

## **Program of the 100th Statistical Mechanics Conference/DIMACS Workshop**

**Rutgers University, Hill Center, Room 114, Saturday–Thursday,  
December 13–18, 2008**

**Joel L. Lebowitz**

Received: 12 January 2009 / Accepted: 11 February 2009 / Published online: 27 February 2009  
© Springer Science+Business Media, LLC 2009

### **Invited Talks**

E. Lieb, Princeton University

A retrospective on rigorous results on the Bose gas

R. Seiringer, Princeton University

The Lieb-Liniger model as a limit of dilute bosons in three dimensions

T. Natterman, University of Cologne, Institute for Theoretical Physics

Localized states and interaction induced delocalization in Bose gases with quenched disorder

M. Batchelor, The Australian National University

Scaling function of the 2D Ising model in a magnetic field

V. Korepin, Stony Brook University

Application of Hartwig formula to quantum spin chains

E. Titi, Weizmann Institute of Science and University of California, Irvine

Recent advances in the three-dimensional Navier-Stokes equations, geophysical and turbulence models

D. Ceperely, University of Illinois at Urbana-Champaign

The 2D quantum one component plasma as seen by path integral Monte Carlo

---

Copies of the presentations of the invited talks as well as information about past meetings, positions wanted and available, can be obtained at: <http://www.math.rutgers.edu/events/smm/>.

The next Statistical Mechanics Conference, the 101st, is scheduled to take place May 10–12, 2009.

---

J.L. Lebowitz (✉)

Center for Mathematical Sciences Research, Rutgers University, 110 Frelinghuysen Road, Piscataway,  
NJ 08854-8019, USA

e-mail: [lebowitz@math.rutgers.edu](mailto:lebowitz@math.rutgers.edu)

H. Spohn, Universitat Munchen  
Kinetics of the Bose-Einstein condensation

J. Fröhlich, ETH Zurich  
Out of equilibrium

E.G.D. Cohen, Rockefeller University  
Nonequilibrium statistical mechanics in its Bronze age

Y. Sinai, Princeton University  
Chaos: yesterday, today and tomorrow

G. Gallavotti, Rome I/Rutgers University  
On the physical significance of finite thermostats

C. Jarzynski, University of Maryland  
Fluctuation theorems, work relations, and the arrow of time

S. Redner, Boston University  
Consensus formation on simple and complex social networks

H. Widom, University of California, Santa Cruz  
Formulas and asymptotics for the asymmetric simple exclusion process

E. Brezin, ENS, Paris  
Non-linear sigma models: A retrospective look

P. Bleher, Indiana University-Purdue University Indianapolis  
Exact solution of the six vertex model with domain wall boundary conditions

M. Aizenman, Princeton University  
A dynamical perspective on the success of Parisi's hierarchical ansatz

S. Smirnov, Universite de Geneve  
10 years of Schramm Loewner evolution

J. Cardy, University of Oxford  
Universality, integrability and analyticity

M.E. Fisher, University of Maryland  
Landau & Zeldovich, 1943; Stillinger & Lovett, 1968: Are electrolytes metallic at criticality?

B. Widom, Cornell University  
Critical points on the surfaces and lines at which phases meet

J. Sengers, University of Maryland  
Critical phenomena in macromolecular solutions

K. Binder, Universitat Mainz  
Surface-directed spinodal decomposition: lattice model versus Ginzburg-Landau theory

H. E. Stanley, Boston University  
Liquid water: new results in bulk, nanoconfined, and biological environments

J. Percus, NYU, Courant Institute  
Classical fluid transport under molecular scale confinement

A. Levine, IAS, Princeton

Evolutionary selection and counter selection in human genes involved in reproduction over the past 30,000 years

B. Shraiman, University of California, Santa Barbara

Alleles versus genotypes: collective behavior of interacting genes in the presence of recombination

B. Bollobas, University of Memphis

Models of real-world networks: inhomogeneous random graphs and convergent graph sequences

R. Zia, Virginia Tech.

Twenty five years after KLS: a celebration of non-equilibrium statistical mechanics

A. Liu, University of Pennsylvania

Jamming: how far have we come, and what still lies ahead?

E. Yuzbashyan, Rutgers University

The link between integrability, level crossings, and exact solution in quantum models

P. Choquard, EPFL, Lausanne

Bound states of mean field equations for a gravitational Bose Einstein condensate gas

J. Yeomans, Oxford University

Hydrodynamic interactions between microswimmers

D. Fisher, University of Stanford

Sex and evolutionary dynamics of microbes

J. Maldacena, IAS, Princeton

Black holes as source of information

P. W. Anderson, Princeton University

The unreasonable effectiveness of experimental physics in mathematics

F. Dyson, IAS, Princeton

Birds and frogs

K. Sreenivasan, The Abdus Salam Inter. Centre for Theo. Physics, Trieste,

Hydrodynamic turbulence

Human Rights Session with talk by A. Beyerchen, Ohio State University

Some thoughts on scientists and the onset of dictatorship

B. Derrida, ENS, France

Current fluctuations in non-equilibrium steady states

M. Mezard, CNRS and Universite Paris-Sud

Message passing strategies in physics and computer science

P. Contucci, Universita di Bologna

Short-range spin glasses: looking back, looking forward

R. Varadhan, NYU Courant Institute

Scaling limits of large systems: past, present and future

- L. Barabasi, University of Notre Dame  
From networks to human mobility patterns
- S. Havlin, Bar-Ilan University  
Novel percolation in networks
- O. Haggstrom, Chalmers University of Technology  
Random walk on a one-dimensional percolation cluster
- R. Kenyon, Brown University  
Dimers and Harnack curves
- Y. Peres, Microsoft Research, Redmond  
Internal DLA and the Abelian sandpile
- J. Beck, Rutgers University  
Randomness of the irrational rotation by square root of two
- G. Grimmett, University of Cambridge  
Using sharp threshold theorems in statistical mechanics
- V. Sidoravicius, CWI-Amsterdam and IMPA-Rio de Janeiro  
Recurrence of Markov chains and DLA type growth
- B. Duplantier, CEA Saclay  
Liouville quantum gravity and KPZ
- J. Steif, Chalmers University of Technology  
Stochastic domination and the Ising model
- A. Sinclair, University of California, Berkeley  
Mixing time for the solid-on-solid model
- D. Randall, Georgia Tech  
Mixing times of local Markov chains on biased lattice configurations
- M. Newman, University of Michigan and Santa Fe Institute  
Random graphs as models of networks
- J. Van den Berg, Netrum Wiskunde and Informatica  
Connections between 2D invasion and critical percolation
- G. Ben Arous, NYU Courant Institute  
Random walks on random trees: trapping, scaling limits, and fluctuation-dissipation
- S. Shlosman, Centre de Physique Theorique, Marseilles  
Gibbs Ensemble of Nonintersecting paths and determinantal processes
- C. Borgs, Microsoft  
Polya urns and convergence of preferential attachment graphs
- D. Galvin, University of Notre Dame  
A threshold phenomenon for independent sets in the hypercube
- G. Sorkin, IBM, Watson Research Center  
The power of choice in a generalized Pólya urn model

**Short Talks**

T. Einstein, University of Maryland

Touching steps on vicinal surfaces: corrections to the fermion picture

A.N. Berker, Koc University

Quenched-vacancy induced spin-glass order

D. Chandler, University of California, Berkeley

Corresponding states of transport behavior of structural glass forming liquids

D.J. Bergman, Tel Aviv University

Critical points of magnetotransport in a composite medium

P. Cvitanovic, Georgia Tech.

Geometry of wall-bounded turbulence

L. Thomas, University of Virginia

Stationary state for a stochastic wave equation modeling heat flow

D. Dong, Hamline University

Refined mean-field approach to TASEP with inhomogeneity

L. Shaw, William and Mary College

Vaccine control for epidemics on adaptive networks

R. Akiyama, Kyushu University

Kirkwood superposition approximation in hard sphere mixture: a study using the OZ-HNC theory

T. Antal, Harvard University

Exciting hard spheres

W. Ellenbroek, University of Pennsylvania

Lateral segregation in a lipid monolayer due to lipid-counterion electrostatics

S. Durukanoglu, Istanbul Technical University

Molecular static calculations of Cu nanowires: the effect of local strain and cross-sectional area

M.L. Manning, Princeton University

Aging in a shear transformation zone model of amorphous solids

O. Ozcelik, Koc University

The Blume-Emery-Griffiths spin glass and inverted tricritical points

C.N. Kaplan, Brandeis University

Infinitely robust order and local order-parameter tulips in Apollonian networks with quenched disorder

G. Tellez, Universidad de los Andes

Statistics of domains and the Wigner surmise

A. Toom, UFPE, Brazil

Substitution operators: rigorous definitions

- W.K. Theumann, Univ. Fed. Rio Grande do Sul, Brazil  
Synchronous dynamics of recurrent neural networks with generalized Hebbian rule
- B. Miller, Texas Christian University  
Synchronization and stability in two neural network topologies
- D. Minh, National Institute of Health  
Free energy surfaces from bidirectional single-molecule force spectroscopy: asymptotic error and application to RNA constructs
- C. Zachary, Princeton University  
Determinantal point processes in high Euclidean dimensions
- M. Bishop, Manhattan College  
The shapes of two dimensional excluded volume continuum star polymer
- P. Whitlock, Brooklyn College/CUNY  
Explorations of hard hyperspherical systems at higher densities
- V. Shneidman, NJIT  
Time-dependent solution of the Becker-Doring equation for a short nucleation pulse
- G. Lee-Dadswell, Cape Breton University  
A momentum conserving one-dimensional system with a finite thermal conductivity
- A. Baule, Rockefeller University  
Singular features of nonequilibrium steady state work fluctuations for Poisson noise
- C. Van Vliet, University of Miami  
Modified convergent (linear) response theory
- M. Kiessling, Rutgers University  
On Ruelle's construction of the thermodynamic limit for the classical microcanonical entropy
- W. Wreszinski, University of Sao Paulo  
A precise version of the third law
- M. Widom, Carnegie Mellon University  
A van der Waals loop in supercooled liquid silicon
- K. Koga, Okayama University  
An infinite-order wetting transition
- A. Theumann, Univ. Fed. do Rio Grande do Sul, Brazil  
Quantum spherical spin-glass with long-range disorder
- M. Shlesinger, Office of Naval Research  
Defect diffusion model of the glass transition
- S. Ji, Rutgers University  
Modeling single-molecule enzyme kinetics based on Planck's radiation formula and the principle of enthalpy-entropy compensation
- M. Kitsak, Boston University  
Leadership in business firm networks

- T. Ohira, University of Tokyo  
Temporal non-locality and stochastic time
- R. Fisch, Princeton University  
Critical behavior of randomly pinned spin-density waves
- S. Ulrich, University of Goettingen  
Cooling and aggregation in wet granulates
- H-C. Kaiser, Weierstrass Institute for Applied Analysis and Stochastics, Berlin  
A thermodynamic approach to transient Kohn-Sham theory
- T. Platini, Virginia Tech (Post-doc. fellow)  
Stationary state of an open hard core bosonic chain
- H. Raz, UC Davis  
Lieb Robinson bounds in the quantum anharmonic lattice
- M. Stenlund, Courant Institute  
Memory loss in time-dependent dynamical systems
- N. Khatiaшvili, Vekua Institute of Applied Mathematics, Tbilisi  
On the 2D quantum billiard problem
- M. Tierz, Brandeis University  
Random matrices in Chern-Simons theory
- L.J. Cook, Virginia Tech.  
Competition for resources in a model for protein synthesis
- N. Araujo, Universidad do Minho, Portugal  
Kinetics of random sequential adsorption on patterned substrates
- Y-L. Chou, Virginia Tech  
Deposition model with temperature dependent diffusion
- M. Filoche, Ecole Polytechnique  
Diffusion reorganized aggregates
- S. Dorosz, Virginia Tech.  
Non reversible dynamics and the detailed fluctuation theorem
- A. Cadilhe, Los Alamos National Laboratory  
Quantifying departure from equilibrium in driven systems
- Y. Dubi, University of California, San Diego  
Fourier's law reconstructed from disorder in electronic quantum wires
- M. Olshani, University of Massachusetts  
Thermalization and its mechanism for generic isolated quantum systems
- R. Batten, Princeton University  
Collective coordinates and classical disordered ground states
- L. Bertini, Univ. La Sapienza  
On the shape of a droplet above a wall
- M. Hinczewski, Technical University of Munich  
End-monomer dynamics of semiflexible polymers

A. Kabakcioglu, Koc University  
Supercoil formation in DNA denaturation

G. Papoian, UNC Chapel Hill  
Molecular noise of capping protein binding induces macroscopic instability in filopodial dynamics

B. Sauerwine, Carnegie Mellon University  
Folding kinetics of riboswitch transcriptional terminators

G. Ramirez-Santiago, Instituto de Fisica, UNAM, Mexico  
Non-linear phenomena in the kinetics of phosphorylation-dephosphorylation reactions in the cell

O. Guzman, UAM-Iztapalapa  
Hydrodynamics and optical textures in liquid-crystal based biosensors

C. Thomas, Syracuse University  
Patchwork dynamics for glassy models

H. Katzgraber, ETH Zurich  
Spin glasses: a one-dimensional view

A. Middleton, Syracuse University  
Patching together dynamics for disordered spin models

T. Prellberg, Queen Mary, University of London  
A self-interacting partially directed walk subject to a force

S. Hill, University of Dallas  
A model for dynamic centrality in scale-free networks

R. Ziff, University of Michigan  
Capture and escape of particles making discrete random walks in a 3d continuum

J. Simmons, Oxford University  
A new SLE result for  $\kappa = 8/3$

A. Kemppainen, University of Helsinki  
Scaling limit for 2D random curves

M. Balazs, Budapest University of Technology and Economics  
 $t^{1/3}$ -order current fluctuations in interacting particle systems

I. Papageorgiou, Imperial College  
The Log-Sobolev inequality for unbounded spin systems on the lattice

A. Nachmias, Microsoft Research  
The Alexander and Orbach conjecture holds in high dimensions

A. Gabrielli, CNR-INFM, Rome  
Two-point correlation properties of stochastic cloud processes

J.C.A. Armas-Perez, UNAM  
Mesophases of the p-q model in 2 dimensions

Y. Liu, University of Illinois at Urbana-Champaign  
Random-field Ising model in and out of equilibrium



P. Hurtado, Universidad de Granada

Confirmation of the additivity principle for current fluctuations in a model of heat conduction

R. Harris, Queen Mary, University of London

Current fluctuations in systems with memory-dependent rates

A. Rakos, Hungarian Academy of Sciences

Logarithmic current fluctuations in non-equilibrium quantum spin chains

T. Reichenbach, Rockefeller University

Mobility and pattern formation of cyclically competing populations

J. Wehr, University of Arizona

Entanglement percolation in quantum networks

P. Kleban, University of Maine

Factorization of cluster density correlations in critical 2-D percolation in rectangles