Program of the 78th Statistical Mechanics Meeting

Department of Mathematics, Rutgers, The State University of New Jersey

14–16 December 1997

Here are the titles presented at the last semiannual Statistical Mechanics Meeting, held in December 1997. As usual these titles are informal and, in many cases, there is only one speaker listed, although the work may have been done by many collaborators. Also, the addresses are incomplete, but e-mail addresses are provided if you are interested in communicating with a speaker.

Information about past and future meetings, as well as positions wanted and available can be obtained via WWW browser at the URL ftp://math.rutgers.edu/pub/smm.

The next Statistical Mechanics Meeting will take place May 16–18, 1998, at Rutgers University.

Joel L. Lebowitz

Review Talks

Recent Developments in Colloids and Interfaces
    R. Lipowsky, MPI Teltow, Germany, lipowsky@mpikg-teltow.mpg.de
Mode Coupling Analysis of the Saffman–Taylor Problem
    M. Widom, Carnegie Mellon University, widom + @andrew.cmu.edu
Fluid Phase Separation in Controlled Pore Glasses
    K. E. Gubbins, Cornell University, keg@cheme.cornell.edu
Hierarchical Structure of Macromolecular Energy Landscapes
    D. Shalloway, Cornell University, dis2@cornell.edu
A Comment on Melting in Two Dimensions
    J. P. Straley, University of Kentucky, PHY134@ukcc.uky.edu

Coexistence of Liquid and Vapor Phases in a Continuum System with
    Finite Range Interactions: Exact Results
        A. Mazel, Rutgers University, mazel@math.rutgers.edu
A New Method for Evaluating the Structure and Thermodynamics of
    Fluids and Magnetic Systems
        G. Stell, SUNY at Stony Brook, GSTELL@sbchm1.chem.sunysb.edu
The Puzzling Statistical Physics of Liquid Water
        H. E. Stanley, Boston University, hes@miranda.bu.edu
Density and Charge Correlations in Ionic Fluids
        M. E. Fisher, University of Maryland
Active Scalars, Dissipative Collapse and the Elusive Singularity
        P. Constantin, University of Chicago, const@cs.uchicago.edu
Probabilistic Approach to the Widom–Kadanoff Scaling Relations
        R. A. Ferrell, University of Maryland, rferrell@muppetn.umd.edu
Hijacking Solid-State Concepts for Liquids
        F. H. Stillinger, Bell Labs, fhs@allwise.lucent.com
A Case of 3 Critical Points for the Widom–Rowlinson Model
        P. Winkler, Bell Laboratories, pw@research.bell-labs.com
The Physics of Branched Growth
        T. Halsey, Exxon Research & Engineering, tchalse@erenj.com
Pattern Formation in Complex Fluids
        M. J. Shelley, New York University, shelley@cims.nyu.edu
Power Laws, Shape-Dependence, and Nonlocality in a Driven, Dissipative
    Steady State
        G. Eyink, University of Arizona, eyink@math.arizona.edu
Nonequilibrium Ensembles, Time Reversal Symmetry and Irreversibility
        G. Gallavotti, University of Rome/Rutgers, giovanni@boltzmann.
        rutgers.edu
Genetic Network Modeling in Light of Large Scale Data Acquisition
        S. Liang, SETI Institute/NASA Ames Research Center sliang@mail.
        arc.nasa.gov
Simple Models of Protein Folding
        C. Tang, NEC Research Institute, tang@research.nj.nec.com
Topological Equilibrium in Circular Polymer Chains and DNA
    Topoisomerases
        A. Vologodskii, NYU/Courant Institute, alex@crab.cims.nyu.edu
Physics and Biology of Supercoiled and Braided DNAs
        J. Marko, University of Illinois at Chicago, marko@isolda.phy.uic.edu
Using Optical Tweezers to Study Biological Motors
        S. M. Block, Princeton University, block@watson.princeton.edu

Round Table: Scaling in Nature and the Nature of Scaling
        J. L. Lebowitz, Chair

L. Kadanoff, University of Chicago, leo@rainbow.uchicago.edu
B. Mandelbrot, IBM, fractal@watson.ibm.com
G. B. West, Los Alamos National Laboratory, gbw@pion.lanl.gov
B. Widom, Cornell University, widom@wisteria.chem.cornell.edu

Passive Scalar Turbulence
B. Shraiman, Bell Labs, boris@physics.bell-labs.com
Anderson Delocalization
J. Miller, California Institute of Technology, miller@haides.caltech.edu
Complex Spectra of Integrable Dynamical Systems. The Bethe Ansatz and
Multifractality
P. Wiegmann, University of Chicago, wiegmann@control.uchicago.edu
Statistical Mechanics of Cold and Warm Unfoldings in Proteins
M. H. Jensen, Nordita, MHJENSEN@nbivms.nbi.dk
Onset and Patterns in Surface-Tension-Driven Convection
J. Swift, University of Texas at Austin, swift@chaos.ph.utexas.ed
Statistical Encoding of Wavelet Transformed Image Data
R. Seiler, Technische Universitaet Berlin/IAS, seiler@math.ias.edu
Graphical Representations and Cluster Algorithms: Some Recent Progress
L. Chayes, UCLA, lchayes@math.ucla.edu
Infinitely Many Sum Rules for Infinitely Many Periodic Orbits
P. Cvitanovic, Northwestern University and Niels Bohr Institute,
Copenhagen, predrag@kompleks.nbi.dk
q-Calculus, Random Sets, and Irreversibility
A. Erzan, Istanbul Technical University, erzan@sariyer.cc.itu.edu.tr
Universal Finite-Size Scaling Functions in Critical Phenomena
C. K. Hu, Academia Sinica, Taiwan, huck@phys.sinica.edu.tw

Short Communications

* indicates speakers

Frustration and Quantum Fluctuations in Heisenberg FCC Antiferro-
magnets
*T. Yildirim, A. B. Harris and E. F. Shender, University of Maryland
and NIST, taner@rrdstrad.nist.gov
Vortex Pinning and the Non-Hermitian Mott Transition
*R. A. Lehrer and D. R. Nelson, Harvard University, lehrer@cmt.
harvard.edu
Extension of the Method of Exact Diagonalization of Quantum Spin
Models to Finite bcc Lattices and Estimation of $T = 0$ Properties of
Heisenberg Model on the Infinite bcc lattice

*D. D. Betts, Dalhousie University, dbetts@ac.dal.ca, G. E. Stewart, University of British Columbia, J. Richter, Magdeburg University and J. Flynn, Dalhousie University

Finite-Temperature Phase Diagram of the $d = 3$ Hubbard Model from Renormalization-Group Theory

*G. Migliorini and N. Berker, MIT, gabriele@cmt4.mit.edu

Large-q Series Expansion for the Ground State Degeneracy of the q-State Potts Antiferromagnet

S. -H. Tsai, SUNY at Stony Brook, tsai@insti.physics.sunysb.edu

Domain Wall Renormalization Group Study of Ising Spin Glass

J. M. Kosterlitz, Brown, and *M. V. Simkin, Rockefeller simkin@calif. rockefeller.edu

Global Random-Field Spin-Glass Phase Diagrams in Two and Three Dimensions

G. Migliorini and *N. Berker, MIT, nihat@cmt5.mit.edu

Mapping Discrete Spins to Interfaces Beyond 2D: Quantum Dimer and 3D Potts Models

C. Henley, Cornell University, clh@msc.cornell.edu

Approximate Phase Diagrams for Driven lattice gases from High Temperature Series Expansions

*B. Schmittmann and R. K. P. Zia, Virginia Tech, beate@galaxie. phys.vt.edu

Vacancy Mediated Interface Roughening in Systems with Ising Type Interactions

*W. Triampo, B. Schmittmann, R. K. P. Zia, Z. Toroczkai, and T. J. Newman, Virginia Tech, wtriampo@roo.phys.vt.edu

Contrasts between Scaling in Interfacial Relaxation and Domain Growth— Violation of a Folk Theorem

*R. K. P. Zia, Virginia Tech, rkpzia@mail.vt.edu, M. Siegert and M. Plischke (Simon Fraser)

Fluctuations at Curved Interfaces

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Dynamical Singularity at An Interface

M. P. Brenner, MIT, brenner@math.mit.edu

Domain-wall picture of asymmetric simple exclusion processes

*A. Kolomeisky, Cornell, abk7@wisteria.chem.cornell.edu, G. M. Schutz, Juelich University, E. Kolomeisky, University of Virginia, and J. P. Straley, University of Kentucky

Striction-Mediated Instability of a Vicinal Surface and a Polaron-Like State of Elementary Step

E. B. Kolomeisky, University of Virginia, ek6n@physics.virginia.edu

Chemically Active Gases Interacting with Gas Radiation (Photons)

J. Polewczak, California State University, hcmth008@email.csun.edu

Euler's Equation for Quasi-Free Quantum Systems

C. Maes and *W. Spitzer, Princeton University, spitzer@phoenix. princeton.edu

Random, Correlated and Coherent Walks on Fractals: Exactly Integrable Nonlinear Diffusion and Wave Equations with Derivatives of Fractional Order

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Statistics of Knots and Correlation Functions in Two Dimensional Field Theory, New Results

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New Results in the Behavior of One Dimensional Gravitating Systems

*B. N. Miller, K. Yawn and P. Youngkins, Texas Christian University bmiller@gamma.is.tcu.edu

Anomalous Behavior of Lyapunov's Exponent in Multi-Bands Random Systems

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Anomalies of Double Well Models

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Fluorescence Technique to Study Sol-Gel Phase Transitions

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Structure of Homogeneous and Inhomogeneous Liquids

*K. Vollmayr, J. D. Weeks and K. Katsov, University of Maryland, vollmayr@ipst.umd.edu

Hydrogen Bond Dynamics in Liquid Water

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Consequences of Spatial Disorder for Contaminant Degradation and Transport in Intrinsic Soil Restoration Schemes

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Phase Behavior and Surface Phase Transitions in the Associated Liquid Mixtures. Lattice MC Simulations

*M. Kotelyanskii, B. Veytsman, and S. K. Kumar, Penn State University, kotelyan@planck.plmsc.psu.edu

The Evolution of Multicomponent Systems at High Pressures: Entropicaly-driven Polymerization

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Multifractality in Human Heartbeat Dynamics

*P. Ch. Ivanov, Boston University, plamen@miranda.bu.edu, L. A. N. Amaral, MIT, L. Goldberger, Harvard, S. Havlin, Bar-Ilan, M. G. Rosenblum, University of Potsdam, Germany, H. E. Stanley, Boston University, and Z. R. Struzik, Amsterdam

Optimal Bayesian OnLine Learning

*S. A. Solla, Northwestern University and The Niels Bohr Institute and O. Winther, The Niels Bohr Institute, solla@snowmass.phys.nwu.edu

From Langevin Equation to Thermodynamics

K. Sekimoto, Kyoto University, sekimoto@yukawa.kyoto-u.ac.jp

Exact Associative Thermodynamics

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Critical Scaling in Binary Mixtures

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Unexpected Behavior Observed in a Critical Liquid Mixture Near a Chemically Modified Wall

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The Scaling of Pressure in Isotropic Turbulence

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Growth Dynamics of the Gross Domestic Product

*Y. Lee, Boston University, youngki@miranda.bu.edu, L. A. N. Amaral, M.I.T., D. Canning, Harvard University, M. Meyer and H. E. Stanley, Boston University

Power-Law Correlations in Stock Market Volatility

P. Cizeau, P. Gopikrishna, Y. Liu, *M. Meyer, G. Stanley, Boston University

Distribution of Base Pair Repeats in Coding and Noncoding DNA Sequences

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Population Dynamics in Chaotic Environments

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Steady State Characteristics of Traffic Flows

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Exact Persistence and Autocorrelation Exponents from Lifshitz–Slyozov–Wagner Theory

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Persistence and Poisoning in Potts Models and Froths

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Nucleation, Growth and Scaling in Slow Combustion

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Onset of Collective Chaotic Dynamics of Turing Patterns in Reaction-Diffusion Systems

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Solitons in the Noisy Burgers Equation

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Dynamical Multiscaling in Quenched Skyrme Systems

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Transport Equation for Scattering by Random Surface Inhomogeneities

A. E. Meyerovich and *A. Stepanyants, University of Rhode Island, armen@phys.uri.edu

The Sliding Phase of DNA-Lipid Complexes

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Entropic Elasticity of Twist-Storing Polymers

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Conformations of Compact Polymers on the Square Lattice

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Statistical Mechanics of Double Stranded Semiflexible Polymers

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Lateral Separation of DNA Using Microlithographic Techniques

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The Walrafen Pentamer and Water Interaction Potentials

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How Defects Can Induce Melting

M. R. Sadr-Lahijany, Boston University, *R. Ray, Institute of Mathematical Sciences, India, and Boston University, ray@imsc.ernet.in, and H. E. Stanley, Boston University

Tilt Modulus of the Flux-Line Liquid in Type-II Superconductors
   M. C. Marchetti and *P. Benetatos, Syracuse University pbenetat@
   mailbox.syr.edu
Duality Spectral Relations between Internal and External Sectors of a
   Qauntum Dot Circle
   A. Gongora-T, R. A. Mendez, G. Baez, University of Mexico and
   *J. Jose, Northeastern University
Critical Behavior of Coupled Cubic Anisotropic Systems with Reduced
Interactions of Fluctuations
   *D. Nicolaides, Bloomfield College, Dnicola@aol.com and A. Lisynasky,
   Queens College
Vortex Loops and Discretized Vortex Loops in 2D Superfluid Helium
   G. A. Goldin, Rutgers, *R. M. Owczarek, and D. H. Sharp, Los
   Alamos National Laboratory, hanna@t13.lanl.gov
Solutions of Hele-Shaw Moving Boundary Problems: Differential
   Geometric and Analytic Continuation Methods
   A. Doliwa, Warsaw University, *H. A. Makaruk and R. M. Owczarek,
   Los Alamos National Laboratory, hanna@t13.lanl.gov
Dynamic Phenomena below Tc in Homogeneous Square-lattice Ising
   Ferromagnets
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$T = 0$ Entropy of Random Magnets
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   msu.edu
Low Density Expansions of Ionic Correlation Lengths
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Free Volume in the Hard-Sphere Liquid
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   detti, S. Torquato, Princeton University, and F. Stillinger, Bell Labs
   and Princeton Materials Institute
Breakdown Phenomena in Random Systems: Graphical Mean-Field Theory
   *R. da Silveira, MIT, rava@mit.edu
On the Stability of the Quenched State in Mean Field Spin Glass Models
   M. Aizenman and *P. Contucci, Princeton University, contucci@
   math.princeton.edu
Finite-Size Scaling for the Widom-Rowlinson Model
   *C. Borgs, Microsoft Research, and I. Erb, University of Leipzig,
   borgs@microsoft.com
Mixed Phases in U(N) Superconductivity

M. A. Moore, University of Manchester, *T. J. Newman, University of Manchester and Virginia Tech, A. J. Bray and S. -K. Chin, University of Manchester, tim@tklee1.phys.vt.edu

Quasi-Long-Range Order in Random-Field and Random-Anisotropy Heisenberg Models in Three Dimensions

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Percolation and Gibbs States Multiplicity for Ashkin-Teller Models in 2 Dimensions

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Inequalities for Critical Points of Disordered Ferromagnets

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Five New Results in Percolation

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Strict Inequality in the Region of Uniqueness for the Edward Anderson Spin-Glass and the Feromagnetic Spin System

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A Note on Random Matrix Ensembles

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Geometrization of Spin Systems

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The Spectrum of Weakly Coupled Map Lattices

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Dynamical Entropy of Systems with Stochastic Noise

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Irreversible Work and Equilibrium Free Energy Differences

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Fractal-Like Transport for a Passive Scalar in a Smooth Flow

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On the Partition Function of the Hofstadter Model

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Switching from Gutenberg Richter to Characteristic Earthquake Distributions in Mean-Field Models of Heterogeneous Faults

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Aging Dynamics in a Simple Free Energy Landscape

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Persistence in Systems with Interactions

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Wealth Distribution in Models of Capital Exchange

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Logarithmic Clustering in Submonolayer Epotaxial Growth

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Quasi-Dendritic Growth Due to Elastic Fields

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Phase Segregation in a Lattice Gas Model with Three-Body Interactions

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Monte Carlo Simulations of Diffusion in a B2-Ordered Alloy Using a Vacancy-Mechanism

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Measurements of the Third Moment in a Turbulent Soap Film

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Quantum Dynamics of Metastable States

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Fronts in Nonlinear Wave Equations with Randomness

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Microscopic Quantum Mechanism for Cholesteric Pitch

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Reversible Aggregation

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Binary Solution Model: Application to Supercooled Water

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Potential Energy Landscape Signatures of Distinct Dynamical Regimes in
Glass Forming Liquids
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Quasi-Dendritic Growth Due to Elastic Fields
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