

KAVLI INSTITUTE FOR THEORETICAL PHYSICS  
www.kitp.ucsb.edu

# KITP Conference: Memory Formation: From Condensed Matter to Biological Matter and Beyond

(Feb 12 - 16, 2018)

Coordinators: Susan Coppersmith, Alan Middleton, Sidney Nagel, and Srikanth Sastry

---

## Monday, Feb 12, 2018

**Session Chair: Karen Daniels (North Carolina State)**

8:50am Lars Bildsten (KITP)	Welcome
9:00am Itai Cohen (Cornell)	Encoding memories in colloidal gels
10:00am	<b>Morning Break</b>
10:30am Robert Behringer (Duke)	Memory in granular materials
11:30am Cynthia Reichhardt (LANL)	Memory effects in clogging and jamming
12:30pm	<b>Lunch Break</b>
2:00pm Giulio Biroli (CEA Saclay)	Emergent phenomena in large interacting communities
3:00pm	<b>Afternoon Break</b>
3:30pm Robin Selinger (Kent State)	Modeling liquid crystal elastomers: from auto-origami to light-driven autonomous soft robotics
4:30pm Ajay Sood (IIS Bangalore)	Direct Experimental Evidence of Encoding and Retrieving of Mechanical Memory in Sheared Amorphous Solids
5:30pm	<b>SHUTTLE TO BWSCI</b>

## Tuesday, Feb 13, 2018

**Session Chair: Joerg Rottler (UBC)**

9:00am Boris Shraiman (KITP)	Active mechanics and strange states of living matter
10:00am	<b>Morning Break</b>
10:30am Clare Yu (UC Irvine)	Remembering Which Way Is Up: Cell Polarization and Proliferation in the Developing Fruit Fly Wing
11:30am Arup Chakraborty (MIT)	Viral populations and immune systems
12:30pm	<b>Lunch Break</b>

**Session Chair: Karin Dahmen (Illinois)**

2:00pm Zorana Zeravcic (ESPCI)	Toward adaptable matter
3:00pm	<b>Afternoon Break</b>
3:30pm Dov Levine (Technion)	Quantifying Hidden Order Out of Equilibrium
	<b>Poster Session</b>
5:30pm	<b>RECEPTION</b>
6:00pm	<b>SPECIAL EVENTS DINNER</b>
8:00pm	<b>SHUTTLE TO BWSCI</b>

**Wednesday, Feb 14, 2018****Session Chair: Jasna Brujic (NYU)**

- 9:00am Itamar Procaccia (Weizmann Inst.) Training, Memory and Universal Scaling in Amorphous Frictional Granular Matter
- 10:00am **Morning Break**
- 10:30am Irmgard Bischofberger (MIT) Interfacial fluid instabilities
- 11:30am Tsvi Tlusty (UNIST) Mechanics and information in a minimal model of protein evolution
- 12:30pm **Lunch Break**
- 2:00pm **FREE AFTERNOON Shuttle Available to BWSCI**

**Thursday, Feb 15, 2018****Session Chair: Leticia Cugliandolo (U Pierre et Marie Curie)**

- 9:00am Partha Mitra (Cold Spring Harbor) Phase Transitions in Machine Learning and Distributed Control
- 10:00am **Morning Break**
- 10:30am James Sethna (Cornell) Deformation of crystals: Connections with statistical physics
- 11:30am Remi Monasson (ENS) Jumping from one continuous memory to another: from theory to hippocampal data analysis
- 12:30pm **Lunch Break**

**Session Chair: Bulbul Chakraborty (Brandeis)**

- 2:00pm Cristina Marchetti (Syracuse) Glassy dynamics in active matter
- 3:00pm **Afternoon Break**
- 3:30pm Lenka Zdeborova (CEA Saclay) Statistical physics of learning a rule: Decades old story continued
- 4:30pm Sidney Nagel (U Chicago) Materials through the lens of memory
- 5:30pm **RECEPTION**
- 6:00pm **SPECIAL EVENTS DINNER**
- 8:00pm **SHUTTLE TO BWSCI**

**Friday, Feb 16, 2018****Session Chair: Alan Middleton (Syracuse)**

- 9:00am L. Mahadevan (Harvard) Geometric memories
- 10:00am **Morning Break**
- 10:30am Shobo Bhattacharya (TIFR) Auto-tuning of friction: A protocol-insensitive (?) route to granular self-organization
- 11:30am Nathan Keim (Cal Poly) Experiments with soft jammed solids: Return-point memory meets self-organization
- 12:30pm **Lunch Break**

**Session Chair: Greg Huber (CZ Biohub)**

2:00pm Arvind Murugan (Chicago)      Associative retrieval of memories in frustrated disordered systems

3:00pm      **Afternoon Break**

3:30pm Srikanth Sastry (JNCASR)      Memory effects in model glasses under cyclic deformation

4:30pm **CONFERENCE END SHUTTLE TO BWSCI \*Also available to SB Airport and SB Airbus, Goleta location. (See Registration Desk BEFORE FRIDAY to sign up.)**