

**129th Statistical Mechanics Conference
Rutgers University**

**Sunday, Deember 14, Monday, December 15 & Tuesday, December 16, 2025 Busch Campus, Hill Center,
110 Frelinghuysen Road, Room 114, Piscataway, NJ**

Guests of Honor

Christian Maes, James Sethna and Smitha Vishveshwara

Sunday, December 14, 2025: BUSCH Campus, Hill Center, Room 114

Registration and Breakfast 8:00 - 9:25

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| 9:25- 9:50 | Ben Machta - Yale University
<i>Bacterial chemotaxis is limited by sensory information, but sensory information isn't limited by ligand diffusion</i> |
| 9:50 - 10:15 | Shin-ichi Sasa - Kyoto University
<i>Statistical Mechanics of Phase Coexistence in the Discrete Model B under External Driving</i> |
| 10:15-10:40 | Paul Goldbart - Stony Brook University
<i>Random proximity measurements on quantum fluids and the hidden organization they induce</i> |
| 10:40 - 11:10 | <i>Coffee Break</i> |
| 11:10 - 11:35 | Vadim Oganesyan - College of Staten Island
<i>Spatio-temporal order in nonunitary magnets and pumped matter</i> |
| 11:35 - 12:00 | Bruno Nachtergaele - UC Davis
<i>Charge Gap and Neutral Gap Comparison for Fractional Quantum Hall Systems.</i> |
| 12:00 - 12:25 | Matthew P.A. Fisher - UC Santa Barbara
<i>Symmetry Breaking in Quantum and Classical Open System</i> |

Lunch 12:25 - 1:50

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| 1:50 - 2:15 | Naoko Nakagawa - Ibaraki University
<i>Global Thermodynamics for Heat Conduction Systems</i> |
| 2:15 - 2:40 | Michael Vogelius - Rutgers University
<i>Scattering vs. non-scattering</i> |
| 2:40 - 3:05 | Salvatore Torquato - Princeton University
<i>Hyperuniform Classical and Quantum-Mechanical Systems, and Their Novel Physical Properties</i> |
| 3:05 - 3:30 | Kasper Larsen - Rutgers University
<i>Equilibrium models in mathematical finance</i> |
| 3:30 - 4:00 | <i>Coffee Break</i> |
| 4:00 - 4:25 | Stefano Zapperi - University of Milan
<i>Epidemiology of the Great Fear of 1789 in France</i> |
| 4:25 - 4:50 | Sid Redner - Santa Fe Institute
<i>Optimization and Wealth Sharing in First-Passage Resetting</i> |

4:50 - 5:15 **Misha Tsodyks** - Weizmann Institute
Random Tree Model of Meaningful Memory

5:15 - 5:40 **Jason Kim** - Cornell University
Discovering model manifolds of emergent function from high-dimensional data

5:45 - 7:20 Cocktails & Concert in the Fiber Optics Auditorium, Busch Campus sponsored by Springer

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

Monday, December 15, 2025: BUSCH Campus, Hill Center, Room 114

Registration and Breakfast 8:30 - 9:00

9:00 - 10:00 **Short Talks: Session A**

10:00 - 10:30 Coffee Break

10:30-10:55 **David Campbell** - Boston University
Sharing an Ultra-Cold Space with Smitha Vishveshwara

10:55 - 11:20 **Karin Dahmen** - University of Illinois Urbana-Champaign
Universal Crackling Noise and Prediction: from Nanoindentation and the Brain to Earthquakes and Stars?

11:20-11:45 **Roland Bauershmidt** - NYU
Twisted Dirac operators and fractional correlations of the sine-Gordon model at the free fermion point

11:45 - 12:10 **Paul Chaikin** - NYU
Stirred Not Heated: Non-equilibrium melting in 2D

12:10 - 12:25 **Human Rights Session: Ian Jauslin and Joel Lebowitz, Rutgers University**

Lunch 12:25 - 2:00 7th Floor Hill Center

2:00 - 2:25 **David Limmer** - University of California, Berkeley
Large deviations of ionic currents in electrolytes

2:25- 2:50 **Louis- Pierre Arguin** - Baruch
A Statistical Mechanics Approach to Moments of the Riemann zeta function

2:50 - 3:15 **Tzu-Chieh Wei** - Stony Brook University
Local symmetries and extensive ground-state degeneracy of a one-dimensional supersymmetric fermionic chain

3:15 - 3:40 **Nathan Lundblad** - Bates College
Exploring quantum gases on curved manifolds

3:40 - 4:10 Coffee Break

4:10 - 4:35 **Shin-ichi Sasa**, Laudatio for Christian Maes

4:30 - 5:00 **Paul Goldbart**, Laudatio for Smitha Vishveshwara

5:00 - 5:25 **Ben Machta**, Laudatio for James Sethna

5:30 Cocktails and Dinner at the Hill Center - 7th Floor, reservation required

Tuesday, December 16, 2025: BUSCH Campus, Hill Center, Room 114

Registration and Breakfast 8:30 - 9:00

9:00 - 9:30 **Short Talks: Session B**

9:30 - 9:55 **Todd Gingrich**— Northwestern University
Simulating reactions and diffusion: Lessons from toy models

9:55 - 10:20 **Marco Baiesi** — University of Padova
Seeing Dissipation Without Forces: A Kinetic Route to Nonequilibrium Inference

10:20 - 10:45 **Wade DeGottardi** -Texas Tech University
Fluorescence Spectroscopy of Low-Dimensional Quantum Critical Systems

10:45 - 11:15 Coffee Break

11:15 - 11:40 **Jaron Kent-Dobias**- ICTP South American Institute for Fundamental Research
Very persistent random walkers reveal transitions in landscape topology

11:40 - 12:05 **Bryce Gadway** - Penn State University
Quantum magnetism and dynamics in arrays of many-level Rydberg atoms

12:05 - 12:30 **Tami Pereg-Barnea** - McGill University
The bosonic Kitaev chain and topological amplification

Lunch 12:30 - 1:30 7th Floor, Hill Center

1:30 - 1:55 **John Barton** — University of pittsburgh
Inferring predictive models of viral dynamics from genomic surveillance data

1:55 - 2:20 **Helvi Witek** - University of Illinois Urbana-Champaign
Searching for bosonic "condensates" around black holes with gravitational waves

2:20 - 2:45 **Mehran Kardar** - MIT
Spatiotemporal noise stabilizes diversity in strongly-interacting metacommunities

2:45 - 3:10 **Chris Jarzynski** - University of Maryland
Fluctuation theorems for autonomous work