

Preliminary program for the 2011 Gordon Research Conference on Adhesion Science:

SUNDAY, July 24, 2011

2:00 pm - 9:00 pm Arrival and Check-in
6:00 pm Dinner

Friction and Wetting Phenomena in Soft Materials

Discussion Leader: **Mark Robbins** (Physics, Johns Hopkins University)

7:30 pm - 7:40 pm Welcome / Introductory Comments by GRC Site Staff

7:40 pm - 8:20 pm **Manoj Chaudhury** (Chemical Engineering, Lehigh University)

Effect of noise on the wetting hysteresis and non-linear friction

8:20 pm - 8:35 pm Discussion

8:35 pm - 9:15 pm **B.N.J. Persson** (Institute für Festkörperforschung, Germany)

Contact mechanics between randomly rough surfaces with application to adhesion, capillary adhesion and seals.

9:15 pm - 9:30 pm Discussion

MONDAY, July 25, 2011

7:30 am - 8:30 am Breakfast

Friction and Wetting Phenomena in Soft Materials

Discussion Leader: **Mark Robbins** (Physics, Johns Hopkins University)

9:00 am - 9:40 am **Antoine Chateauinois** (ESPCI, France)

Friction and adhesion within contact interfaces with rubbers : insights into local dynamics from field measurements.

9:40 am - 10:00am Discussion

10:00am -10:30am Coffee Break

10:30am -11:10am **Ashutosh Sharma** (Chemical Engineering, India Institute of Technology)

Sub-micron ordered structures created by dewetting of ultrathin films

11:10am -11:30am Discussion

11:30am -12:10am **Etienne Barthel** (CNRS/Saint-Gobain, France)

Surface and interface textures -- How ? What for ?

12:10am -12:30am Discussion

12:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 6:00 pm Poster Session

6:00 pm Dinner

Physics and Mechanics of Soft Materials

Discussion Leader: **Zhigang Suo** (Mechanics and Materials, Harvard

University)

7:30 pm - 8:10 pm **J. P. Gong** (Hokkaido University, Japan)

Fracture of tough double network hydrogel

8:10 pm - 8:30 pm Discussion

8:30 pm - 9:10 pm **Tristan Baumberger** (Institut des Nanosciences de Paris, France)

Crack tip velocity control by altering the process zone in physical

hydrogels

9:10 pm - 9:30 pm Discussion

TUESDAY, July 26, 2011

7:30 am - 8:30 am Breakfast

Physics and Mechanics of Soft Materials

University)
 9:00 am - 9:40 am Discussion Leader: **Zhigang Suo** (Mechanics and Materials, Harvard University)
 9:40 am - 10:00am **Michelle Oyen** (Engineering of Life Sciences, Cambridge University)
 10:00am -10:30am *Viscoelastic and Poroelastic Deformation of Gels*
 10:30am -11:10am Discussion
 11:10am -11:30am Coffee Break
 11:30am -12:10am **Costantino Creton** (ESPCI, France)
 12:10am -12:30am *Adhesion of hydrogels under water*
 12:30 pm Discussion
 1:30 pm - 4:00 pm **Wei Hong** (Aerospace Engineering, Iowa State University)
 4:00 pm - 6:00 pm *Mechanics of electronic-ionic-conductor composites*
 6:00 pm Discussion
 Lunch
 Free Time
 Poster Session
 Dinner

Adhesion of Small or flexible devices

University)
 7:30 pm - 8:10 pm Discussion Leader: **Kenneth Shull** (Materials Science, Northwestern University)
 8:10 pm - 8:30 pm **Yonggang Huang** (Mechanical Engineering, Northwestern University)
 8:30 pm - 9:10 pm *Transfer printing for stretchable electronics*
 9:10 pm - 9:30 pm Discussion
David Reedy (Sandia National Laboratory)
Separating material interfaces that have a nano-patterned topography
 Discussion

WEDNESDAY, July 27, 2011

7:30 am - 8:30 am Breakfast

Bio-inspired Adhesion

Discussion Leader: **Metin Sitti** (Mechanical Engineering, Carnegie Mellon Univ.)
 9:00 am - 9:40 am **Walter Federle** (Department of Zoology, Cambridge University)
 9:40 am - 10:00am *Running with sticky feet: biology and mechanics of insect adhesion*
 10:00am -10:30am Discussion
 10:30am -11:10am Coffee Break
Animangsu Ghatak (Chemical Engineering, India Institute of Technology)
Adaptive Adhesion via Sub-surface Network of Fluid Filled microchannels
 11:10am -11:30am Discussion
 11:30am -12:10am **Paul Steen** (Chemical Engineering, Cornell University)
Nature-inspired capillarity-based switchable adhesion
 12:10am -12:30am Discussion
 12:30 pm Lunch
 1:30 pm - 4:00 pm Free Time
 4:00 pm - 6:00 pm Poster Session
 6:00 pm Dinner

Bio-inspired Adhesion

Discussion Leader: **Metin Sitti** (Mechanical Engineering, Carnegie Mellon Univ.)
 7:30 pm - 8:10 pm **Herbert Waite** (Molecular, Cellular and Developmental Biology, UCSB)
The Role of Oxidation-Reduction Chemistry in the Adhesive Performance of Catecholic Biopolymers

8:10 pm - 8:30 pm Discussion
8:30 pm - 9:10 pm **Bruce P. Lee** (Nerites Corporation)
Design and Application of Bioinspired Tissue Adhesive
9:10 pm - 9:30 pm Discussion

THURSDAY, July 28, 2011

7:30 am - 8:30 am Breakfast

Single Molecule and Cell Adhesion
Discussion Leader: **Gang Bao**, (Biomedical Engineering, Georgia Tech.)
Julio M. Fernandez (Biological Sciences, Columbia University)
Protein dynamics under force

9:00 am - 9:40 am
9:40 am - 10:00am Discussion
10:00am -10:30am Coffee Break
10:30am -11:10am **Michael Dustin** (Pathology, New York University),
Immune cell signaling complexes triggered by single molecule recognition

11:10am -11:30am Discussion
11:30am -12:10am **Daniel Hammer** (Bioengineering, University of Pennsylvania)
Coupling molecular mechanics to cell adhesion

12:10am -12:30am Discussion
12:30 pm Lunch
1:30 pm - 4:00 pm Free Time
4:00 pm - 6:00 pm Poster Session
6:00 pm Dinner

Single Molecule and Cell Adhesion
Discussion Leader: **Anand Jagota** (Chemical Engineering, Lehigh University)

7:30 pm - 8:10 pm **Huajian Gao** (Brown University, *Keynote speaker*),
Probing mechanical principles of cell adhesion with a coupled stochastic-elastic modeling framework.

8:10 pm - 8:30 pm Discussion
8:30 pm - 9:10 pm **Samir Ghadiali** (Biomedical Engineering, Ohio State University)
Molecular and Biomechanical Mechanisms of Cancer Cell Adhesion and Migration in the Lung

9:10 pm - 9:30 pm Discussion

FRIDAY, July 29, 2011

7:30 am - 8:30 am Breakfast
9:00 am End of meeting