

127th Statistical Mechanics Conference
Rutgers University, Busch Campus, Hill Center, Room 114
Sunday, December 15, 2024 - Tuesday December 17, 2024

Guests of Honor

Albert-Laszlo Barabasi, Leticia F. Cugliandolo and Salvatore Torquato

Sunday, December 15th 2024

Registration and Breakfast 8:00 - 9:00

- 9:00 - 9:25 **Adilson Motter** - Northwestern University
Converse Symmetry Breaking
- 9:25 - 9:50 **Eduardo Fradkin** - University of Illinois
An exactly solvable model of pinned incommensurate charge density waves in two dimensions
- 9:50 - 10:15 **Paul Steinhardt** - Princeton University
The search for quasicrystals: here, there, and everywhere
- 10:15 - 10:45 Coffee Break**
- 10:45 - 11:10 **Thierry Giamarchi** - Université de Genève
One-dimensional disordered bosons, Bose glass and quantum transport
- 11:10 - 11:35 **Natan Andrei** – Rutgers University
Quantum Zeno Effect in Noisy Integrable Quantum Circuits for Impurity Models
- 11:35 - 12:00 **Thomas Truskett** - University of Texas
Illuminating Disorder: Optical Properties of Complex Plasmonic Assemblies
- 12:00 - 12:25 **Subhro Ghosh** - National University of Singapore
Fractal Gaussian Networks: A sparse random graph model based on Gaussian Multiplicative Chaos

Lunch 12:25 - 1:55

- 1:55 - 2:20 **Frank Scheffold** - University of Fribourg, Switzerland
The Impact of Hyperuniformity and Bounded Hole Sizes on Bandgap Formation and Light Localisation
- 2:20 - 2:45 **Andrea Gambassi** - SISSA - International School for Advanced Studies
Casimir-like forces in flocking active matter
- 2:45 - 3:10 **Mehran Kardar** - MIT
Glass of directed polymers
- 3:10 - 3:35 **Marcelo Magnasco** - Rockefeller University
Dynamic control of traveling waves in recurrent neural networks
- 3:35 - 4:05 Coffee Break**
- 4:05 - 4:30 **Paul Chaikin** - NYU
2D Crystallization and Melting far from equilibrium
- 4:30 - 4:55 **István A. Kovács** - Northwestern University
How can we learn from noisy, incomplete or even biased network data?
- 4:55 - 5:20 **Andrea Liu** - University of Pennsylvania
Many more is different

5:30 - 7:20 Cocktails & Concert in the Fiber Optics Auditorium, sponsored by Springer

7:30 Banquet at the Hill Center - 7th Floor - Reservation required

Monday, December 16th 2024

Registration and Breakfast 7:30 - 8:30

- 8:40 - 9:45 **Short Talks: Session A**
- 9:50 - 10:15 **Michelle Girvan** - University of Maryland
Self-organization of excitatory-inhibitory balance facilitates robust performance in reservoir computers

- 10:15 - 10:40 **Gourab Ghoshal** - University of Rochester
Meaning from Matter: Towards a theory of semantic information
- 10:40 - 11:10 Coffee Break**
- 11:10-11:35 **Alessandro Vespignani**
Modeling the Unseen: From Reaction-Diffusion Systems to Pandemic Propagation
- 11:35 - 12:00 **Zoltan Toroczkai** - University of Notre Dame
From networks to mechanisms: degree preserving network growth
- 12:00 - 12:25 **Yang-Yu Liu** - Harvard University
Deep Reinforcement Learning for Combinatorial Optimization

Lunch 12:25 - 1:55

- 1:55 - 2:20 **Roberto Car** - Princeton University
Thermal and quenched disorder in ferroelectrics
- 2:20 - 2:45 **Dashun Wang** - Northwestern University
Understanding the punctuated dynamics of scientific and technological frontiers
- 2:45 - 3:10 **Giuseppe Gonnella** - University of Bari and INFN, sez. di Bari
Dynamics of Active Brownian Particles in two dimensions: macro and microphase separation, cluster diffusion, particle geometry effects.
- 3:10 - 3:35 **Patrick Charbonneau** - Duke University
Jamming the Random Lorentz Gas
- 3:35 - 3:50 **Haina Wang** - University of Pennsylvania
Designer pair statistics of disordered many-particle systems with novel properties

3:50 - 4:20 Coffee Break

- 4:20 - 4:45 Human Rights Session: Ian Jauslin and Joel Lebowitz, Rutgers University
- 4:45 - 5:10 **Alessandro Vespignani** , Laudatio for Albert-Laszlo Barabasi
- 5:10 - 5:35 **Thierry Giamarchi**, Laudatio for Leticia F. Cugliandolo
- 5:35 - 6:00 **Thomas Truskett**, Laudatio for Salvatore Torquato

6:00 Cocktails and Dinner at the Hill Center - 7th Floor, reservation required

Tuesday, December 17th, 2024

Registration and Breakfast 8:00 - 8:30

- 8:30 - 9:45 **Short Talks: Session B**
- 9:45 - 10:10 **Sean P. Cornelius** – Toronto Metropolitan University
Catch-22s of Reservoir Computing
- 10:10 - 10:35 **Baruch Barzel** – Bar Ilan University
Navigating network dynamics
- 10:35 - 11:05 Coffee Break**
- 11:05 - 11:30 **Claudio Chamon** - Boston University
Circuit complexity and functionality: a thermodynamic perspective
- 11:30 - 11:55 **Gustavo Lozano** - Universidad de Buenos Aires, Argentina
Generalised Gibbs ensemble for spherically constrained harmonic models
- 11:55 - 12:20 **Demian Levis** - University of Barcelona
Out-of-equilibrium phenomena in self-driven spin models: synchronisation, flocking and all that

Lunch 12:20 - 1:30

- 1:30 - 1:55 **Giulio Biroli** - Ecole Normale Supérieure

Statistical Physics and Generative AI

- 1:55 - 2:20 **Stephen Miller** - Rutgers University
Sandpile models and the security of post-quantum cryptography
- 2:20 - 2:45 **Avraham Klein** – Ariel University
How viscous bubbles collapse: non-inertial hydrodynamics in curved geometries
- 2:45 - 3:10 **Vieri Mastropietro** - Universita' di Roma La Sapienza
Fine structure constant, anomalous magnetic factor and transport coefficients
- 3:10 - 3:35 **Jorge Kurchan** - Laboratoire de Physique, Ecole Normale Supérieure, Paris
Time reparametrization softness resolves the dilemma of glass dynamics