength of each IISER in the next five years is around 2000 students (undergraduate as well as doctoral research fellows) and 200 faculty members in all core disciplines.

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. The major focus at IISER Mohali is to create a world class scientific institution with an intellectually alive research atmosphere.

IISER Mohali's transit campus is currently located at MGSIPAP Complex, Sector 26 Chandigarh, in space allocated by the Government of Punjab. IISER Mohali's new fully residential campus is being developed on 125 acres of land in the Knowledge City at Sector 81 Mohali. The new campus is around 15 km from the center of Chandigarh city, and will be easily accessible from Mohali's envisaged international airport. Architectural plans for the new integrated campus include an academic block, an administrative block, halls of residences for students, central computing and library buildings, central analytical facility, faculty and staff residential complex, sports & recreation facilities, institute guesthouse, and additional support infrastructure such as a medical center, campus creche & childcare facilities, and a bank.

The 5 year MS (Int) program in Science at IISER Mohali admits students after 10+2. The course structure is interdisciplinary and research oriented in nature, with a focus on the basic sciences. The curriculum provides comprehensive core courses in the first two years of the program in all areas of basic sciences: chemical, physical, mathematical and biological sciences. After the first two core years, students can branch out to contemporary areas of interdisciplinary research of their choice. In addition to the basic courses, IISERs

will also have courses in the interdisciplinary areas of earth, planetary and environmental sciences, computational sciences, and humanities & social sciences. With a firm foundation in basic sciences and mathematics in the first two years, the students will be able to choose the subject in which they will major including interdisciplinary areas. An early exposure to research through summer training in other laboratories and institutions of the country, including industrial organizations, and counseling schemes for major R&D career opportunities are other attractive features of the program. In the 2007-08 academic year, 25 students were admitted to the Integrated Masters program at IISER Mohali in the session that began on 16th August 2007. In the 2008-09 academic year, 40 students were admitted to the Masters program in the session that began in August 2008. While KVPY scholars were admitted “automatically” to the MS program, the JEE merit list and extended merit list students were admitted on the basis of their ranks. The 5-Yr MS(Int) 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.

Through liaison with research laboratories under the Department of Atomic Energy, Space, Science and Technology and Biotechnology, as well as Council of Scientific & Industrial Research, opportunities will be created for job placement for students on the basis of campus interviews. The fifth year of the integrated Masters program will be devoted to full time research or to a technical project or to specialized training, in which the students will have to write a dissertation. The research component would result in lowering of the average period for obtaining a PhD degree, for those students who pursue a doctoral program at IISER. Provision for an accelerated development for truly deserving individuals will be a special feature of the program. The IISERs will maintain a high standard of education, training and scholarship, comparable to that in the best Indian institutes and international universities in various areas of learning. In addition to the integrated Masters program, the IISER will also have a post BSc. integrated PhD program, as well as a doctoral program (post MSc). All teaching activities are based on a semester system accompanied by vigorous teacher-student contact time through research, journal clubs, seminars and colloquia. Rigorous laboratory courses are an essential part of the program.

The doctoral 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, scholars will be involved in several professional activities such as seminars, workshops and review meetings. The institute has a provision for a number of post-doctoral fellowships as well. A total of 07 PhD scholars in the core research disciplines of physics, biology and mathematics

were admitted to the PhD program at IISER Mohali in the academic session beginning August 2008. A total of 11 PhD scholars in physics, chemistry, biology and mathematics were admitted to the PhD program in the winter session beginning January 2009.

Research infrastructure currently available at IISER Mohali includes a computing facility, a sophisticated instrumentation facility and a modern library with access to many research journals and on-line databases. IISER Mohali aims to have a strong core faculty selected on a highly competitive basis and supported by attractive startup research grants. Young bright scientists including those wanting to return to India from abroad for teaching and research careers will be specially considered for faculty positions. Current faculty research at IISER Mohali spans a diverse spectrum ranging from theoretical chemistry, quantum information processing, metamaterials and NMR spectroscopy to inorganic, organic and physical chemistry, algebra, immunology, chemical biology, single-molecule fluorescence spectroscopy, prion proteins and biophysics. IISER Mohali aims to be a “knowledge basin of attractor” in the northern region in India within the next decade. In this context, the institute plans on developing a synergetic network with other academic institutions both in India and abroad, and will hold regular conferences, seminars and symposia in research areas as well as workshops aimed at addressing fundamental issues in science education in India.

2 Board of Governors

- ♦ Professor P. Rama Rao (Chairman)
Former Secretary, Department of Science and Technology,
International Advanced Research Centre for Powder Metallurgy
and New Materials (ARCI),
Balapur P.O. Hyderabad 500005.
- ♦ Shri R P Agrawal IAS (Member)
Secretary (HE), MHRD,
Shastri Bhavan, New Delhi 110001.
- ♦ Shri Ramesh Inder Singh IAS (Member)
Chief Secretary, Government of Punjab,
Chandigarh 160 001.
- ♦ Dr. Anil Kakodkar (Member)
Secretary, Department of Atomic Energy,
Anushakti Bhavan, CSM Marg, Mumbai 400001.
- ♦ Dr. T. Ramasami (Member)
Secretary, Department of Science and Technology,
Technology Bhavan, New Mehrauli Road, New Delhi 110016.
- ♦ Dr. M. K. Bhan (Member)
Secretary, Department of Biotechnology,
CGO Complex, Lodi Road, New Delhi 110003.
- ♦ Professor P. Balaram (Member)
Director, Indian Institute of Science,
Bangalore 560012
- ♦ Professor Surendra Prasad (Member)
Director, IIT Delhi
Hauz Khas, New Delhi 110016.
- ♦ Professor K. N. Ganesh (Member)
Director, IISER Pune,
900 NCL Innovation Park,
Homi Bhabha Road, Pune 411008.
- ♦ Professor S. V. Kessar (Member)
Department of Chemistry,
Punjab University, Chandigarh 160014.

- ♦ Professor A. K. Sood (Member)
Professor of Physics,
Indian Institute of Science, Bangalore 560012.
- ♦ Professor Ashutosh Sharma (Member)
Department of Chemical Engineering,
IIT Kanpur Kanpur 208016
- ♦ Professor S. G. Dani (Member)
School of Mathematics,
TIFR, Homi Bhabha Road, Mumbai 400 005.
- ♦ Shri S. K. Ray (Member)
Joint secretary & Financial Adviser, MHRD,
Shastri Bhavan, New Delhi 110001.
- ♦ Professor Ramesh Kapoor (Member)
IISER Mohali,
MGSIPAP complex, Sector 26, Chandigarh 160019.
- ♦ Professor C.G. Mahajan (Member)
IISER Mohali, MGSIPAP complex,
Sector 26, Chandigarh 160019.
- ♦ Professor N. Sathyamurthy (Ex-officio)
Director IISER Mohali,
MGSIPAP complex, Sector 26, Chandigarh 160019.
- ♦ Shri J. P. Singh (Secretary)
Registrar, IISER Mohali,
MGSIPAP complex,
Sector 26, Chandigarh 160019.

3 Academic Senate

- ♦ Professor N. Sathyamurthy (Chairman)
Director, IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh
- ♦ Professor R. C. Sobti (Member)
Vice-Chancellor, Panjab University
Chandigarh
- ♦ Professor S. C. Laroia (Member)
Director, NITTTR
Chandigarh
- ♦ Professor Vijay Gupta (Member)
Vice-Chancellor, Lovely University
Jalandhar
- ♦ Professor P. Rama Rao (Member)
Director, NIPER
Sector 67 SAS Nagar
- ♦ Professor Ashok Sahni (Member)
Centre for Advanced Study in Geology
Panjab University, Chandigarh
- ♦ Professor S. V. Kessar (Member)
Department of Chemistry
Panjab University Chandigarh
- ♦ Dr. A. K. Bachhawat (Member)
IMTECH Chandigarh
- ♦ Professor Ramesh Kapoor (Member)
Dean (Academic), IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh
- ♦ Professor C. G. Mahajan (Member)
Dean (Students), IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh
- ♦ Professor I. B. S. Passi (Member)
Honorary Professor, IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh

- ♦ Dr. Arvind (Member)
Associate Professor (DORD), IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh
- ♦ Sh. R. Mishra (Member)
Librarian, IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh
- ♦ Dr. Sanjay Mandal (Member)
Associate Professor, IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh
- ♦ Dr. Kavita Dorai (Member)
Assistant Professor, IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh
- ♦ Dr. Tapan Mukherjee (Member)
Assistant Professor, IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh
- ♦ Dr. Dinesh Khurana (Member)
Assistant Professor, IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh
- ♦ Sh. J. P. Singh (Secretary)
Registrar, IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh

Special Invitees

- ♦ Dr. Jagdeep Singh (Special Invitee)
Co-ordinator, IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh
- ♦ Dr. Sanjay Singh (Special Invitee)
Assistant Professor, IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh
- ♦ Dr. Amit Kulshrestha (Special Invitee)
Assistant Professor, IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh

- ♦ Dr. Ramandeep Singh Johal (Special Invitee)
Assistant Professor, IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh
- ♦ Dr. Chanchal Kumar (Special Invitee)
Assistant Professor, IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh
- ♦ Dr. Ramesh Ramachandran (Special Invitee)
Assistant Professor, IISER Mohali
MGSIPAP Complex Sector 26 Chandigarh

4 Administration

Director	Prof. N. Sathyamurthy
Dean (Academic)	Prof. R. Kapoor
Dean (Students)	Prof. C.G Mahajan
Dean (R&D)	Dr. Arvind
Registrar	Shri J.P. Singh
Coordinator	Dr. Jagdeep Singh (Punjab Government)
Librarian	Shri R. Mishra
Stores & Purchase Office	Shri Kulwant Singh
Chief Vigilance Officer	Dr. Dinesh Khurana

5 Research Advisory Committee (RAC)

- ♦ Dr. Girish Sahni (Chairman)
Institute of Microbial Technology,
Sector 39-A, Chandigarh 160036
- ♦ Professor C.S. Dey (Member)
Natl. Inst. Pharma. Edn. & Res. (NIPER)
Sector 67, Phase X, S.A.S. Nagar 160062
- ♦ Professor S. G. Dani (Member)
School of Mathematics, TIFR,
Homi Bhabha Road, Mumbai 400 005.
- ♦ Professor Ashutosh Sharma (Member),
Department of Chemical Engineering,
IIT Kanpur Kanpur 208016
- ♦ Professor R N Mukherjee (Member)
Department of Chemistry,
IIT Kanpur Kanpur 208016
- ♦ Dr. Arvind (Convener)
Dean R&D, IISER Mohali
MGSIPAP Complex, Sector 26 Chandigarh

6 Academic Staff

6.1 Faculty

1. Prof. N. Sathyamurthy (Prof Chemistry)
Research area: Theoretical chemistry, Reaction dynamics
2. Prof. R. Kapoor (Prof Chemistry)
Research area: Inorganic chemistry
3. Prof. C.G. Mahajan (Prof Physics)
Research area: Optics
4. Dr. Arvind (Assoc Prof Physics)
Research area: Quantum information theory, Quantum optics
5. Dr. Kavita Dorai (Asst Prof Physics)
Research area: NMR methodology, Quantum computing
6. S. A. Ramakrishna (Assoc Prof Physics) Aug 2008-Dec 2008
7. Dr. Sanjay Singh (Asst Prof Chemistry)
Research area: Inorganic synthetic chemistry, Gold chemistry
8. Dr. Tapan Mukherjee (Asst Prof Biology)
Research area: Molecular medicine
9. Dr. Dinesh Khurana (Asst Prof Mathematics)
Research area: Ring theory, Non-commutative algebra
10. Dr. Amit Kulshrestha (Asst Prof Mathematics)
Research area: Algebra
11. Dr. Sanjay Mandal (Assoc Prof Chemistry)
Research area: Organometallic chemistry
12. Dr. Chanchal Kumar (Asst Prof Mathematics)
Research area: Algebraic geometry
13. Dr. Ramandeep S Johal (Asst Prof Physics)
Research area: Statistical Mechanics
14. Dr. Samrat Ghosh (Asst Prof Chemistry)
Research area: Materials chemistry

15. Dr. R Ramesh (Asst Prof Chemistry)
Research area: Solid-state NMR spectroscopy
16. Dr. Lingaraj Sahu (Asst Prof Mathematics)
Research area: Functional Analysis
17. Dr. S Mukhopadhyay (Asst Prof Bio/Chem)
Research area: Protein folding, Misfolding, Prion & Amyloid biology
18. Dr. N G Prasad (Asst Prof Bio)
Research area: Evolutionary genetics
19. Dr. S Arulananda Babu (Asst Prof Chem)
Research area: Synthetic organic chemistry
20. Dr. A Mukhopadhaya (Asst Prof Bio)
Research area: Immunology
21. Dr. K Chattopadhyay (Asst Prof Bio)
Research area: Protein structure-function studies
22. Dr. Manash Kumar Paul (Lecturer Biology)
Research area: Cancer Biology
23. Dr. Bharti Bisht (Lecturer Biology)
Research area: Cancer Biology
24. Shri. Sushil Sivaram (Lecturer English)

6.2 Honorary Faculty

1. Prof. I.B. S. Passi (Hon Prof Mathematics)
Research area: Algebra
2. Prof. Ashok Sahni (Hon Prof Earth Sciences)
Research area: Earth Sciences
3. Prof. Anil Kumar (Hon Prof Physics)
Research area: NMR Spectroscopy

6.3 Adjunct Faculty

1. Dr. Girish Sahni (Biology) Director IMTECH Chandigarh
2. Prof. C.S.Aulakh (Physics) Professor PU Chandigarh
3. Dr. A.K.Bachhawat (Biology) Scientist IMTECH Chandigarh
4. Dr. Jagdeep Singh (Biology) Punjab Govt.
5. Dr. P. Guptasarma (Biology) Scientist IMTECH Chandigarh
6. Dr. Alok Mandal (Biology) Scientist IMTECH Chandigarh

6.4 Library

1. Shri Rajeshwar Mishra (Librarian)

7 Progress made in 2008-09

7.1 Milestones

- ♦ The CNR Rao foundation has constituted a cash prize of Rs. 5000/- for the best student in each semester at IISER Mohali. Mr. Amol Deshmukh received the prize for the 2007-2008 II Semester on August 15, 2008 from the Director. Mr Keshav Aggarwal, Mr Vikesh Sidhu, and Ms Anshu Gupta received the CNR Rao Foundation Prize for the best performance in the 2008-2009 I Semester on January 26, 2009.
- ♦ August 15 2008 was celebrated at IISER Mohali. The Chief Guest for the function was Prof. S. C. Laroia (Director NITTTR).
- ♦ A symposium to felicitate Prof. R. P. Bambah, a well known mathematician and the oldest living Fellow of Indian National Science Academy in Chandigarh, was jointly organized by INSA Local Chapter Chandigarh and IISER Mohali on August 16th 2008. On this occasion Professor I. B. S. Passi gave a talk on “Niels Henrik Abel (1802-1829) and Abel Prize 2008” and Professor R. J. Hans-Gill gave a talk on the mathematical contributions of Professor R. P. Bambah.
- ♦ IISER Mohali Foundation Day 2008 was celebrated on 27th September 2008. Prof. N. Sathyamurthy, Director IISER gave the welcome address, which was followed by the Foundation Day Lecture by Dr. Girish Sahni, Director IMTECH, Chandigarh.
- ♦ The Ground breaking ceremony for IISER boundary wall was held on December 29, 2008.
- ♦ Launch of INSPIRE and Presentation of INSPIRE Scholarship function was organized at Delhi on December 13, 2008 by Government of India, Ministry of Science and Technology. Mr. Sameep Chandel, Mr. Amol Deshmukh, Ms. Anshu Gupta, Mr. Vikesh Sidhu, and Mr. Keshav Aggarwal represented IISER Mohali and the cheque was received from the Honourable Prime Minister of India, Shri Manmohan Singh, by Mr. Sameep Chandel.
- ♦ Republic Day was celebrated on Jan 26th 2009 at IISER Mohali's transit campus. The citation for Academic Excellence for the 2008-2009 I Semester was given to Mr Rishi Raj Trivedi.
- ♦ A function was jointly organized by the local chapter of INSA and IISER Mohali on Feb 11th 2009 to felicitate Prof K N Pathak (Former VC

Panjab university) on his election as an INSA Fellow. A seminar was delivered by Prof K. N. Pathak on the occasion.

- ♦ Science Day was celebrated on February 28, 2009 at IISER Mohali's transit campus. IISER Mohali students organized a science quiz on the occasion for school students from the Chandigarh area.

7.2 Meetings of the Institute Bodies

- ♦ During 2008-2009, various administrative bodies of the Institute met for deliberations.
- ♦ The Board of Governors of IISER Mohali met in the transit campus on April 19 2008 and September 22 2008.
- ♦ The Academic Senate of IISER Mohali met in the transit campus on July 24, 2008 and December 26, 2008.
- ♦ The Finance Committee of IISER Mohali met on April 19 2008 and September 22 2008.
- ♦ The Building & Works Committee of IISER Mohali met on July 10, 2008.
- ♦ The Research Advisory Committee of IISER Mohali met in the transit campus on September 23, 2008.

7.3 New Campus

The master plan for IISER Mohali's new fully residential 125 acre campus coming up in the Knowledge City at Sector 81 Mohali has been finalized. The Ground breaking ceremony was held on December 29, 2008. The construction of the boundary wall commenced thereafter, and is nearing completion. The construction activity for the the Central Analytical Facility building, the first hostel blocks and the first academic block commenced shortly thereafter. The construction agency for IISER Mohali is CPWD. IISER Mohali has augmented its own engineering team by hiring an executive engineer and an assistant engineer. A site office has been established to monitor the construction activity.

7.4 Facilities created/augmented

7.4.1 Computing Facility

A lab has been added for scientific computing in the academic year 2008-09. The lab serves the research needs of various faculty members and research scholars in physics, chemistry, mathematics and biology. Academic licenses for software packages such as the quantum chemistry software Gaussian and symbolic manipulation software such as Mathematica have been purchased and installed in the computing facility at IISER Mohali. The existing wireless LAN facility has been augmented and extended to the entire building in the transit campus.

7.4.2 Library

IISER Mohali Library remains open: Monday-Friday (9am-6pm), Saturday (9am-1pm), Holidays (9am-5pm, except Sundays and 7 national holidays) and during examinations (9am-8pm including Saturdays, Sundays and holidays).

The book collection during the review period was 2329. It includes undergraduate textbooks in mathematics, physics, chemistry and biology, as well as graduate level reference books, research books and monographs. The scientific journal subscription, predominantly online, covers all relevant areas of scientific research including databases, full-text and bibliographic. Further, databases and e-journal subscriptions services are also available through INDEST-AICTE and INFLIBNET. Photocopy facility @50 paise per print is available to students and faculty.

7.4.3 Central Analytical Facility

High-field, high-resolution NMR spectrometers (600MHz and 400MHz) were ordered for IISER Mohali and will be commissioned in the CAF building in the new campus soon. A combined dispersive laser Micro-Raman spectrometer with confocal imaging, Scanning Probe Microscopy (SPM), Atomic Force Microscopy (AFM), Near-field scanning optical microscopy (NSOM) and TIRF microscopy capabilities has been ordered and will be housed in the CAF building soon. A Fourier Transform Infra-Red (FTIR) instrument and a research-grade Fluorimeter have been setup as a part of the instrumentation facility in the transit campus.

7.4.4 Student Amenities

Various student amenities such as a reading hall, music & recreation room, common room, a large-screen TV in the hostel, access to sports facilities, medical facilities etc have been created in the transit campus.

7.4.5 Research Laboratories

A biology research lab and a chemistry research lab have been commissioned, where several faculty members and PhD students work by sharing lab space and resources. The labs have a modern design and take into consideration safety measures and environmental aspects.

7.4.6 Teaching Labs

Name	Number	Capacity
Biology Teaching Lab	1	30
Physics Teaching Lab	1	30
Chemistry Teaching Lab	1	30
Electronics Teaching Lab	1	30

7.4.7 Lecture Rooms

Name	Number	Capacity
Seminar Room	1	75
Conference Room	1	50
Class Room	3	100

7.5 Equipment Procured during Financial Year 2008-09

7.5.1 Biology

S. No. Description

1. Nikon Inverted Microscope
2. 15 Ton hydraulic press PerkinElmer
3. Elisa Reader BioTek
4. Raman-spectroscopy system
5. Near Field Scanning optical microscope
6. Pump with filter assembly Millipore

7. Magnetic stirrer
8. Electronic precision balance
9. MRC Aspirator, Ultrasonic bath
10. Samsung Refrigerator
11. Centrifugal pump 0.5HP
12. Samsung oven
13. LPG gas pipeline
14. Trans Blot SemiDry system
15. Horizontal electrophoresis system
16. UV Trans illuminator
17. Refrigerated tabletop centrifuge
18. Real Time PCR system
19. Refrigerated shaking incubator
20. Gel staining shaker
21. CO2 incubator
22. Orbital waterbath shaker
23. Gel staining shaker
24. Semidry blotting shaker
25. Epson dot matrix printer for elisa reader
26. Kem weighing balance
27. Carl Zeiss microscope
28. Heating oven
29. Advance zoom microscope
30. Electrolux refrigerator 620L
31. Oilheater 11 fins
32. Medicine chiller

33. IKAMAG RET

7.5.2 Chemistry

S. No. Description

1. FTIR spectrometer PerkinElmer
2. Electronic balance 0.01mg
3. Elec. Weighing balance 0.01/0.1mg
4. Sensodirect ph200 meter
5. Horizontal electrophoresis system
6. Thermomixer comfort
7. Rotary Evap and lab vacuum system
8. Samsung refrigerator
9. Hind vacuum pump
10. Analytical balance BT 224S

7.5.3 Physics

S No. Description

1. Oscilloscope Tektronix
2. DC Motor
3. AC Servomotor
4. Constant current power supply
5. Electromagnet
6. Digital Gaussmeter
7. Samsung refrigerator
8. Michelson interferometer
9. Diffusion access probe for 600MHz NMR spectrometer
10. Hall effect equipment
11. Melting point apparatus

8 Academic Programs

In August 2008, 40 students were admitted to the 5-Yr Integrated MS program in Science. These students were admitted based on KVPY and IIT JEE merit list and extended merit list. A total of 07 PhD scholars in physics, biology and mathematics were admitted to the PhD program at IISER Mohali in the academic session beginning August 2008. An additional 11 PhD scholars in physics, chemistry, biology and mathematics were admitted to the PhD program in the winter session beginning January 2009.

9 Events

9.1 Foundation Day Celebrations

9.2 Session on Nobel prizes in science

A set of popular lectures were organized around the theme of the 2008 Nobel prizes in Science on October 29, 2008 at IISER Mohali. Dr Anjan Kumar Giri (Punjabi university Patiala) spoke on the Physics Nobel, Dr Tapan Mukherjee (IISER Mohali) spoke on the Chemistry Nobel, while Dr Jagdeep Singh (IISER Mohali) spoke about the Medicine Nobel.

9.3 Celebration of Science Day

Science Day was celebrated on February 28, 2009 at the transit campus of IISER Mohali. Students of the Integrated 5Year MS program organized a Science Quiz for high school students from Chandigarh area on the occasion.

10 Meetings/Conferences/workshops organized

10.1 DST-PACS meeting

The 5th PAC meeting of Animal Sciences under the aegis of Department of Science & Technology, Ministry of Science & Technology Govt. of India, was organized at the transit campus of IISER Mohali from 19.09.2008 to 20.09.2008. PAC members and PIs attended the session.

10.2 2nd National Level Curriculum Committee Meeting

- ♦ A National level Curriculum Committee was constituted in 2007 by the Director, to draft the course structure for the five year Integrated MS program in Science.
- ♦ The 2nd meeting of the curriculum committee took place during 14-15 November 2008 at IISER Mohali.
- ♦ The committee finalized the structure for the first two (core) years of the program, as well as the detailed course structure, contents and reading lists for the next three years in the core subjects Physics, Chemistry, Biology and Mathematics.

11 Faculty Activity

11.1 Research Activity

Current research in Mathematics at IISER Mohali has focused on dimension subgroups, algebraic structure of group rings, cyclic homology and geometric group theory, as well as the theory of rings and modules. A book and various research papers have emerged out of these specific research directions.

Research in Physics at IISER Mohali currently emphasizes quantum information theory, quantum computing using NMR and statistical mechanics. Specific sub-areas include quantum cryptography and communication, quantum dissipation and decoherence models, quantifying multi-partite entanglement and creating pure states in NMR through selective pulses. Statistical mechanics research emphasizes thermodynamic behaviour of quantum systems, small scale heat engines and non-equilibrium and fluctuations. Concurrent research has been performed on negative refractive indices and imaging effects in folded optical spaces.

Research in Chemistry at IISER Mohali currently focuses on theoretical chemistry, inorganic, organometallic and synthetic organic chemistry as well as materials chemistry and solid-state NMR spectroscopy. Electronic structure and chemical dynamics computations using quantum chemistry packages such as Gaussian (available in IISER Mohali's computing facility) focus on dynamics of elementary chemical reactions, molecular clusters, gas hydrates, heteromolecular clusters, host-guest interactions in endohedral fullerenes and the chemistry of guest species trapped inside nanotubes. Current materials chemistry research focuses on biodiesel synthesis from *Jatropha* oil using metal

oxide catalysts and the study of the effect of nano-sized oxide photocatalysts in biodiesel synthesis. Organic chemistry research is currently focusing on a goal-oriented project to develop anti-malarial drugs using function oriented synthetic mimics for malaria. Solid-state NMR spectroscopy is another tool used by chemists at IISER Mohali to understand the biological implications of structural transformations taking place in proteins and their role in protein related diseases. Synthetic inorganic and organometallic chemistry research is directed toward exploring methods to synthesize heterometallic compounds and develop their applications.

Current research in Biology is being carried out in diverse areas ranging from evolutionary biology to immunology and molecular biology. Specific research activities include inter-sexual conflict, life-history evolution and empirical research using *Drosophila melanogaster*, cytogenetic cloning and experimental evolution. Protein misfolding and amyloid formation is being studied using novel fluorescence labeling chemistry and advanced time-resolved and single-molecule fluorescence spectroscopy and imaging. The structure and dynamics of amyloids and the role of oligomers in amyloid diseases is another emerging area of research at IISER Mohali. Molecular medicine protocols are being used to understand the role of reductive stress and cellular signaling models involved in cell proliferation and cell death.

11.2 Conferences & Invited Talks

1. Dr Samrat Mukhopadhyay gave an invited talk at Fluorescence 2009 International conference on Fluorescence in Biology, TIFR Mumbai March 2009.
2. Dr Dinesh Khurana attended the Conference of the Indian Mathematical Society, University of Allahabad Dec 27-30, 2008.
3. Dr Dinesh Khurana gave an invited talk the Chandigarh Symposium in Mathematics, Panjab University, Chandigarh March 5-6, 2009.
4. Dr Lingaraj Sahu attended a workshop on Infinite Dimensional Analysis and Quantum Probability, Chungbuk National University Korea, January 12-14, 2009.
5. Dr Arvind gave an invited talk at the Workshop on Entanglement in quantum condensed matter systems and the annual K. S. Krishnan meeting, IMSc Chennai 17-18 November 2008.
6. Dr Chanchal Kumar gave an invited talk at the annual meeting of the Indian mathematical Society, University of Allahabad, 26-30 Dec 2008.

7. Dr Chanchal Kumar gave an invited talk at the International Conference in Mathematics, Harish-Chandra Research Institute, Allahabad 16-20 March 2009.
8. Dr Sanjay Singh gave an invited talk at the 3rd midyear CRSI symposium, NIPER-Mohali July 25-26 2008.
9. Dr Sanjay Singh delivered a talk at the first Inter-IISER chemistry meet at IISER-Pune December 22-23 2008.
10. Dr Sanjay Mandal delivered a talk at the first Inter-IISER chemistry meet at IISER-Pune December 22-23 2008.
11. Dr Sanjay Mandal delivered a talk at Third Chandigarh Congress, Panjab University Chandigarh, February 27 2009.
12. Prof Passi delivered a talk at the 23rd Annual Conference of Ramanujan Mathematical Society, IIT Kanpur May 19-21 2008.
13. Prof Passi attended the 78th Annual Session of National Academy of Sciences, Panjab university Chandigarh, 16-18 November 2008.
14. Prof Passi delivered a series of lectures at the Annual Foundation School I, Panjab University, Chandigarh December 2008.
15. Prof Passi attended the International Conference on Quadratic forms, linear algebraic groups and Galois co-homology, University of Hyderabad, 30 Dec 2008-4 Jan 2009.
16. Prof Passi delivered a talk at the 12th Punjab Science Congress, Punjab Agricultural University Ludhiana, 7-9 Feb 2009.
17. Dr Kavita Dorai visited the Structural Biology & Biophysics Dept of Vanderbilt University Nashville USA as an IUSSTF Fellow under the Indo-US Research Scheme from July-October 2008.
18. Dr. Jagdeep Singh attended a workshop on DNA Scanning in the Informatics Center, JNU New Delhi July 2008.
19. Dr. Jagdeep Singh made an oral presentation in the 1st International Biotechnology Society Conference, Sikkim Manipal University, Dec 28-30 2008.
20. Dr M. K. Paul delivered a talk at the 77th Annual Meeting of the Society of Biological Chemists, IITM Dec 18-20 2008.

21. Dr Bharti Bisht delivered a talk at the 77th Annual Meeting of the Society of Biological Chemists, IITM Dec 18-20 2008.
22. Prof N. Sathyamurthy delivered an invited talk at SERC School, NIPER, Mohali, June 30, 2008.
23. Prof N. Sathyamurthy delivered an invited talk at the International Conference and Humboldt Kolleg on Structural Characterization and Spectroscopy of Materials relevant to Nanotechnology, Biomedical and Geobiology, BHU Varanasi, November 6-9, 2008.
24. Prof N. Sathyamurthy delivered an invited talk at 1st Inter IISER Chemistry Meet 2008, IISER Pune, December 22-23, 2008.
25. Prof N. Sathyamurthy delivered an invited talk at Staff College, Guru Nanak Dev University, Amritsar.
26. Prof N. Sathyamurthy delivered an invited talk at Punjab Science Congress, Punjab Agricultural University, Ludhiana, February 7, 2009.
27. Prof N. Sathyamurthy delivered an invited talk at Discussion meeting on Crystal Engineering and Noncovalent Interactions: Contemporary themes and futuristic developments, Orange County, Coorg, February 22-25, 2009.
28. Prof N. Sathyamurthy delivered an invited talk at India-Japan Workshop on Frontiers in Molecular Spectroscopy and Theory, Indian Association for the Cultivation of Science, Jadavpur, Kolkata, March 7-9, 2009.
29. Prof N. Sathyamurthy delivered an invited talk at Department of Chemistry, National Institute of Technology, Jalandhar, Sept. 29, 2008.
30. Shri R. Mishra delivered a lecture as a guest speaker on Creation of Institutional Repositories (IRs) with special reference to P. K. Kelkar Library IIT Kanpur at Library Connect Seminar Elsevier, Hotel Taj, Chandigarh, Aug. 20, 2008.

11.3 Research Publications

1. Harpreet Kaur and Dinesh Khurana, Some characterizations of VNL rings, To appear in Communications in Algebra 2009.
2. Dinesh Khurana, A. Khurana, R. N. Gupta, and T. Y. Lam, Rings over which the transpose of every invertible matrix is invertible, To appear in Journal of Algebra 2009.

3. Dinesh Khurana, G. Marks and A. Srivastava, On unit-central rings, To appear in the Proceedings of Conference on Algebra and Its Applications, Ohio University June 18-21, 2008.
4. I. B. S. Passi and Roman Mikhailov, Lower central and dimension series of groups, Lecture Notes in Mathematics 1952 Berlin:Springer (2009).
5. I. B. S. Passi, S. O. Juriaans, A. C. Souza Filho, Hyperbolic groups and quaternion algebras, Proc. Indian Acad, Sci. (Math. Sci.), 119 9-22, 2009.
6. Arvind, Continuous variable systems:Entanglement, decoherence and quantum cryptography, (Invited review) To Appear in J. Indian Inst. Science Vol 89 Jul-Sept 2009.
7. Deep Jagdeep S and Sidhu Sukhjeet, Methylation pattern of E-cadherin gene as epigenetic biomarker in Lung cancer patients, Res. J. Biotech Vol.3(4):32-34, 2008.
8. Deep Jagdeep S and Sidhu Sukhjeet, Study of Methylation pattern of APC gene as epigenetic biomarker in Lung Cancer Patients, Proc. ISBT, 435-437, 2008.
9. Sobti R.C., Sidhu S, & Deep, Jagdeep S Genetic polymorphism of DNA repair genes (XPC & XPD) in prostate cancer patients of the North Indian population, To Appear in J. Mol. Bio 2009.
10. M. K. Paul, R. Tripathy & A. K. Mukhopadhyay, Miltefosine as a potent inhibitor of plant tubulin polymerization, Intl J Biochem and Biotech, (In press) 2008.
11. M. K. Paul, R. Verma, R. Tripathy, A. Nayyar, R. Jain, & A. K Mukhopadhyay, Bacterial DNA Gyrase is not the target of Quinoline-based anti-tuberculosis compounds, Indian J Pharmacology (In Press) 2008.
12. M. K. Paul, R. Kumar & A. K. Mukhopadhyay, Characterization of rat liver mitochondrial permeability transition pore, African J Pharmacy & Pharmacology, Vol2: 014-021, 2008.
13. M. K. Paul & Bharti Bisht, "Cell Respiration: Processes, Types and Effects" Invited Book Chapter, Nova Science Publishers, NY 2009.
14. S. Guenneau and S. Anantha Ramakrishna, Negative refractive index, perfect lenses and checkerboards: Trapping and imaging effects in folded optical spaces, C.R.Physique, In Press 2009.

15. S. Anantha Ramakrishna and A. Lakhtakia, Spectral shifts in the properties of a periodic multilayered stack due to isotropic chiral layers, *J. Opt. A: Pure Appl. Opt.* Vol 11, 074001, 2009.
16. B. K. Mishra, V. K. Bajpai, V. Ramanathan, S. R. Gadre and N. Sathyamurthy, Cation- π interaction: To stack or to spread, *Mol. Phys.* 106 (2008) 1557-1566.
17. M. Elango, V. Subramanian, A. P. Rahalkar, S. R. Gadre, N. Sathyamurthy, Structure, Energetics and Reactivity of Boric Acid Nanotubes: A Molecular Tailoring Approach, *J. Phys. Chem. A* 112(2008)7699-7704.
18. C. N. Ramachandran, D. Roy and N. Sathyamurthy, Host-guest interaction in endohedral fullerenes, *Chem. Phys. Lett.* 461(2008)87-92.
19. M. Elango, V. Subramanian and N. Sathyamurthy, The self-assembly of metaboric acid molecules into bowls, balls and sheets, *J. Phys. Chem. A* 112(2008)8107-8115
20. Structure and Stability of Water Chains $(H_2O)_n$, $n = 5 - 20$, R. Parthasarathi, M. Elango, V. Subramanian and N. Sathyamurthy, *J. Phys. Chem. A* 113(2009)3744-3749
21. CD-ROM collection management and development of a web interface by using WINISIS/Genesis at P. K. Kelkar Library IIT Kanpur, R. Mishra, Rajesh Kumar and D. P. Tripathi, *Ann. Lib. Info. Studies* 55(2008)265-274

12 Visits by Foreign Scientists

Prof. Antonio Varandas, a theoretical chemist from the University of Coimbra, Portugal visited IISER Mohali in the first week of February 2009 and delivered an institute colloquium titled "Eight decades of Born-Oppenheimer approximation".

Prof. J. Manz, a theoretical chemist from Freie Universitaet Berlin, Germany visited IISER Mohali on April 07, 2008 and delivered an institute colloquium titled "Quantum dynamics simulations for laser pulse control of photochemical processes".

13 On-going Sponsored Research Projects

1. **Project Title:** “Conformational Dynamics of Model Tripeptides using NMR and Vibrational Spectroscopic Techniques”

Funding Agency	:	DST (Under Fast Track Scheme)
PI	:	Dr. Kavita Dorai (IISER Mohali)
Duration	:	2007-2010
Amount	:	5.7 Lakhs

2. **Project Title:** “Studies of dissipative dynamics in quantum computers using NMR techniques”

Funding Agency	:	CSIR
PI	:	Dr. Kavita Dorai (IISER Mohali)
Co-PI	:	Dr. Arvind (IISER Mohali)
Duration	:	2007-2010
Amount	:	3.29 Lakhs

3. **Project Title:** “Exploring biomolecular dynamics using cross correlated spin relaxation in NMR”

Funding Agency	:	DBT
PI	:	Dr. Kavita Dorai (IISER Mohali)
Co-I	:	Dr. P. B. Sunil Kumar (IIT-Madras)
Duration	:	2007-2010
Amount	:	53.04 Lakhs

4. **Project Title:** “Bio-molecular Solid-State NMR-Theory, Experiments and Application”

Funding Agency	:	DST
PI	:	Dr. Ramesh Ramachandran (IISER Mohali)
Duration	:	2009-2012
Amount	:	34.804 Lakhs

5. **Project Title:** "Unraveling the importance of Receptor for Advanced Glycation End Products Signaling in Breast Cancer Development and Drug Resistance"

Funding Agency	: ICMR
PI	: Dr. Tapan Mukherjee (IISER Mohali)
Duration	: 2008-2011
Amount	: 6.99 Lakhs

6. **Project Title:** "Modern science in India:Colonial compulsions nationalist aspirations and global conventions"

Funding Agency	: CSIR
PI	: Dr. R. Kochhar (IISER Mohali)
Duration	: 2008-2011
Amount	: 3.83 Lakhs

14 Institute Colloquia

- ♦ 24th February 2009 (Tue 3:00 pm) Prof. S. P. Singh (University of Western Ontario, Canada and BHU, Varanasi) "Ky Fan's best approximation theorem and applications".
- ♦ 18th February 2009 (Wed 4:00 pm) Prof. Roddam Narasimha (JNC SAR & Univ of Hyderabad) "The Queen of the Tropical Sky:The fluid dynamics of the cumulus cloud".
- ♦ 11th February 2009 (Wed 4:00 pm) Prof. K. N. Pathak (Vice Chancellor Punjab University, Chandigarh) "Current fluctuations in ideal quantum gases".
- ♦ 6th February 2009 (Fri 5:00 pm) Prof. G. Krishnamoorthy (TIFR, Mumbai) "Molecular motion is essential for life".
- ♦ 2nd February 2009 (Mon 5:00 pm) Prof. Antonio Varandas (University of Coimbra, Portugal) "Eight decades of Born-Oppenheimer approximation".
- ♦ 20th November 2008 (Thu 5:00 pm) Dr. Anil Kumar (IISc., Bangalore) "NMR a versatile technique for biomolecular structure determination, MRI and Quantum Computing".
- ♦ 19th November 2008 (Wed 4:00 pm) Prof. Sanjay G. Dhande (Director IIT, Kanpur) "Beauty in Geometry".

- ♦ 4th November 2008 (Tue 4:00pm) Prof. Anantha Padmanabhan (Former Director, IIT Kanpur) "Studies on the optical and opto-electronic properties of stoichiometric and non-stoichiometric TiN/TiN_x".
- ♦ 19th September 2008 (Fri 5:00 pm) Prof. Vinod Kumar (University of Lucknow) "Keeping Life on Time: Avian Perspective".
- ♦ 17th September 2008 (Wed 4:00 pm) Prof. Amitabh Joshi (JNCASR Bangalore) "Metapopulation Dynamics in the Laboratory".
- ♦ 10th September 2008 (Wed 4:00 pm) Dr. Mangala Sunder (IIT Madras) "Microwave Spectroscopy of Non-rigid van der Waals complexes and Stark effect".
- ♦ 9th September 2008 (Tue 5:00 pm) Dr. Swami Budhananda "Renaissance in science in the post modern era".
- ♦ 5th September 2008 (Fri 4:00 pm) Prof. H. S. Mani (Chennai Mathematical Institute) "Sling shot effect of satellites".
- ♦ 2nd September 2008 (Tue 4:00 pm) Prof. Krishna N. Ganesh (Director IISER, Pune) "Excitements in Chemical Sciences: The new age of molecules".
- ♦ 20th August 2008 (Wed 4:00 pm) Prof. Dipankar Chatterji "A tiny molecular machine and the central dogma of molecular biology".
- ♦ 19th August 2008 (Tue 10:00 am) Prof. Bidyendu M. Deb (IISER, Kolkata) "An Experiment in Nonlinear Dynamics: Coalescence of all Basic Sciences".
- ♦ 29th July 2008 (Tue 4:00 pm) Dr. K. S. Viswanathan (IGCAR, Kalpakkam) "Spectroscopy in cryogenic matrices: From conformations to high temperature chemistry".
- ♦ 25th July 2008 (Fri 2:30 pm) Dr. Harjinder Singh (III-T, Hyderabad) "Controlling nuclear motion in molecules".
- ♦ 9th April 2008 (Wed 4:00 pm) Dr. Bhanu Das (IIA, Bangalore) "Atoms as Probes of the Unification of Fundamental Forces".
- ♦ 7th April 2008 (Mon 5:00 pm) Prof. Joern Manz (Freie Universitaet Berlin) "Quantum dynamics simulations for laser pulse control of photochemical processes".

- ♦ 2nd April 2008 (Wed 4:00 pm) Dr. P. B. Sunil Kumar (IIT, Madras) "Modeling biological membranes and the cytoskeleton".

15 Technical Seminars

- ♦ March 24, 2009 (Tue 4:00 pm) Dr. Joydeep Bhattacharjee (Lawrence Berkeley National Lab, USA) "Towards development of new electronic structure methodologies and designing functional nano materials".
- ♦ March 23, 2009 (Mon 5:00 pm) Dr. Siddartha Lal (University of Illinois at Urbana-Champaign, USA) "Mixed edges and inhomogeneous quantum Hall systems".
- ♦ March 23, 2009 (Mon 4:00 pm) Dr. Priyadarsi De (PhaseRx Pharmaceuticals, Seattle, WA, USA) "Advanced Materials by Living/Controlled Polymerization".
- ♦ March 20, 2009 (Tue 4:00 pm) Dr. Jayanta Haldar (Massachusetts Institute of Technology, USA) "Infectious Diseases: the ways to tackle".
- ♦ March 17, 2009 (Tue 4:00 pm) Dr. Basant K Patel (University of Illinois at Chicago, USA) "Yeast Prions: Replication elements for Protein-only genetic inheritance".
- ♦ March 16, 2009 (Mon 5:00 pm) Dr. Sujit Kumar Ghosh (BITS-Pilani Goa Campus) "Single-molecule interfacial electron transfer dynamics in dye sensitized TiO₂ nanoparticles".
- ♦ March 16, 2009 (Mon 4:00 pm) Dr. Sasmita Barik (IMA, Bhubaneswar) "On Nonsingular Trees And A Reciprocal Eigenvalue Property".
- ♦ March 16, 2009 (Mon 3:00 pm) Dr. Surjeet Singh (Universite Paris-Sud, Orsay, France) "Single-crystal growth and physical properties of some oxide compounds of pyrochlore and cuprate families".
- ♦ March 13, 2009 (Thu 4:00 pm) Dr. Sanjit Konar (Universitat Bielefeld, Germany) "Porous Capsules and Encapsulation Chemistry: Perspectives of Chemistry under Confined Conditions".
- ♦ March 5, 2009 (Thu 3:00 pm) Dr. Shubhrangshu Dasgupta (University of Toronto, Canada) "Quantum control by quantum interference".
- ♦ March 5, 2009 (Thu 12:00 Noon) Dr Balaji Prakash (IIT, Kanpur)

"GTPases in Ribosome Biogenesis: A tale of a unique protein EngA".

- ♦ March 4, 2009 (Wed 3:00 pm) Dr. A. Kundagrami (UMass Amherst, USA) "Physics of charged polymers: their properties as soft materials".
- ♦ March 4, 2009 (Wed 11:00 am) Prof. Dipendra Prasad (TIFR, Mumbai) "Classical group".
- ♦ March 3, 2009 (Tue 4:00 pm) Dr. R. Arun (Physical Research Laboratory, Ahmedabad) "Quantum Interferences in Resonance Fluorescence".
- ♦ 27th February 2009 (Fri 4:00 pm) Dr. Anjan Chakraborty (Florida State University, USA) "Dynamics of Solvent Relaxation and Photoinduced Electron Transfer in Organised Assemblies and Spectroscopic State of Vitamin D Field Photochemistry".
- ♦ 26th February 2009 (Thu 5:00 pm) Dr. Rajeev Kapri (TIFR, Mumbai) "Unzipping an Adsorbed Polymer and DNA by Force".
- ♦ 26th February 2009 (Thu 4:00 pm) Dr. Anirban Roy (Assam University, Assam) "Distinguishability and cloning by Local operation and classical communication".
- ♦ 25th February 2009 (Wed 4:00 pm) Dr. Sudip Barman (University of Alberta, Canada) "Molecular Electronics: Conducting Polymer Memory Devices Based on Dynamic Doping".
- ♦ 24th February 2009 (Tue 4:00 pm) Dr. Shaibal K Sarkar (University of Colorado, Boulder, USA) "Semiconductor Sensitized Solar Cells: Aspects of Different Deposition Techniques".
- ♦ 18th February 2009 (Wed 12:00 Noon) Prof. Roddam Narasimha (JNCASR Bangalore) "Yukti: The philosophy of Classical Indic Science".
- ♦ 18th February 2009 (Wed 12:00 Noon) Dr. Kshudiram Mantri (National University of Singapore) "Ferric salt hydrates as catalysts for the esterification of fatty acids with fatty alcohols".
- ♦ 17th February 2009 (Tue 5:00 pm) Dr. Inamur R. Laskar (BITS Pilani) "Phosphorescent Materials for Efficient Organic Light Emitting Diodes".
- ♦ 17th February 2009 (Tue 4:00 pm) Dr. Varadharajan Srinivasan (University of California, Berkeley, USA) "Probing the origins of

adsorption-induced surface stresses in nano-mechanical cantilever sensors from first-principles".

- ♦ 17th February 2009 (Tue 3:00 pm) Dr. Kunwar Pal Singh (IIT Delhi) "Modeling of Dielectric Barrier Discharge plasma actuator for separation control in aerodynamics".
- ♦ 16th February 2009 (Mon 5:00 pm) Dr. Rajesh Mishra (Dortmund University of Technology, Germany) "Amyloid Proteins and Diseases".
- ♦ 30th January 2009 (Fri 4:00 pm) Dr. Raj Kumar (University of Maryland, USA) "Design and Synthesis of Novel Ring Expanded Heterocycles and their Corresponding Nucleosides as Potential Chemotherapeutic Agents for Cancer and Viral Diseases".
- ♦ 28th January 2009 (Wed 3:00 pm) Dr. Manisha Yadav (Lund University, Sweden) "Bacterial TIR-domains as virulence factor in urinary tract infection".
- ♦ 2nd January 2009 (Fri 4:00 pm) Dr. Kiran Sankar Maiti (Technische Universitat Munchen, Germany) "A challenge to explore structure and ultrafast dynamics of protein and peptide using 2D IR spectroscopy".
- ♦ 30th December 2008 (Tue 3:30 pm) Dr. Satyendra Tomar (RICAM Austria) "Cost effective guaranteed a posteriori error estimates for discontinuous Galerkin approximations".
- ♦ 11th December 2008 (Thu 4:00 pm) Dr. S. Shankaranarayanan (University of Portsmouth, UK) "Inflation driven by a Bose-Einstein condensate".
- ♦ 10th December 2008 (Wed 12:00 pm) Prof. R. S. Kulkarni, (IIT, Bombay) "Some algebra and geometry of quaternions".
- ♦ 2th November 2008 (Wed 4:00 pm) Dr. Jayendra Nath Bandyopadhyay (MPI-PKS Dresden, Germany) "Quantum Signatures of Chaos : Entanglement and 1/f Noise".
- ♦ 10th November 2008 (Mon 4:00 pm) Dr. Chayan Kanti Nandi (Goethe Universitat, Germany) "Spectroscopic investigation on the binding of biomolecular complexes in solution and in ultra-cold gas phase".
- ♦ 5th November 2008 (Wed 5:00 m) Dr R. P. Singh (PRL, Ahmedabad) "Optical Vortices: Light Beams with Helical Wavefront".

- ♦ 4th November 2008 (Tue 3:00pm) Dr. Samrat Mukhopadhyay (Scripps Research Institute, La Jolla, California) "Prying into a Self-replicating Prion Amyloid".
- ♦ 3rd November 2008 (Mon 4:00 pm) Dr. Kailash Chand Pandey (SFGH-UCSF, San Francisco, USA) "Structure-Function Analysis of Malarial Cysteine Proteases-Falcipains."
- ♦ 29th October 2008 (Wed 5:00 pm) Dr. Tapan Mukherjee (IISER Mohali) "Nobel Prizes 2008 A Session (Chemistry Nobel)".
- ♦ 29th October 2008 (Wed 4:30 pm) Dr. Jagdeep Singh (IISER Mohali) "Nobel Prizes 2008: A Session (Medicine Nobel)".
- ♦ 29th October 2008 (Wed 4:00 pm) Dr. Anjan Kumar Giri (Punjabi University) "Nobel Prizes 2008: A Session (Physics Nobel)".
- ♦ 22nd October 2008 (Wed 3:00 pm) Dr. Renu Garg (University of North Carolina) "Soybean based Oral Vaccine against Staphylococcus Enterotoxin B".
- ♦ 3rd October 2008 (Fri 4:00 pm) Dr. U. Lourderaj (Texas Tech University, USA) "Computational Studies of Dynamics of Chemical Reactions".
- ♦ 3rd October 2008 (Fri 3:00 pm) Prof. Prabodh Pol and Dr. Srinivas Kelkar (Pune Univ.) "Microscale Experiments in Chemistry".
- ♦ 1st October 2008 (Wed 4:00 pm) Dr. Sarika Jalan (MPI-PKS Dresden, Germany) "Coherence at different levels: Synchronization, Symbolic synchronization and all that!".
- ♦ 18th September 2008 (Thu 5:15 pm) Prof. Amitabh Joshi (JNCASR Bangalore) "Shaikh Mohammad Iqbal: His Life, Poetry and Thoughts".
- ♦ 11th September 2008 (Thu 11:00 am) Dr. Praful S. Singru (Tufts Medical Center Boston USA) "Melanocortin signaling system operates the hypothalamic neural circuitry to regulate food intake, satiety and energy expenditure".
- ♦ 2nd September 2008 (Tue 10:00 am) Dr. Ramesh Ramachandran (IIT, Roorkee) "Solid-state NMR? where Physics meets Chemistry and ♦ Biology".
- ♦ 2nd September 2008 (Tue 9:00 am) Dr. Devdutt Chaturvedi (RRL, Jammu) "Synthetic Methodologies for bioactive molecules".

- ♦ 27th August 2008 (Wed 4:00 pm) Dr. Bindiya Arora (GNDU Amritsar) "Modeling of atomic systems for atomic clocks and quantum information".
- ♦ 27th August 2008 (Wed 3:00 pm) Dr. Karunesh Arora (University of Michigan, USA) "Mechanistic role of Adenylate Kinase and Dihydrofolate reductase conformational dynamics illuminated via its energy landscape investigations".
- ♦ 18th August 2008 (Mon 5:00 pm) Prof. Bidyendu M. Deb (IISER, Kolkata) "Glimpses Into the Magical World of Chemistry".
- ♦ 11th August 2008 (Mon 4:00 pm) Dr. Dibyendu Bhattacharyya (Univ. Chicago) "Deciphering the transition ER-Sites".
- ♦ 8th August 2008 (Fri 4:00 pm) Dr. Abhijeet Bardapurkar (HBCSE Mumbai) "Causality in Darwin's theory and a tale of misplaced metaphors".
- ♦ 6th August 2008 (Wed 4:00 pm) Dr. Kapil Krishan (Univ. Marne-La-Vallee France) "Molecular to macroscopic instabilities in fluid flows".
- ♦ 17th July 2008 (Thur 11:00 am) Dr. Tarkeshwar Gupta (Weizmann Institute of Science, Israel) "Molecular-based Monolayer and Multilayer thin film Switches, Sensors, Communication and Boolean Logic Integration".
- ♦ 3rd July 2008 (Thur 4:00 pm) Dr. Lingaraj Sahu (ISI Bangalore) "Characterization of unitary Processes with independent and stationary increments".
- ♦ 2nd June 2008 (Wed 4:00 pm) Dr. Manish Shrimali (Dayanand College Ajmer) "Chaos and Information Processing".
- ♦ 13th June 2008 (Fri 3:00 pm) Dr. Amit Kulshrestha (ISI, Delhi) "Do subfields determine everything about quaternion algebras?".
- ♦ 12th June 2008 (Thu 4:00 pm) Dr. S. Chakraverty (CBRI Roorkee) "Boundary Characteristic Orthogonal Polynomials and other New Modeling Methods in Vibration Problems".
- ♦ 12th June 2008 (Thu 3:00 pm) Dr. Chanchal Kumar (University of Jammu) "Cellular Resolution of Generalized Permutohedron Ideals".
- ♦ 11th June 2008 (Wed 4:00 pm) Dr. Ramesh C Sharma (Univ of

- Manchester) "Novel laser spectroscopic techniques and reaction Dynamics in vapour phase".
- ♦ 9th June 2008 (Mon 4:00 pm) Dr. Manoj K. Yadav (HRI Allahabad) "Some Problems in Automorphisms of Finite p-Groups".
 - ♦ 4th June 2008 (Wed 11:00 am) Dr. Kapil Sharma PU Chandigarh "Numerical Analysis of Boundary Value Problems for Singularly Perturbed Differential Difference Equations".
 - ♦ 4th June 2008 (Wed 10:00 am) Dr. Baljit Singh "Wave Propagation in Elastic Solids".
 - ♦ 28th May 2008 (Wed 4:00 pm) Dr. Neeladri Das (UC Irvine USA) "Coordination driven self-assembly of discrete supramolecular structures".
 - ♦ 22nd May 2008 (Thu 4:00 pm) Dr. Rajendra Srivastava (Hokkaido Univ. Japan) "Nanoporous Materials for Catalysis".
 - ♦ 19th May 2008 (Mon 4:00 pm) Dr. Ashish Kumar (Oxford Univ.) "Bioinformatics and its application in post genomic era".
 - ♦ 9th May 2008 (Fri 4:00 pm) Dr. Pranay Goel (Ohio State University) "Glucose sensing in pancreatic islets: a modern perspective".
 - ♦ 24th April 2008 (Thr 4:00 pm) Dr. Alok Sharan (Pondicherry University) "Nonlinear Optics in Ferroelectrics : Use as a probe and some applications".
 - ♦ 17th April 2008 (Thr 11:00 am) Dr. Sai Jagan Mohan (Strand Life Sciences, Bangalore) "Symmetry in buckling analysis of domes and shells".
 - ♦ 16th April 2008 (Wed 10:00 am) Dr. Ramandeep S. Johal (Lyallpur Khalsa College, Jalandhar) "Maximum Work Extraction in Quantum Heat Engines".
 - ♦ 10th April 2008 (Thr 3:00 pm) Dr. Senthil Kumar Venugopal (UC Davis Medical Center, Sacramento USA) "Alternate therapies for liver damage treatment".
 - ♦ 1st April 2008 (Tue 3:00 pm) Dr. Rakesh Singh (Lund University, Sweden) "Understanding leukemia associated ETO homologues".

16 Accounts Statement

The Annual Statement of Accounts of the Institute has been prepared in the prescribed format (Form of Financial Statement Non- Profit Organization). This includes the Balance Sheet, Income & Expenditure Account and Receipt & Payment Account. The provision of Depreciation has been made as per the advice of the audit in the Accounts 2008-09 (as and where applicable). The Institute from the next financial year will also adopt pre-audit system as advised by the Statutory Audit while auditing the Annual Statement of Accounts 2007-08. However in the current Financial year the Statement of Accounts of the Institute is audited by a Chartered Accountant firm of Chandigarh (Prem Garg & Associates).

16.1 Plan Grant

The Institute has received a sum of Rs. 3275.00 Lakh as Grant-in-Aid from MHRD in the Year 2008-09. As per utilization certificate on account of 2007-08 there is an opening balance of Rs. 92.97 Lakh. Out of the total amount of Rs. 3367.97 Lakh (Rs.3275.00 Lakh + Rs. 92.97 Lakh) available under plan, the following expenditure has been made under different budget heads in 2008-09.

Budget Head		(Rs. in Lakh)
(i)	Salary Component	: 152.85
(ii)	Non- Salary Component	: 336.24
(iii)	Purchase of Equipment	: 522.99
(iv)	Purchase of Furniture	: 52.29
(v)	Purchase of One Vehicle	: 4.26
(vi)	Construction of Building (Including Deposit money)	: 2182.64
(vii)	Library Books	: 15.40
(viii)	Computers Accessories & Peripherals	: 20.64
Total		3287.31

The Institute has its internal receipts of Rs. 33.73 Lakh from Student Fee, Rs. 44.07 Lakh from Interest on Fixed Deposit & Rs. 3.23 Lakh from other resources under Plan head (in 2008-09).

16.2 Research & Development Grant

In addition to the Plan Grant, the Institute also received a sum of Rs. 101.91 Lakh (in 2008-09) under Research and Development Account (with an opening balance of Rs. 5.20 Lakh carried over from 2007-08). In case of Research and Development (R & D) A/c, the details are here under:-

Income:

	(Rs. in Lakh)
(i) Opening Balance as on 01.04.08	5.20
(ii) Grant received in 2008-09	101.91
(iii) Interest received	1.36
Total	108.47

Expenditure:

(i) Pay and Allowances	0.83
(ii) TA	9.09
(iii) Scholarship	31.80
(iv) Admin. Expenses	0.06
(v) House Keeping Charges (Guest House Charges)	0.81
(vi) Purchase of equipment	33.18
Total	75.77

Thus, total amount available was Rs. 108.47 Lakh, out of which Rs. 75.77 Lakh is spent under R & D A/c with a closing balance of Rs. 32.71 Lakh. Under the other receipt and expenditure heads, the amount received and expenditure incurred are as per sanction of the funding agencies. On the basis of the observation of the Statutory Audit, the Institute has prepared Annual Statement of Accounts (2008-09) which has been audited by Prem Garg & Associates, a firm of Chartered Accountants of Chandigarh. The Depreciation in Accounts (as advised by the Statutory Audit and the Board) has also been taken into account. The Accounts have been prepared in proper format as prescribed by the Govt. of India.

16.3 Endowment Fund

Guidelines for the creation of an Endowment Fund for IISER Mohali were approved by the Board of the institute. Private agencies or individuals or others who do not fall into the categories of nationally recognized Foundations or agencies, can institute scholarships, medals and prizes through endowment funds - funds that provide a permanent means to award scholarships to deserving and meritorious students. The creation of an endowment fund will be possible through a deposit by the donor of a minimum of Rs. 50,000/- with the Institute which will be deposited in a bank under a fixed deposit scheme. The interest earned on it may constitute the quantum of scholarship. The first such fund was created by Mr. Kaul from Chandigarh and the scholarship will be given to the best performing student of IISER Mohali.