

*Last update: 4/29/10*

**103<sup>rd</sup> Statistical Mechanics Conference**  
**Rutgers University, Busch Campus, Hill Center, room 114**  
**Sunday – Tuesday, May 9-11, 2010**

**CONFERENCE PROGRAM**

**Sunday, May 9**

**8:00-9:00      REGISTRATION & BREAKFAST**

9:00 – 9:25    L. Bunimovich, Georgia Tech.

Which Hole is Leaking the Most: Topological approach to open systems and dynamical networks

9:25 – 9:50    T. Kennedy, University of Arizona

Renormalization group maps for Ising models in lattice gas variables

9:50 – 10:15   C. Newman, Courant Institute

Ground states of the 2D Edwards-Anderson spin glass

**10:15 – 10:45 COFFEE**

10:45 – 11:10 L. Chayes, UCLA

The McKean-Vlasov Equation in Finite Volume

11:10 – 11:35 E. Ben-Naim, Los Alamos

Strong Mobility in Disordered Systems

11:35 – 12:00 J. Machta, University of Massachusetts

Monte Carlo methods for rough free energy landscapes

12:00 – 12:30 P. Chaikin, NYU

Self-Replication Without Life

**12:30 – 1:50    LUNCH**

1:50 – 2:00    Remembering Herman Cummins, Gene Stanley and others

2:00 – 2:25    V. Yakovenko, University of Maryland

Statistical Mechanics of Money, Income, and Wealth

2:25 – 2:50    M. Lipkin, Columbia University/Katama Trading, LLC

Restrictions on short-selling Create bubbles!

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2:50 – 3:15 P. Krapivsky, Boston University  
Kinetics of Cell Division

3:15 – 3:40 B. Chazelle, Princeton University  
The Total S-Energy: an Analytical Tool for Multiagent Dynamics

**3:40 – 4:10 COFFEE**

4:10 – 4:35 J. Gollub, Haverford College  
Statistical Mechanics of Swimming Microorganisms

4:35 – 5:00 H. Levine, University of California, San Diego  
Information Limits on Eukaryotic chemotaxis

5:00 – 5:25 E. Shakhnovich, Harvard University  
Dynamics of evolution and adaptation: insights from ab initio multiscale models

5:25 – 5:55 A. Chakraborty, MIT  
Why people with certain genes can control hiv without therapy: from statistical mechanics to the clinic

6:00 – 8:00 COCKTAILS AND CONCERT WILL BE HELD AT THE FIBER OPTICS  
AUDITORIUM. SPONSORED BY SPRINGER, PUBLISHER OF JOURNAL OF STATISTICAL  
PHYSICS AND COMMUNICATIONS IN MATHEMATICAL PHYSICS. ALL ARE INVITED.

8:00 BANQUET WILL BE HELD AT THE BUSCH CAMPUS FACULTY DINING ROOM.

**ADVANCED RESERVATIONS ARE REQUIRED**

SEE MAP FOR DIRECTIONS: <http://maps.rutgers.edu/maps/default.aspx?preadj=true&campus=4?1326,322>.

## **Monday, May 10**

**8:00 – 8:30 REGISTRATION & COFFEE**

8:30 – 10:00 Short talks, Session A

**10:00 – 10:30 COFFEE**

10:30 – 10:55 V. Rom-Kedar, Weizmann Institute  
Models of the innate immune system: theory and medical implications

10:55 – 11:20 D. Nelson, Harvard University  
Life at Low Reynolds Number

11:20 – 11:50 P. W. Anderson, Princeton University  
What is wrong with QMC?

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11:50 – 12:30 Human Rights session with E. Chudnovsky

**12:30 – 2:00 LUNCH**

2:00 – 2:25 E. Chudnovsky, Lehman College  
Self-organized tunneling dynamics of molecular nanomagnets

2:25 – 2:50 K. Rabe, Rutgers University  
Spin-lattice coupling in magnetic perovskite thin films and superlattices

2:50 – 3:15 N. Berker, Sabanci University  
Anisotropy Effects and Impurity Induced Antiferromagnetism: Renormalization-Group Theory of d=3  
Electronic Models

3:15 – 3:40 E. Andrei, Rutgers University  
Electronic properties of graphene

**3:40 – 4:10 COFFEE**

4:10 – 4:35 R. Ecke, Los Alamos  
Unstable diffusion layers: From thermal convection and material dissolution to sequestration of CO<sub>2</sub>

4:35 – 5:00 M. Alber, University of Notre Dame  
Multiscale Modeling in Biology

5:00 – 5:25 J. Marko, Northwestern University  
Linking topology of large DNA molecules

5:25 – 5:50 C. Callan, Princeton University  
Deep sequencing, mutual information and the thermodynamics of gene regulation

5:50 – 6:15 D. Pine, NYU  
Non-equilibrium phase transitions and random ordering in driven suspensions of rods

**6:15 – 8:15 Cocktails and dinner**

8:15 - A. Libchaber, Rockefeller University  
From geophysics to biology, the effect of temperature and pressure  
gradients

**Tuesday, May 11**

**8:00 – 8:45 REGISTRATION & BREAKFAST**

8:45 – 10:00 Short talks, Session B

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**10:00 – 10:30 COFFEE**

10:30 – 10:55 R. Car, Princeton University  
Quantum protons and hydrogen bonds

10:55 – 11:20 P. Debenedetti, Princeton University  
Thermodynamic and kinetic models of the appearance and amplification of biological chirality

11:20 – 11:45 D. Haldane, Princeton University  
Dissipationless “Hall viscosity” and its relation to incompressibility of quantum Hall fluids

11:45 – 12:10 D. Vanderbilt, Rutgers University  
Orbital magnetoelectric effects and topological insulators

12:10 – 12:35 D. Weitz, Harvard University  
Fast Crystals and Strong Glasses

**12:35 – 1:50 LUNCH**

1:50 – 2:15 R. Kohn, Courant Institute  
Surface relaxation below the roughening temperature: steps, pde's and self-similarity

2:15 – 2:40 J. Sethna, Cornell University  
Bending Crystals: The evolution of self-similar dislocation structures

2:40 – 3:05 F. Family, Emory University  
Physics of Age-Related Macular Degeneration

3:05- 3:30 L. Blum, Rutgers University  
Hyperscaling theory for charged complex systems

3:30 – 3:55 M. Kiessling, Rutgers University  
On the N dependence of classical and quantum N-body ground state energies

3:55 – 4:20 M. Monastyrskiy, Institute for Theoretical and Experimental Physics, Moscow  
Kramers-Wannier duality for non-abelian spin systems

4:20 – Short talks, Session C