114th Statistical Mechanics Conference
Rutgers University, Busch Campus, Hill Center, Room 114
Sunday, December 13, 2015 - Tuesday, December 15, 2015
<u>Honorees</u>
David Ruelle and Yakov Sinai

<u>Sunday, December 13, 2015</u>
Registration and Breakfast 8:00 - 9:00

9:00 - 9:25 **Giovanni Gallavotti** - Rutgers University
On the hierarchial model and the Kondo effect

9:25 - 9:50 **Kostya Khanin** - University of Toronto
Renormalization and rigidity for a class of non-linear Interval exchange transformations

9:50 - 10:15 **Eric Carlen** - Rutgers University
Nonequilibrium steady states and approach to them for a simple kinetic model

10:15 - 10:40 **Clement Mouhot** - University of Cambridge
Commuting the mean-field and classical limits in quantum mechanics

Coffee Break 10:40 - 11:10

11:10 - 11:35 **Elliott Lieb** - Princeton University
A Pfaffian formula for monomer-dimer partition functions

11:35 - 12:00 **Roman Kotecky** - University of Warwick
Metastability for interacting particle system on continuum

12:00 - 12:25 **Michael Aizenman** - Princeton University
Topological roots of the fermionic structures seen in the 2D Ising model

Lunch 12:25 - 1:50

1:50 - 2:15 **Victor Yakhot** - Boston University
Small-scale universality in turbulence

2:15 - 2:40 **Jorge Kurchan** - École Normale Supérieure
The dynamics of evolving populations as thermal systems

2:40 - 3:05 **Weinan E** - Princeton University
The Stability of Laminar Shear Flow

3:05 - 3:30 **Valerio Lucarini** - University of Hamburg and University of Reading
Response and Fluctuations in Geophysical Fluid Dynamics

Coffee Break 3:30 - 4:00

4:00 - 4:25 **Dmitry Dolgopyat** - University of Maryland
Local Limit Theorem for Sums of Independent Random Variables

4:25 - 4:50 **Tom Spencer** - Institute for Advanced Study
A strong central limit theorem in 2D statistical mechanics

4:50 - 5:15 **Yuri Kifer** - Hebrew University
A Glimpse at Nonconventional Limit Theorems

| 5:15 - 5:40 | **Michael Vogelius** - Rutgers University |
| | Uniform asymptotics for small inhomogeneities |

5:50 Cocktails & Concert sponsored by Springer at the Fiber Optics auditorium - Everyone is invited
8:00 Dinner at Busch Dining Hall - Reservation required

Monday, December 14, 2015

Registration and Breakfast 7:45 - 8:30
8:30 - 9:55   Short Talks: Session A
Coffee Break 9:55 - 10:25

| 10:25 - 10:50 | **David Vanderbilt** - Rutgers University |
| | How to visualize topological insulators |

| 10:50 - 11:15 | **Gabriel Kotliar** - Rutgers University |
| | Hunds Metals: a New Road to Strongly Correlated Electron Behavior |

| 11:15 - 11:40 | **Yakov (Yasha) Pesin** - Pennsylvania State University |
| | Sinai-Ruelle-Bowen measures for surface diffeomorphisms |

| 11:40 - 12:05 | **Lai-sang Young** - New York University |
| | The many faces of SRB measures |

| 12:05 - 12:30 | **Joel Lebowitz** - Human Rights of Scientists |

Lunch 12:30 - 1:50

| 1:50 - 2:15 | **Anatole Katok** - Pennsylvania State University |
| | Flexibility of entropies and Lyapunov exponents for smooth dynamical systems |

| 2:15 - 2:40 | **Michael Goldstein** - University of Toronto |
| | Quasi-periodic operators and Korteweg-de Vries equations with quasi-periodic initial data. Report on recent progress |

| 2:40 - 3:05 | **Vojkan Jaksic** - McGill University |
| | Adiabatic theorems and Landauer's principle in quantum statistical mechanics |

| 3:05 - 3:30 | **Alex Kontorovich** - Rutgers University |
| | Applications of Ruelle transfer operators |

Coffee Break 3:30 - 4:00

| 4:00 - 4:25 | **Chris Jarzynski** - University of Maryland |
| | Shortcuts to adiabaticity in simple classical systems |

| 4:25 - 4:50 | **Peter Fratzl** - Max Planck Institute of Colloids and Interfaces |
| | A simple model recapitulating aspects of tissue growth controlled by geometric boundary conditions |

| 4:50 - 5:15 | **Giovanni Gallavotti** - Laudatio for David Ruelle |
| 5:15 - 5:40 | **Kostya Khanin** - Laudatio for Yakov Sinai |

5:40 Cocktails with Klezmer music and Dinner at the Hill Center - 7th Floor

Tuesday, December 15, 2015

Registration and Breakfast 7:50 - 8:25

8:25 - 10:00   Short Talks: Session B

Coffee Break 10:00 - 10:30

10:30 - 10:55   **Domokos Szasz** - Budapest university of technology
                       Fourier law from Hamiltonian dynamics

10:55 - 11:20   **Leonid Bunimovich** - Georgia Institute of Technology
                       Transport processes from mechanics

11:20 - 11:45   **Pavel Bleher** - Indiana University-Purdue University Indianapolis
                       Six-vertex model with partial domain wall boundary conditions. Exact solution

11:45 - 12:10   **Lana Jitomirskaya** - University of California, Irvine
                       Very small denominators, sharp arithmetic spectral transitions and sharp description of non-
                       uniformly hyperbolic dynamics

12:10 - 12:35   **Hillel Furstenberg** - Hebrew University of Jerusalem
                       Rational orbits, diophantine approximation and the 3n+1 problem

Lunch 12:35 - 1:50

1:50- 2:15   **Luc Rey-Bellet** - University of Massachusetts
                       Thermodynamic formalism and the numerical analysis of stochastic systems

2:15 - 2:40   **Eugene Speer** - Rutgers University
                       Translation invariant extensions of finite volume measures

2:40 - 3:05   **Aernout Van Enter** - University of Groningen
                       Dynamical versus Diffraction Spectrum in the Description of Long-Range Order

3:05 - 3:30   **Michael Jakobson** - University of Maryland
                       Ergodic properties of some attractors with countable Markov partitions

3:30 - 3:55   **Raghu Varadhan** - New York University
                       Another look at Large Deviations of Brownian local times

4:00   Short Talks: Session C

New directions in statistical mechanics and dynamical systems
December 16 - 17, 2015 at Princeton University, McDonnell Hall A01
<u>A conference dedicated to 80th birthday of D. Ruelle and Y. Sinai</u>

Wednesday, December 16, 2015 (talks in McDonnell A01):

10:00 am: Hillel Furstenberg (Hebrew University of Jerusalem) - Affine Representations and Harmonic Functions

11:10 am: Peter Sarnak (Princeton University and the Institute for Advanced Study) - The Mobius flow,entropy and complexity

2:00 pm: Charles Fefferman (Princeton University) - Formation of singularities in fluid interfaces

3:20 pm: Senya Shlosman (Centre de Physique Théorique) - Spin glass transition as roughening phenomenon

4:20 pm: Hugo Duminil-Copin (Université de Genève) - Pirogov-Sinai type arguments for some planar loop models

Thursday, December 17, 2015 (talks in Taplin Auditorium):

9:30 am: David Ruelle (IHES) - A generalized detailed balance relation (and its relations to mathematics, physics, and biology).

11:00 am: Yakov Sinai (Princeton University) - On Eigenfunctions of Laplacians in two-dimensional domain.