

Director's Report

In 2006-07, Harish-Chandra Research Institute (HRI) has made good, consistent progress towards its goal of achieving further excellence in the fields of mathematics and theoretical physics. The research and training activities of HRI have attracted much national and international attention manifested through important publications, invitations for collaborative work, conference invitations, etc. Among prospective Ph.D. students, HRI is one of the most coveted in the country. There are also many applications from outside the country for post-doctoral positions at the Institute.

The Department of Atomic Energy (DAE), Government of India, which financially supports HRI, has research in basic science as a major component of its R&D sector. HRI is a prominent member of the group of DAE institutes and is known for its specialised, high quality expertise. HRI is very much on the way of setting up closer linkages with other DAE institutions through the Homi Bhabha National Institute (HBNI) to which all the newer Ph.D. students are enrolled. DAE has approved the Annual Plan allocation in BE 2007-08 (XIth Plan) amounting to a total of 18.46 Crores. Work on the different XIth Plan projects have started in right earnest and much activity is foreseen in the year ahead.

The Institute is undergoing an External Peer Review to assess its progress and to identify directions for future development. Part I of this Review took place in February 2007 and was undertaken by a panel consisting of Professors M.S. Narasimhan (TIFR, Bangalore), Jean-Marc Deshouillers (Bordeaux, France), and Joseph Oesterlé (Paris, France). It saw an unprecedented level of coordination and cooperation between one and all at the Institute. Part II of the Review will take place in November 2007 and a combined report on the two Reviews will be submitted by the expert panel.

The members of the Institute have continued to win laurels from India and abroad. Let me list some of those:

- Professor Ashoke Sen was awarded the J.C. Bose fellowship of the Department of Science and Technology.
- Professor Rajesh Gopakumar was chosen for the Swarnajayanti Fellowship of the Department of Science and Technology and also for the ICTP Prize for 2006 by the Abdus Salam International Centre for Theoretical Physics, Trieste (Italy).
- Dr. Srubabati Goswami was awarded the Dr. P. Sheel Memorial (Young

Woman Scientist) Lecture award of 2006 by the National Academy of Sciences, India. This award is made once every three years.

- Professor Biswarup Mukhopadhyaya was elected a Fellow of the National Academy of Sciences, India.

The Birth Centenary of Sri Girdharilal-ji Mehta – to whose vision and generosity this Institute owes its very origin – was celebrated through a one-day programme on December 07, 2007 organized jointly with the Bharatiya Vidya Bhavan. The well-attended programme was held at the Prayag Sangit Samiti auditorium in Allahabad. Professor Ram Murty of Queen’s University, Canada gave a talk on ‘Logic, Number Theory, and the Limits of Human Reason’. Professor M.S. Raghunathan, Chairman, HRI Governing Council chaired the programme. It was a privilege that Professor R. Balasubramanian, Member, HRI Governing Council, also graced the occasion by his presence. Professor Ram Murty’s Lecture is the first HRI Girdharilal Mehta Lecture of HRI. We expect to make this into a continuing series and arrange more such lectures of wide interest by prominent academicians.

With the approval of the Council and the Building Works Committee, for a long-time discussions were continuing with the Uttar Pradesh Power Corporation Limited (UPPCL) to secure an uninterrupted 33kV power connection for HRI. I am happy to report that these discussions have now borne fruit after several meetings with the DGM of UPPCL and other officials. It is expected that the uninterrupted power supply will become available within the next year.

During the last year, Mr. P.B. Chakraborty has joined the Institute as Registrar. We welcome him to HRI and hope that the Institute will greatly benefit from his past administrative experience. Mr. Chakraborty took over from Mr. M.P. Shrivastav who served as the Acting Registrar. I would like to express my thanks to Mr. M.P. Shrivastav for taking over as Acting Registrar at short notice and helping the Institute function smoothly in the transition phase.

Mr. R.D. Maurya retired from the Institute on 31.12.06 after serving the Institute for several decades.

I now give a brief summary of the meetings, lectures, etc. which were held at the Institute during 2006-07.

- **Scientific meetings:**

1. HRI took the responsibility of organising the first INO Training School. It was held during 10th to 25th April 2006.
2. An international conference was held during 1st - 5th December 2006 on Number Theory. About 40 participants attended the conference from India and abroad.
3. An informal workshop on String Theory was organized from 7th to 10th December 2006. About 15 scientists from India and abroad attended this workshop.
4. A Topical meeting on Physics at the LHC was held from 16th to 21st December 2006. For the first time at HRI, this meeting arranged a remote video lecture presentation when one of the invited speakers from abroad had to change plans at the last moment.
5. An international conference on Number Theory & Cryptography was held during 23rd - 27th February 2007. About 35 participants from outside and 25 from the Institute attended the conference.

- **Visitors to the Institute:**

Professors Soumitra Sengupta (IACS, Kolkata), D. Bhattacharjee (NEHU, Shillong), I. Baoulina (IMSc, Chennai), A.K. Mishra (IMSc, Chennai), J. K. Bhattacharjee (IACS, Kolkata), K. Subramanian (IUCAA, Pune), Kamal Datta (Delhi University), Somdatta Sinha (CCMB, Hyderabad), Roy Joshua (Ohio University, USA), W. Krawcewicz (University of Alberta, Canada), Otto Kong (National Central University, Taiwan), N.P. Skoruppa (University of Siegen, Germany), A. Gopakumar (Theor. Phys. Institut, Jena, Germany), K. Narayan (TIFR, Mumbai), Jayajit Das (MIT, Mumbai), D. Prasad (TIFR, Mumbai), K. Varadarajan (University of Calgary, Canada), R. Nityananda (NCRA, Pune), S. Loktev (ITEP, Moscow), Arunansu Sil (Saclay, France), Niklas Beisert (Albert Einstein Institute, Potsdam), Maury Goodman (Argonne National Lab, USA), Arijit Bhattacharya (University of Padova, Italy), Debaprasad Maity (IACS, Kolkata), Hidekazu Furusho (Nagoya University), Subir K. Das (University of Maryland, USA), T. Roychoudhury (CTS, IIT Kharagpur), Basudeb Datta (IISc, Bangalore), Henri Darman (McGill University, Canada), T. Senthil (IISc, Bangalore) and T. N. Shorey (TIFR, Mumbai) were among the visitors to the Institute.

- **HRI Girdharilal Mehta Lecture:**

1. Professor Ram Murty: 07.01.07 – Logic, Number Theory, and the Limits of Human Reason

2. Professor Joseph Oesterlé: 19.03.07 – Why do Antennas emit Waves?

• **HRI Colloquia:**

1. J.K. Bhattacharjee: 10.4.06 – Divergent Critical Viscosity: Convergent Theory and Experience.
2. K. Subramanian: 21.4.06 – Magneto-Genesis in the Universe.
3. Kamal Datta: 27.4.06 – Einstein, Classical and Modern: Atomism, Relativity and Quantum Mechanics.
4. Somdatta Sinha: 16.5.06 – Modelling Biological Systems.
5. Ram Ramaswamy: 18.9.2006 – Finding genes (and other things) in DNA sequences: Mathematical methods for genomic analysis.
6. Tarun Souradeep: 27.10.2006 – Celebrating the Cosmic Microwave Background.
7. Swara Ravindranath: 6.11.2006 – Observational Constraints on Galaxy Formation from Deep Surveys.
8. Nils-Peter Skoruppa: 27.11.2006 – On the Physics of the Rogers-Ramanujan Identities.
9. Yuval Gefen: 4.12.206 – How to measure a fractional statistical phase.
10. T. Senthil: 6.12.2006 – Quantum criticality beyond the Landau-Ginzburg-Wilson paradigm.
11. Debashish Chowdhury: 11.12.2006 – Interacting self-propelled particles: from molecules to vehicles.
12. Gyan Bhanot: 22.12.2006 – Inferring Common Origins: How clustering and principal component analysis reveal the migration history of humans out of Africa.
13. Maury Goodman: 22.12.2007 – The Neutrino Oscillation Industry.

• **Physics Colloquia:**

1. A. Gopakumar: 29.1.2007 – Gravitational Wave Astronomy.

• **Lecture Series:**

1. Dr. Ioulia Baoulina, IMSc, Chennai, visited during 8.4.06 to 7.5.06 and gave a lecture On diagonal equations over finite fields.
2. Dr. A.K. Mishra, IMSc, Chennai, visited during 16.4.06 to 1.5.06 and gave two lectures on Metal-Insulator transition in an adsorbed layer at an Electrochemical interface and Ortho-fermi Quantum Statistics and its applications to the Infinite-U Hubbard Model.

3. Prof. Soumitra Sengupta, IACS, Kolkata, visited during 26.5.06 to 2.6.06 and delivered a lecture on Stability and Hierarchy Problems in a Back-reacted Randall-Sundrum braneworld.
4. Professor Peter West, King's College, London, visited during 19.9.06 to 3.10.06 and delivered a lecture series on E11 and the Symmetries of M-Theory.
5. Professor T.N. Shorey, TIFR, Mumbai, visited during 6.11.06 to 8.12.06 and delivered a lecture series on Linear forms in logarithms and its applications.
6. Professor Roy Joshua, Ohio University, USA, visited during 4.1.07 to 21.1.07 and delivered a lecture series on Etale Cohomology.
7. Professor W. Krawcewicz, Univ. of Alberta, Edmonton, Alberta, Canada, visited during 12.1.07 to 19.1.07 and delivered a lecture series on Equivariant Degree and its applications.
8. Professor Otto Kong, National Central University Taipei, Taiwan, visited during 20.1.07 to 25.1.07 and delivered a lecture on Towards the theory of Special Quantum Relativity.
9. Professor S.T. Petcov, SISSA, Trieste, Italy visited during 21.1.07 to 24.1.07 and delivered a lecture on Leptogenesis and Low Energy CP-Violation in the Lepton Sector.
10. Professor Werner Rodejohann, Max-Planck-Institute fur Kernphysik, Germany visited during 21.1.07 to 24.1.07 and delivered a lecture on Structure of Neutrino Mixing and Quark-Lepton Complementarity.
11. Professor J. Oesterlé, Institut Henri Poincare, Universite Paris VI, France, visited during 2.2.07 to 2.4.07 and delivered a series of ten lectures on Moduli space of genus zero curves with n marked points.

• **Other Activities and Events:**

1. Like other years, the Visiting Students' Summer Programme (VSSP) for B.Sc. and M.Sc. students was organised in 2006. The Mathematics VSSP was held during June 07 – 23, 2006. The Physics VSSP was also conducted during the summer in which students attended the program in batches.
2. Founder's Day : Founder's Day was celebrated on 19th July 2006. Mr. Amrit Abhijat, IAS, District Magistrate, Allahabad was the Chief Guest. Professor R.G. Harshe, Vice-Chancellor, University of Allahabad was the Guest of Honour. Professor Harshe delivered a popular talk on "Globalization in India". A Kavya Gosthi was also arranged on this occasion.

3. Rajbhasha programme was organized on 19th September 2006 for the children of staff members.
4. NBHM : Written test for NBHM scholarships was conducted on 23rd September and the interviews were held on 2nd November 2006.
5. Science Talent Search : Written test for school children (9th to 12th class) was organized on 11th November 2006.
6. Science Talent Search award function was held on 25th January 2007.
7. NBHM : Written test was held on 27th January 2007 for admission to the Institute's Ph.D. programme. Interviews were arranged on 16th and 17th March 2007, for which 10 candidates were selected.
8. JEST (Physics) : Written test was held on 18th February, 2007.

A. RAYCHAUDHURI
DIRECTOR