

## **PROGRAM Summary**

### **ICTS Program on NON-EQUILIBRIUM STATISTICAL PHYSICS**

**30 January – 08 February, 2010**

**Venue: Indian Institute of Technology, Kanpur**

**This event is a part of the Golden Jubilee celebration of  
IIT Kanpur : celebrating 50 years of excellence in education and research**

30 JAN (Saturday)	<u>ICTS NESP workshop</u>
Inaug. Session	
9:00-9:30	<b>Director, ICTS &amp; Director, IITK</b>
Session I	<b>Chair: Spenta R. Wadia</b>
9:30-10:30	<b>Udo Seifert</b> , University of Stuttgart, Germany ( <b>NESP2010 Lars Onsager Lecture</b> ): "Stochastic thermodynamics: Theory and experiments".
10:30-11:00	TEA (Special)
Session II	<b>Chair: Udo Seifert</b>
11:00-12:00	<b>Pierre Gaspard</b> , Free University of Brussels, Belgium ( <b>NESP2010 Ilya Prigogine Lecture</b> ): "Microreversibility and time asymmetry in nonequilibrium statistical mechanics and thermodynamics"
12:00-13:00	<b>Gunter M. Schütz</b> , Research Center Jülich, Germany ( <b>NESP2010 Distinguished Colloquium</b> ): "Statistical mechanics of extreme events"
13:00-14:00	LUNCH (Only for registered participants)
Session III	<b>Chair: Pierre Gaspard</b>
14:00-15:00	<b>Jayanta K. Bhattacharjee</b> , SN Bose National Centre for Basic Sciences, Kolkata, India ( <b>NESP2010 J. C. Bose Lecture</b> ): "Centre or limit cycle? RG as a probe"
15:00-16:00	<b>Robin B. Stinchcombe</b> , University of Oxford, UK ( <b>NESP2010 Rudolf Peierls Lecture</b> ): "Universality, and Non-universal Dynamics in Non-equilibrium Systems"
16:00-16:30	TEA
Session IV	<b>Chair: Jayanta K. Bhattacharjee</b>
16:30-17:30	<b>Spenta R. Wadia</b> ( <b>NESP2010 Subrahmanyan Chandrasekhar Lecture</b> ): "The Maldacena duality conjecture and applications"
17:30-18:00	Discussion
Session V	<b>Chair: Amalendu Chandra</b>
18:00-19:00	<b>H. Eugene Stanley</b> , Boston University, USA ( <b>NESP2010 John Kirkwood Lecture</b> ): "Puzzling Physics, Chemistry and Biology of Liquid water".
19:30-21:00	DINNER (Only for registered participants)

31 JAN (Sunday)	<u>ICTS NESP workshop</u>
Session I	<b>Chair: Bulbul Chakraborty</b>
9:00-10:00	<b>David Lacoste</b> , Ecole Supérieure de Physique et de Chimie Industrielles, Paris, France ( <b>NESP2010 Frontier Overview</b> ) "Fluctuation relations for molecular motors",
10:00-10:30	TEA
Session II	<b>Chair: Partha Chakraborty</b>
10:30-11:30	<b>Anatoly B. Kolomeisky</b> , Rice University, Houston, USA ( <b>NESP2010 Frontier Overview</b> ) "Theoretical studies of coupled parallel exclusion processes"
11:30-12:30	<b>Debashish Chowdhury</b> , Indian Institute of Technology, Kanpur, India ( <b>NESP2010 Frontier Overview</b> ) "Modeling traffic with exclusion processes: from molecules to vehicles"
12:30-13:30	LUNCH (Only for registered participants)

Session III (Posters)	Committee of judges for the best poster award: <b>Manoj K. Harbola (Convener), Yogesh M. Joshi, Sudeep Bhattacharjee, Madhav Ranganathan, Tarun Kanti Ghosh</b>
13:30-16:00	<b>POSTERS</b>
16:00-16:30	TEA
Session IV	<b>Chair: Ashutosh Sharma</b>
16:30-17:30	<b>Bulbul Chakraborty</b> , Brandeis University, Waltham, Massachusetts, USA ( <b>NESP2010 Distinguished Colloquium</b> ): "Fluctuations, response, entropy and "temperature" in granular packings"
17:30-18:00	Discussion
Session V	<b>Chair: Arup K. Raychaudhuri</b>
18:00-19:00	<b>H. R. Krishnamurthy</b> , Indian Institute of Science, Bangalore, India ( <b>NESP2010 S. N. Bose Lecture</b> ): "Ultra cold atoms in optical lattices as "emulators" of quantum condensed matter systems"
19:30-21:00	WORKSHOP DINNER (Only for invited guests and registered participants)

01 FEB (Monday)	<u>ICTS NESP workshop</u>
Session I	<b>Chair: Jainendra K. Jain</b>
9:00-10:00	<b>Gianni Blatter</b> , ETH Zürich, Switzerland ( <b>NESP2010 John Bardeen Lecture</b> ): "Cold atoms: Strongly correlated Bosons"
10:00-10:15	<b>Contributed talk: P. Das</b> , (TIFR, Mumbai), C.V. Tomy (IIT-B, Mumbai) G. Balakrishnan (University of Warwick), S. Ramakrishnan (TIFR, Mumbai) and A.K. Grover (TIFR, Mumbai) "Observation of the Fishtail Effect and the magnetic relaxation measurements in Single Crystal of the superconductor FeSe <sub>0.5</sub> Te <sub>0.5</sub> "
10:15-11:00	TEA
Session II	<b>Chair: Gianni Blatter</b>
11:00-12:00	<b>Baruch Rosenstein</b> , National Chiao Tung University, Hsinchu, Taiwan ( <b>NESP2010 Neville Mott Lecture</b> ): „Theory of nonequilibrium current carrying states in type II superconductors with artificial pinning array at matching magnetic field“
12:00-13:00	<b>Simon Bending</b> , University of Bath, UK ( <b>NESP2010 David Schönberg Lecture</b> ): "Vortex Ratchets in highly anisotropic superconductors"
13:00-14:00	LUNCH (Only for registered participants)

Session III	<b>Chair: H. R. Krishnamurthy</b>
14:00-15:00	<b>R. Shankar</b> , Institute of Mathematical Sciences, Chennai, India ( <b>NESP2010 Frontier Overview</b> ) „Majorana Modes and Non-Abelian Anyons in Spin Systems“
15:00-16:00	<b>Leticia F. Cugliandolo</b> , University of Paris, France ( <b>NESP2010 Distinguished Colloquium</b> ) "Cooling rate dependencies in classical coarsening systems: extension of the Kibble-Zurek mechanism"
16:00-16:30	TEA
Session IV	<b>Chair: To be announced</b>
16:30-17:30	<b>Arup K. Raychaudhuri</b> , S.N. Bose National Centre for Basic Sciences, Kolkata, India ( <b>NESP2010 K. S. Krishnan Lecture</b> ) „Do precision physical measurements carry any value? Case study of measurements of thermal fluctuations in molecules of life“
17:30-18:00	Discussion
Session V	<b>Chair: V. Ravishankar</b>
18:00-19:00	<b>Jainendra K. Jain</b> , Pennsylvania State University, USA ( <b>NESP2010 Enrico Fermi Lecture</b> ): "Fractional quantum Hall effect: Why should others care?"
19:30-21:00	DINNER (Only for registered participants)

02 FEB (Tuesday)	<u>ICTS NESP workshop</u>
Session I	<b>Chair: Gunter M. Schütz</b>
9:00-10:00	<b>David Mukamel</b> , Weizmann Institute of Science, Rehovot, Israel ( <b>NESP2010 P. Langevin Lecture</b> ) “Effective long-range interactions in driven non-equilibrium systems”
10:00-10:15	<b>Contributed talk: Sumedha</b> (Harish Chandra Research Institute, Allahabad), Bulbul Chakraborty (Brandeis University, USA) and M. F. Hagan (Brandeis University, USA): “Role of GTP remnants in micro-tubule dynamics”
10:15-11:00	TEA
Session II	<b>Chair: Pradip Sinha</b>
11:00-12:00	<b>Krishanu Ray</b> , Tata Institute of Fundamental Research, Mumbai, India ( <b>NESP2010 Frontier Overview</b> ): “Traffic signals inside a cell: an update on kinesin-dependent intracellular transport and its regulation”
12:00-13:00	<b>Stephan Grill</b> , Max-Planck Institute-PKS & CBG, Dresden, Germany ( <b>NESP2010 Frontier Overview</b> ): “Active Forces and Flows in the Establishment of Cellular Polarity “
13:00-14:00	LUNCH (Only for registered participants)
Session III	<b>Chair: Jonathon Howard</b>
14:00-15:00	<b>Sriram Ramaswamy</b> , Indian Institute of Science Bangalore ( <b>NESP2010 Sivaramakrishna Chandrasekhar Lecture</b> ) “Nonequilibrium soft matter: self-propelled, drifting, and stuck “
15:00-16:00	<b>Vincent Croquette</b> , Ecole Normale Supérieure, Paris, France ( <b>NESP2010 P. G. de Gennes Lecture</b> ): “Brownian motion as a tool to study DNA molecular motors”
16:00-16:30	TEA
Session IV	<b>Chair: Sriram Ramaswamy</b>
16:30-17:30	<b>Jonathon Howard</b> , Max-Planck Institute-CBG, Dresden, Germany ( <b>NESP2010 Max Delbrück Lecture</b> ): “Motor proteins as nanomachines: force, friction and fluctuations”
17:30-18:00	Discussion
Session V	<b>Chair: Debasis Kundu</b>
18:00-19:00.	<b>Joachim Krug</b> , University of Koln, Germany ( <b>NESP2010 Distinguished Colloquium</b> ): “Record theory and applications: Global warming and market fluctuations “
19:30-21:00	DINNER (Only for registered participants)

03 FEB (Wednesday)	<u>ICTS NESP workshop</u>
Session I	<b>Chair: Joachim Krug</b>
9:00-10:00	<b>Reinhard Lipowsky</b> , Max-Planck Institute-KG, Golm, Germany ( <b>NESP2010 Hermann von Helmholtz Lecture</b> ): “Energy conversion and entropy production of molecular machines”
10:00-10:15	<b>Contributed talk: Steffen Liepelt</b> , Max-Planck Institute-KG, Golm, Germany “Kinetic networks of molecular motors “
10:15-10:30	<b>Contributed talk: Sandhya P. Koushika</b> , National Centre for Biological Sciences, Bangalore, India “Regulated distributions of mitochondria in neurons are dependent on motors and microtubules”
10:30-11:00	TEA
Session II	<b>Chair: Reinhard Lipowsky</b>
11:00-12:00	<b>Tom Duke</b> , London Centre for Nanotechnology, University College of London, UK ( <b>NESP2010 A.V. Hill Lecture</b> ) “Mechanosensation by critical oscillators”
12:00-13:00	<b>Paul Matsudaira</b> , National University of Singapore ( <b>NESP2010 D’Arcy Thompson Lecture</b> ): “The design and mechanics of biological macromolecular springs”.
13:00-14:00	LUNCH (Only for registered participants)
Session III	<b>Chair: T.V. Ramakrishnan</b>
14:00-15:00	<b>Anthony J. Leggett</b> , University of Illinois at Urbana-Champaign, USA <b>(Expanded version of NOBEL Lecture 2003)</b> “Superfluid 3-He:the early days as seen by a theorist”
15:00-15:30	TEA
Session IV	<b>Chair: Sanjay Mittal</b>
15:30-16:30	<b>P. B. Sunil Kumar</b> , Indian Institute of Technology, Chennai, India ( <b>NESP2010 Frontier Overview</b> ) “Aster formation and rupture transition in semi-flexible fiber networks with mobile cross-linkers”
16:30-17:30	<b>Frank Jülicher</b> , Max-Planck Institute-PKS, Dresden, Germany ( <b>NESP2010 E.M. Purcell Lecture</b> ): “Steering helical swimmers“
17:30-18:00	TEA
Session V	<b>Chair: Director, TIFR</b>
18:00-19:00	<b>T. V. Ramakrishnan</b> , BHU, Varanasi & IISc, Bangalore ( <b>NESP2010 Homi Bhabha Lecture, organized jointly with TIFR</b> ): “Homi J Bhabha : Growing Science and Doing Science”
19:30-21:00	DINNER (Only for registered participants)

04 FEB (Thursday)	ICTS <i>NESP</i> workshop
(Joint session with IITK:GJ) 9:00-9:30	Inauguration of "IITK:GJ" by Director, IITK
Session I: (Joint session with IITK:GJ):	Chair: <b>T. V. Ramakrishnan</b>
9:30-10:30	<b>Sidney R. Nagel</b> , University Chicago, USA ( <b>NESP2010 Jean Perrin Lecture</b> ) ( <b>Also, IITK:GJ Keynote Address</b> ) "Jamming and the Emergence of Rigidity"
10:30-11:30	TEA (Special)
Session II:	Chair: <b>S. Ramakrishnan</b>
11:30-12:30	<b>Eva Andrei</b> , Rutgers University, USA ( <b>H. Kamerlingh-Onnes Lecture</b> ) "Electronic properties of graphene"
12:30-14:00	LUNCH (Only for registered participants)

Session III:	Chair: <b>Praveen Chaddah</b>
14:00-15:00	<b>Thierry Giamarchi</b> , University of Geneva, Switzerland ( <b>NESP2010 J. H. Van Vleck Lecture</b> ) "Physics in the one dimensional quantum world: the Luttinger liquid paradigm and beyond"
15:00-16:00	<b>Baruch Rosenstein</b> , National Chiao Tung University, Hsinchu, Taiwan ( <b>NESP2010 Frontier Overview</b> ) "Ballistic transport, chiral anomaly and emergence of the electron - hole plasma in graphene"
16:00-16:30	TEA
Session IV:	Chair: <b>David Mukamel</b>
16:30-17:30	<b>Mustansir Barma</b> , Tata Institute of Fundamental Research, Mumbai, India ( <b>NESP2010 M.N. Saha Lecture</b> ): "Entropy-Induced Ordering"
17:30-18:00	Discussion
Session V (Joint session with IITK:GJ)	Chair: <b>Director, IIT Kanpur</b>
18:00-19:00	<b>Anthony J. Leggett</b> , University of Illinois at Urbana-Champaign, USA ( <b>NESP2010 Niels Bohr Lecture</b> ) ( <b>Also IITK:GJ Public Lecture</b> ) "Does the everyday world really obey quantum mechanics?"
19:30-21:30	CONF. DINNER (Only for invited guests and registered participants)

05 FEB (Friday)	<u>ICTS FLNS Conf.</u>
Session I	Chair: <b>Paul Matsudaira</b>
9:00-10:00	<b>Reinhard Lipowsky</b> , Max-Planck Institute-KG, Golm, Germany ( <b>NESP2010 Plenary Lecture</b> ) “Multiscale motility of molecular motors”
10:00-11:00	<b>Gautam I. Menon</b> , Institute of Mathematical Sciences, Chennai India ( <b>NESP2010 Plenary Lecture</b> ) “Stretching Fluctuations and Loop Formation in Short Double-Stranded DNA molecules”
11:00-11:30	TEA
Session II	Chair: <b>G. V. Shivashankar</b>
11:30-12:30	<b>Vincent Croquette</b> , Ecole Normale Superieure, Paris, France ( <b>NESP2010 Plenary Lecture</b> ) “Single molecule study of the T4 replisome”
12:30-13:00	<b>Stefan Klumpp</b> , Max-Planck Institute-KG, Golm, Germany ( <b>NESP2010 Invited Talk</b> ) “Transcription of ribosomal RNA - a central task for rapid (bacterial) cell growth”
13:00-14:00	LUNCH (Only for registered participants)
Session III:	Chair: <b>Gautam I. Menon</b>
14:00-15:00	<b>G. V. Shivashankar</b> , NCBS, Bangalore, India & NUS, Singapore ( <b>NESP2010 Plenary Lecture</b> ) “Spatio-temporal plasticity in genome organization within living cells”.
15:00-15:30	<b>Anatoly B. Kolomeisky</b> , Rice University, Houston, USA ( <b>NESP2010 Invited Talk</b> ) “Spatial fluctuations strongly affect dynamics of motor proteins”
15:30-16:00	<b>P. Ranjith</b> , Indian Institute of Technology, Mumbai, India ( <b>NESP2010 Invited Talk</b> ) “Dynamics of nucleosome assembly and disassembly”
16:00-16:30	TEA
Session IV	Chair: <b>Vincent Croquette</b>
16:30-17:30	<b>P. Matsudaira</b> , National University of Singapore ( <b>NESP2010 Distinguished Colloquium</b> ) “The structure and mechanics of an Actin spring”
17:30-18:00	Discussion
Session V	Chair: <b>Piers Coleman</b>
18:00-19:00	<b>G. Baskaran</b> , Institute of Mathematical Sciences, Chennai, India ( <b>NESP2010 S. Pancharatnam Lecture</b> ) “On the possibility of room temperature superconductivity”
19:30-21:00	DINNER (Only for registered participants)



06 FEB (Saturday)	<u>ICTS FLNS Conf.</u>
Session I	Chair: <b>Ajay K. Sood</b>
9:00-10:00	<b>Rahul Pandit</b> , Indian Institute of Science., Bangalore, India ( <b>NESP2010 Satish Dhawan Lecture</b> ) "Turbulence: A Grand Challenge"
10:00-11:00	<b>Tom Duke</b> , London Centre for Nanotechnology, University College of London, UK ( <b>NESP2010 Plenary Lecture</b> ) " Force generation in the lamellipodium of crawling cells"
11:00-11:30	<b>TEA</b>
Session II	Chair: <b>Kalyanmoy Deb</b>
11:30-12:30	<b>Joachim Krug</b> , University of Köln, Germany ( <b>NESP2010 Ronald Fisher Lecture</b> ) "Evolution of sexual and asexual populations on rugged fitness landscapes"
12:30-13:00	<b>Kavita Jain</b> , Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India ( <b>NESP2010 Invited Talk</b> ) "Quasispecies dynamics on correlated fitness landscapes".
13:00-14:00:	LUNCH (Only for registered participants)

Session III:	Chair: <b>Anatoly B. Kolomeisky</b>
14:00-15:00	<b>Pierre Gaspard</b> , Free University of Brussels, Belgium ( <b>NESP2010 Plenary Lecture</b> ) "Out-of-equilibrium directionality and information processing in biophysical nanosystems"
15:00-15:30	<b>Roop Mallik</b> , Tata Institute of Fundamental Research, Mumbai , India ( <b>NESP2010 Invited Talk</b> ) "Tug-of-war between dissimilar teams of microtubule motors regulates transport and fission of endosomes"
15:30-16:00	<b>Anirban Sain</b> , Indian Institute of Technology, Mumbai, India ( <b>NESP2010 Invited Talk</b> ) "A biological mechanism that utilizes intrinsic curvature of filaments"
16:00-16:30	<b>TEA</b>
Session IV:	Chair: <b>Sidney R. Nagel</b>
16:30-17:30	<b>Ajay K. Sood</b> Indian Institute of Science, Bangalore, India ( <b>NESP2010 C. V. Raman Lecture</b> ) "Order and chaos in flow of Soft Matter"
17:30-20:00	<b>Cultural Program (Jointly with SPIC-MACAY)</b>
20:00-22:00	<b>DINNER</b> (Only for registered participants)

07 FEB (Sunday)	ICTS <i>FLNS</i> Conf.
<b>Session I:</b>	Chair: <b>Sanjay Puri</b>
9:00-10:00	<b>Chandan Dasgupta</b> , Indian Institute of Science, Bangalore, India ( <b>NESP2010 Annesur Rahman Lecture</b> ) “Growing length scales in supercooled liquids”
10:00-11:00	<b>Srikanth Sastry</b> , JNCASR, Bangalore ( <b>NESP2010 Plenary Lecture</b> ) “Slow Relaxation and jamming in simple glass formers”
11:00-11:30	TEA
<b>Session II:</b>	<b>Srikanth Sastry</b>
11:30-12:00	<b>Yogesh M. Joshi</b> , IIT-K, Kanpur ( <b>NESP2010 Invited Talk</b> ) “Time-temperature superposition in soft glassy materials”
12:00-12:30	<b>Prabal K. Maiti</b> , IISc., Bangalore ( <b>NESP2010 Invited Talk</b> ) “Structure and dynamics of water under nano-confinement”.
12:30-13:00	<b>Raja Paul</b> , Indian Association for the Cultivation of Science, Kolkata, India ( <b>NESP2010 Invited Talk</b> ) “In-silico reconstitution of spindle assembly: speed and error of search and capture”
13:00-14:00	LUNCH (Only for registered participants)
<b>Session III:</b>	Chair: <b>Chandan Dasgupta</b>
14:00-15:00	<b>Sanjay Puri</b> , Jawaharlal Nehru University, New Delhi, India ( <b>NESP2010 Plenary Lecture</b> ) “Pattern Formation in Granular Materials „
15:00-16:00	<b>Surajit Sengupta</b> , IACS/SNBNCBS, Kolkata, India ( <b>NESP2010 Plenary Lecture</b> ) “Micro-structure selection in solid-solid transformations: a space-time transition of particle trajectories?”
16:00-16:30	TEA
<b>Session IV:</b>	Chair: <b>G. Baskaran</b>
16:30-17:30	<b>Piers Coleman</b> , Rutgers University, USA ( <b>NESP2010 Lev Landau Lecture</b> ) “Qu-transitions: phase transitions in the quantum era“.
17:30-18:00	Discussion
<b>Session V:</b>	Chair: <b>Bikas K. Chakrabarti</b>
18:00-19:00	<b>Gabriel Aeppli</b> , LCN, University College of London ( <b>NESP2010 Louis Neel Lecture</b> ) “Quantum magnetism and non-Fermi liquids“
19:30-21:00	DINNER (Only for registered participants)

08 FEB (Monday)	<u>ICTS FLNS Conf.</u>
Session I:	Chair: <b>Robin B. Stinchcombe</b>
9:00-10:00	<b>Deepak Dhar</b> , Tata Institute of Fundamental Research, Mumbai, India ( <b>NESP2010 P, C. Mahalanobis Lecture</b> ) “Growing sand piles: a model of proportionate growth”
10:00-11:00	<b>David Mukamel</b> , Weizmann Institute of Science, Rehovot, Israel ( <b>NESP2010 Plenary Lecture</b> ) “Slow dynamics in systems with long-range interactions”
11:00-11:30	<b>TEA</b>
Session II:	Chair: <b>Satya N. Majumdar</b>
11:30-12:30	<b>Abhishek Dhar</b> , Raman Research Institute, Bangalore, India ( <b>NESP2010 Invited Talk</b> ) “Heat conduction and phonon localization in disordered harmonic crystals”
12:30-13:00	<b>Sanjib Sabhapandit</b> , Raman Research Institute, Bangalore, India ( <b>NESP2010 Invited Talk</b> ) “Integer partitions and exclusion statistics”
13:00-14:00	<b>LUNCH</b> (Only for registered participants)

Session III:	Chair: <b>Deepak Dhar</b>
14:00-15:00	<b>Gunter M. Schütz</b> , Research Centre Jülich, Germany ( <b>NESP2010 Plenary Lecture</b> ) “Condensation in temporally correlated zero-range dynamics”
15:00-15:30	<b>Pradeep K. Mohanty</b> , Saha Institute of Nuclear Physics, Kolkata, India ( <b>NESP2010 Invited talk</b> ) “Spatial Correlations in Exclusion Models corresponding to Zero Range Process”
15:30-16:00	<b>TEA</b>
Session IV:	Chair: <b>Manindra Agrawal</b>
16:00-17:00	<b>Satya N. Majumdar</b> , University of Paris, France ( <b>NESP2010 Distinguished Colloquium</b> ) “Understanding search trees via statistical physics”
17:00-17:45	ICTS-NESP2010 Program Summary by <b>Bikas Chakrabarti</b> , <b>Deepak Dhar</b> and <b>G. Baskaran</b>
17:45-18:00	Closing remarks by <b>Amit Dutta</b> and <b>Satyajit Banerjee</b> ,
19:30-21:00	<b>DINNER</b> (Only for registered participants)
<b>09 FEB (Tuesday)</b>	<b>Departure after breakfast</b>