

KAVLI INSTITUTE FOR THEORETICAL PHYSICS
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KITP Conference: Rough Landscapes: From Physics to Algorithms

(Jan 7-11, 2019)

Coordinators: Giulio Biroli, Chiara Cammarota, Patrick Charbonneau, and Andrea Montanari

Monday, Jan 07, 2019

Session Chair: Chiara Cammarota (King's College)

- 8:50am Lars Bildsten (KITP Director) Welcome
- 9:00am Sasha Rakhlin (MIT) TUTORIAL: Generalization and Overfitting --
Basic Concepts and Open Questions
- 10:30am **Morning Break-KITP Courtyard**
- 11:00am Ricardo Zecchina (Polito) On the Existence and on the Role of Wide
Flat Minima in Neural Networks Models
- 11:45am Yan Fyodorov (King's College) On Reconstructing Nonlinearly Encrypted
Signals Corrupted by Noise
- 12:30pm **Lunch Break-KITP COURTYARD**
- 2:00pm **FREE AFTERNOON-SHUTTLE AVAILABLE TO BWSCI**

Tuesday, Jan 08, 2019

Session Chair: Giulio Biroli (ENS)

- 9:00am Marc Mézard (ENS-Paris) TUTORIAL: Disordered systems in Physics,
Information Theory and Computer Science
- 10:30am **Morning Break-KITP COURTYARD**
- 11:00am Michael Jordan (Berkeley) On Gradient-Based Optimization and
Diffusions in High Dimensions
- 11:45am Deanna Needell (UCLA) Iterative Projective Approach for Linear
Systems with Link to Deep Learning
- 12:30pm **Lunch Break-KITP COURTYARD**
- Session Chair: Andrea Montanari (Stanford)**
- 2:00pm Sho Yaida (FAIR) Glassy Slowdown and Amorphous Order

Session Chair: Patrick Charbonneau (Duke)

- 9:00am Leticia Cugliandolo (Sorbonne U) TUTORIAL: Dynamics in High Dimensional Landscapes
- 10:30am **Morning Break-KITP COURTYARD**
- 11:00am Daniel Fisher (Stanford) Evolutionary and Ecological Dynamics: Landscapes and Beyond
- 11:45am Nicolas Brunel (Duke) Dynamics of Neural Networks with Learning Rules Inferred from Data
- 12:30pm **Lunch Break-KITP COURTYARD**

Session Chair: Lenka Zdeborova (CEA)

- 2:00pm Federico Ricci-Tersenghi (La Sapienza) Unexpected Behavior in the off Equilibrium Dynamics of Spin Glasses
- 2:45pm Gerard Benarous (NYU) Denoising Simple Tensors
- 3:30pm **Afternoon Break-KITP COURTYARD**
- 4:00pm David Wales (Cambridge) Energy Landscapes: from Molecules and Nanodevices to Machine Learning
- 4:45pm Amir Dembo (Stanford) TBA
- 5:30pm **RECEPTION-KITP COURTYARD**
- 6:00pm **SPECIAL EVENTS DINNER-KITP COURTYARD**
- 8:00pm **SHUTTLE TO BWSCI**

Friday, Jan 11, 2019**Session Chair: Leticia Cugliandolo (Sorbonne U)**

- 9:00am Ankur Moitra (MIT) TUTORIAL Sum-of-Squares, with a View Towards Average-case Complexity
- 10:30am **Morning Break-KITP COURTYARD**
- 11:00am Adel Javanmard (USC) Analysis of a Two-Layer Neural Network via Displacement Convexity
- 11:45am Roberto Oliveira (IMPA) Local Optima of the Sherrington-Kirkpatrick Hamiltonian
- 12:30pm **Lunch Break-KITP COURTYARD**
- 2:00pm **CONFERENCE END SHUTTLE TO BWSCI *Also available to SB Airport and SB Airbus, Goleta location (See Registration Desk BEFORE FRIDAY to sign up.)**