Jayajit Das

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EDUCATION AND PROFESSIONAL EXPERIENCE

Massachusetts Institute of Technology, Cambridge, Massachusetts

- Postdoctoral Fellow with Prof. Arup K. Chakraborty, 2005-present.

Research: Studying the effect of self and non self peptides, and antagonists on T cell signaling using computer simulations synergistically with experiments done in Shaw and Allen Labs, Washington Univ., St. Louis.

University of California, Berkeley, California

- Postdoctoral Fellow with Prof. Arup K. Chakraborty, 2002-2005.

Research: Investigated the effect of receptor clustering and antigen quality on activation and signaling of T lymphocytes using *in silico* modeling synergistic with experiments done in Shaw Lab, Washington Univ., St. Louis.

In collaboration with Prof. J. M. J. Fréchet's group, studied the single molecule conformations of a dendronized polymer chain using Monte Carlo simulations to discover that dendronized polymers are single molecule glasses. Used real space self-consistent field theoretic computer simulations to investigate the self-assembly of dendronized chains to form microphases that may mimic ion channels.

In collaboration with Prof. Nitash Balsara's group, we studied the phase behavior of crosslinked di-block copolymers using Random Phase Approximation and Replica field theory.

Virginia Institute of Polytechnic and State University, Blacksburg, Virginia

- Postdoctoral Fellow with Prof. Uwe C. Täuber, 2000 – 2002.

Research: Investigated the dynamics of flux lines in high temperature superconductors using Monte Carlo simulations to identify the type (point or extended columnar) and the spatial organization (random or ordered) of defects or pins present in the material from voltage noise and voltage-current characteristics.

Raman Research Institute, Bangalore, India and **Institute of Mathematical Sciences**, Chennai (Madras), India

- Ph.D in Physics

Adviser: Prof. Madan Rao. Thesis: *Dynamics of Driven Dissipative Heisenberg Spins with Inertia*

Research: Studied the interplay between dissipative and inertial dynamics and an external drive on a model of an isotropic magnet using Langevin simulations and dynamic renormalization group calculations.

Institute of Mathematical Sciences, Chennai (Madras), India

- M.Sc. in Physics, 1994-1996.

Presidency College, University of Calcutta, Calcutta, India

- B.Sc. in Physics, 1991-1994.

TEACHING AND ADVISING EXPERIENCE

Summer Teaching (Raman Research Institute, Bangalore, India):
1999: Physics 121.

Teaching assistant for graduate course (Raman Research Institute, Bangalore, India):
1997: Physics 418 (Statistical Mechanics)

PUBLICATIONS

S. Cemerski, Jayajit Das, Jason Locasale, Paul M. Allen, Arup K. Chakraborty and Andrey S. Shaw, "Signaling in the Immunological Synapse Depends upon Antigen Quality in a Non-monotonic Manner", *Nature Immunology*, in review.

Enrique D. Gomez, Jayajit Das, Arup K. Chakraborty, John A. Pople and Nitash P. Balsara, "Effect of Crosslinking on the Structure and Thermodynamics of Lamellar Block Copolymers", *Macromolecules*, in review.

Thomas J. Bullard, Jayajit Das, George L. Daquilla, and Uwe C Täuber, "Vortex Washboard Voltage Noise in Type II Superconductors", *Physical Review B*, in review.

Jayajit Das, Madan Rao and Sriram Ramaswamy, "Nonequilibrium Steady States of the Isotropic Classical Magnet", *Physical Review E*, in review.

Jayajit Das, Masaru Yoshida, Zachary Fresco, Tae-Lim Choi, J. M. J. Fréchet and A. K. Chakraborty, "A Dendronized Polymer is a Single Molecule Glass" *Journal of Physical Chemistry B* **109**, 6535 (2005).

Hyeok Hahn, Arup K. Chakraborty, Jayajit Das, John Pople and Nitash P. Balsara "Order-Disorder Transitions in Cross-linked Block Copolymer Solids", *Macromolecules* **38**, 1277(2005).

Thomas J. Bullard, Jayajit Das and Uwe C. Täuber, "Dynamics of Magnetic Flux lines in the Presence of Correlated Disorder" in *Trends in Superconductivity Research*, 67-76, Nova Science Publishers, Inc., NY, 2004.

Jayajit Das, Thomas J. Bullard and Uwe C. Täuber, "Vortex Transport and Voltage Noise in Disordered Superconductors", *Physica A* **318**, 48(2003).

Jayajit Das, Madan Rao and Sriram Ramaswamy, "Nonequilibrium Criticality, Spatio-temporal Chaos and Control", *Europhysics Letters* **60**, 418(2002)

Jayajit Das and Madan Rao, "Ordering Dynamics of Heisenberg Spins with Torque: Crossover, spin waves and defects", *Physical Review E* **62**, 1601(2000).

Jayajit Das and Madan Rao, "Dynamics of Ordering of Isotropic Magnets", *Physica A* **270**, 253(1999).

Jayajit Das and Madan Rao, "Dynamics of Ordering of Heisenberg Spins with Torque -- Nonconserved Case", *Physical Review E* **57**, 5069(1998).

CONFERENCES AND SEMINARS

A dendronized polymer is a single molecule glass

- APS Annual Meeting, Los Angeles, CA, 21-25 March, 2005; AIChE Annual Meeting, Austin, TX, 7-12 November, 2004

Single chain configurations and self-assembly of dendronized polymers

- Stat. Mech. Meeting, Berkeley, CA, 9-11 January, 2004

Phase behavior of crosslinked di-block copolymers

- AIChE Annual Meeting, San Francisco, 16-21 November, 2003; APS March Meeting, Austin, TX, 3-7 March, 2003; Stat. Mech. Meeting, Berkeley, CA, 11-13 January, 2003.

Voltage transport and voltage noise in disordered superconductors

- APS March Meeting, Indianapolis, IN, 18-22 March, 2002; Third Annual Greater Boston Area Statistical Mechanics Meeting, Brandeis University, Boston, MA, 20 October, 2001; Boulder School for Condensed Matter and Materials Physics, University of Colorado, Boulder, CO, 2-28 July, 2001.

Driven magnets, spatio-temporal chaos and chiral steady states

- APS March Meeting, Seattle, WA, 12-16 March, 2001.

Dynamics of ordering in isotropic magnets

- Stat-Phys - Calcutta - III (an international satellite meeting of STATPHYS), S. N. Bose Center of Basic Sciences, Calcutta, India, 4-9 January, 1999; International conference on *Structure and Dynamics of materials in the Mesoscopic Domain* organized by the Royal Society, London and Unilever National Chemical Laboratory, Pune, India, 8-12 December, 1997.

SUMMER SCHOOLS AND WORKSHOPS

- Boulder School for Condensed Matter and Materials Physics on *Nonequilibrium statistical physics, glasses, transport and friction, biological systems and turbulence*, University of Colorado, Boulder, CO, 2-27 July, 2001.

- Abdus Salam International Center for Theoretical Physics Spring College on *Statistical mechanics and dynamics of soft condensed matter*, Trieste, Italy, 2nd May - 6th June, 1998.

REFERENCES

Arup K. Chakraborty

Robert T. Haslam Professor of Chemical Engineering & Professor of Chemistry
Massachusetts Institute of Technology, Cambridge, MA 02139
Phone: (617) 253 3890
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Jean M. J. Fréchet

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Nitash P. Balsara

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