

International Centre for Theoretical Sciences (ICTS) Program on Non-Equilibrium Statistical Physics (NESP) and Interaction, Instability, Transport and Kinetics: Glassiness and Jamming

30th January – 8th February 2010

Between 30th January and 8th February 2010 two international mega-events were organized at IIT Kanpur. The ICTS program titled '**Non - equilibrium statistical physics (NESP)**', fully sponsored by the newly established International Centre for Theoretical Sciences (ICTS) of TIFR, was held from 30th January to 8th February 2010.

The other parallel conference from 4th to 8th February titled '**Interaction, Instability, Transport and Kinetics: Glassiness and Jamming**' was sponsored jointly by IIT Kanpur and the Centre of Applied Mathematics and Computational Science (CAMCS) of the Saha Institute of Nuclear Physics, Kolkata.

Prof. Debashish Chowdhary (IIT Kanpur) chaired both events, the co-chairs being Prof. Bikas K. Charabarti (SINP, Kolkata) and Prof. Arun K. Grover (TIFR, Mumbai). The conveners were Dr. Amit Dutta and Dr. Satyajit Banerjee from the Department of Physics, IIT Kanpur. The chief patron was Prof. Sanjay G. Dhande, Director, IIT Kanpur and the co-patrons were Prof. R. K. Thareja, Deputy Director, IIT Kanpur; Prof. K. Muralidhar, DORD, IIT Kanpur; Prof. Sanjeev Aggarwal, DRPG, IIT Kanpur; Prof. Manindra Agrawal, Chairman, Golden Jubilee Committee, IIT Kanpur; and Prof. Y.N. Mohapatra, Head, Physics Department, IIT Kanpur. Prof. T. V. Ramakrishnan, FRS (IISc. Bangalore/BHU and ex-Prof. IITK) was the chief advisor of the organizing committee.

The events hosted more than 80 invited speakers and about 60 Ph.D. students in addition to several post-docs and young faculty members from India and abroad. The galaxy of esteemed speakers included a Nobel Laureate, elected members of various prestigious international and national academies, winners of important national and international awards along with past and present presidents of the science academies and several directors of scientific institutes in India and abroad.

Prof. Anthony J. Leggett, a Nobel Laureate in Physics, delivered two lectures. His first lecture was an expanded version of his Nobel Lecture delivered at Stockholm. His second lecture in this conference was announced as an Institute Lecture, which was chaired by Prof. K. Muralidhar (the then Dean R&D, IIT Kanpur) on behalf of the Institute administration.

There were about 110 lectures delivered during the two mega-events. Two abstracts books were brought out by the conference organizers, covering the lectures presented in the NESP IITK: GJ conference. The 1-hr long lectures had a mix of colloquium level talks and overviews of the frontier areas. There were also half-an-hour long presentations which addressed specific issues at the forefront of research in Condensed Matter Physics, Non-equilibrium aspects of Classical Statistical Mechanics, Quantum Phase Transitions, Biological Physics and Computer Science.

The general theme of these events covered two aspects: on the one hand, there were reports of investigations looking at the effects of interactions among the constituents of a macroscopic system and imposition of external driving forces which destabilizes the existing order in a system, while on the other hand, there were reports of studies exploring interactions in driven systems affecting the transport properties and causing slow (glassy) relaxation and jamming. The variety of systems investigated under this general theme included noisy transport of proteins in living cells, Darwinian evolution in eco-systems and emergence of new species, extremely slow processes in soft and glassy materials, earthquakes and stock market, superconductivity and superfluidity under extreme conditions and non-equilibrium effects in new superconductors, magnetic materials, graphene and nanostructured material, to name a few.

The aim was to provide a multidisciplinary forum for the exchange of ideas between theorists and experimentalists on the interplay of interaction, instability, transport and glassy kinetics in a diverse variety of systems encountered in nature. Due to the breadth of the scope of the events, faculty members and students belonging to different departments in IIT Kanpur were able to actively participate in them.

Also, in a brief ceremony one evening, Prof. Jainendra K. Jain (MSc 2 years/Physics /1981) was felicitated with the Distinguished Alumnus award. Dr. Jain is currently the Erwin K. Mueller Professor of Physics at Pennsylvania University, USA. He also delivered an invited lecture at NESP on his pioneering work on the composite Fermion approach to fractional quantum Hall effect.

The closing remarks were made by Prof. Bikas K. Chakrabarti (SINP), Prof. Deepak Dhar (TIFR, Mumbai) and Prof. G. Baskaran (Institute of Mathematical Science, Chennai), who presented a summary of the main findings and the new developments in the field of non-equilibrium statistical physics.