Monday, Oct 20, 2014

Session: Multi-scale modeling of fracture of heterogeneous materials, Chair: Robert Behringer (Duke Univ.)

8:50am Lars Bildsten (KITP Director) Welcome
9:00am Laurent Ponson (CNRS, UPMC) Depinning concepts in failure of heterogeneous materials
9:45am Stephane Santucci (ENS-CNRS) Self-affine structure and avalanche dynamics of crack fronts

Multi-scale modeling of fracture of heterogeneous materials, Chair: Pierre Le Doussal (LPT-ENS)

11:45am Alan Needleman (UNT) Prospects and possibilities for connecting ductile fracture toughness and the statistics of fracture surface roughness

LUNCH

Damage spreading and localization in micro-cracked materials

2:00pm Stefano Zapperi (CNR-IENI) Size effects in the fracture of disordered media
3:30pm Afternoon Break

4:00pm Jérôme Weiss (UJF) Statistical size effects on a strength obtained from an interpretation of failure as a critical transition
4:45pm Vincent Démery (UMASS) An elastic interface approach to failure in microcracked materials
5:45pm SHUTTLE TO BWSCI

Tuesday, Oct 21, 2014

Shear thickening and jamming in granular media, Chair: Pierre Le Doussal (LPT ENS)

9:00am Eric Corwin (Univ. Oregon) Jamming as a renormalizable geometric phase transition
9:45am Eric Brown (Yale) Shear-induced system-spanning structures

10:30am Morning Break

Shear thickening and jamming in granular media, Chair: Robert Behringer (Duke Univ.)

11:00am Matthieu Wyart (NYU) Scaling description of the yielding transition
11:45am Bulbul Chakraborty (Brandeis) Shear-induced rigidity in athermal materials: The search for a unified statistical framework

LUNCH

Avalanches in all their diversity, Chair: Kay Wiese (LPT ENS)

2:00pm Mark Robbins (JHU) Critical scaling of avalanches, stress and spatial correlations in shear of disordered systems
2:45pm Lev Truskinovsky (Ecole Poly.) Criticality in martensites: Plasticity or inertia

3:30pm Afternoon Break

Avalanches in all its diversity, Chair: Kay Wiese (LPT ENS)

4:00pm Gianfranco Durin (INRIM) Spatial avalanches in magnetization dynamics
4:45pm Robert Ecke (LANL) Brittle and non-brittle statistics in a granular-continuum laboratory earthquake experiment

POSTER SESSION

6:45pm SPECIAL EVENTS DINNER

8:30pm SHUTTLE TO BWSCI

Wednesday, Oct 22, 2014

Deformation of amorphous materials

9:00am Itamar Procaccia (Weizmann) Plastic instabilities and shear localization in amorphous solids
9:45am Sri Sastry (JNCASC) Oscillatory shear deformation of amorphous solids: Transition from localized to ergodic behavior and memory effects

10:30am Morning Break

11:00am Ken Kamrin (MIT) Nonlocal continuum modeling of granular flow
11:45am Damien Vandembroucq (ESPCI) Depinning-like models for amorphous plasticity

LUNCH
Special Session in Honor of Jim Langer: Behaviors of Glassy Materials, Chair: Bulbul Chakraborty (Brandeis)

1:30pm Eran Bouchbinder (Weizmann)  Continuum physics of deforming glasses: From oscillatory shear to fracture
2:15pm Michael Falk{falk} (JHU)  Connecting atomistic and continuum descriptions of failure in amorphous solids
3:00pm  Afternoon Break
3:30pm Lisa Manning (Syracuse)  Glassy behavior in biological tissues
4:15pm James Langer (UCSB)  Recent adventures in nonequilibrium statistical thermodynamics
5:00pm  James Langer Reception
7:00pm  SHUTTLE TO BWSCI

Thursday, Oct 23, 2014

Nonlinear mechanics and design, Chair: Mark Shattuck (CCNY)

9:00am Robert Behringer (Duke Univ.)  Breaking granular materials
9:45am Christian Santangelo (Amherst)  Designing mechanical response with geometry
10:30am  Morning Break
11:00am Kirsten Martens (UJF)  Nonlinear response of sheared amorphous systems: Mechanical versus thermal yielding
11:45am Vincenzo Vitelli (Leiden Univ.)  Shear shocks and failure in fragile solids
LUNCH

Acoustic metamaterials, Chair: Corey O'Hern (Yale Univ.)

2:00pm Vitali Nesterenko (UCSD)  Strongly nonlinear discrete metamaterials: Origin of new wave dynamics
2:45pm Xioping Jia (ESPCI - CNRS)  Irreversible sound-matter interaction in granular media
3:30pm  Afternoon Break
4:00pm Karen Daniels (NCSU)  Vibrational modes: Effects of particle shape and loading history
4:45pm Stefan Luding (Univ. Twente)  The effect of disorder on wave propagation: Low-pass filtering in 1D and 3D granular systems
5:45pm  RECEPTION
6:45pm  SPECIAL EVENT DINNER
Avalanche dynamics in disordered systems: Towards a common theoretical framework?, Chair: Jean Carlson (UCSB)

9:00am Jim Sethna (Cornell Univ.) Crackling noise
9:45am Karin Dahmen (UIUC) Universal quake statistics: From nanocrystals to earthquakes

10:30am Morning Break

11:00am Pierre Le Doussal (LPT ENS) Avalanches in disordered elastic systems
11:45am Alan Middleton (Syracuse) Memory and boundary perturbations in disordered spin systems

LUNCH

Earthquake mechanics and friction at heterogeneous interfaces

2:00pm Yan Kagan (UCLA) Validated earthquake prediction: Seismicity modeling, statistical analysis, and forecast testing
2:45pm Paul Johnson (LANL) Laboratory Earthquakes

3:30pm Afternoon Break

4:00pm Yehuda Ben-Zion (USC) Insights on non-universal seismicity patterns from data and models
4:45pm Jörn Davidsen (Univ. Calgary) Earthquake triggering and temporal organization of avalanches during rock fracture

5:45pm SHUTTLE TO BWSCI