60th New England Complex Fluids Workshop
Shapiro Campus Center Theater
Brandeis University

September 19, 2014

SCHEDULE

Registration & Coffee: **9:00 - 9:30 AM**
Shapiro Campus Center, Room 236.

2 Talks: **9:30AM - 11:00 AM,** Shapiro Theater
9:30 AM – Eric Brown, Engineering, Yale (30 minutes + 10 discussion)
Dynamic behavior of shear thickening suspensions

10:15 AM – Jorn Dunkel, Math, MIT (30 minutes + 10 discussion)
Hydrodynamics and control of microbial swimming

Coffee: **11:00 AM - 11:30 AM,** Shapiro Center, Room 236

Sound Bites: **11:30 - 12:30 PM,** Shapiro Theater
Four minute updates of current research

Lunch: **12:30 - 1:30 PM,** Shapiro Center, Room 236

2 Talks: **1:30 PM - 3:00 PM,** Shapiro Theater
1:30 PM – Alexandra Zidovska, Physics, NYU (30 min + 10 discussion)
Positional Fluctuations of Interphase Chromatin

2:15 PM – Erkan Tuzel, Physics, WPI (30 min + 10 discussion)
Cooperative intracellular transport by populations of different kinesin motors

Coffee: **3:00 PM - 3:30 PM**, Shapiro Center, Room 236

Sound Bites: 3:30 PM – 5:30 PM, Shapiro Theater
Four minute updates of current research

Registration (free) required: http://complexfluids.org/
Registration deadline: 8am, September 17, 2014

Sponsored by the Brandeis University NSF MRSEC: Bioinspired Soft Materials

Sound Bites Morning Session: 11:30 AM - 12:30 PM

PC: Put your soundbites on **Ning Li**'s laptop
Mac: Put your soundbites on **Nate Tompkins**' laptop

Sound Bites

Gregory Babbitt, Andre Hudson, *Rochester Institute of Technology*
"Quantifying/detecting natural selection the molecular dynamics of the genetic code"

Alexander Barbati; Gareth H. McKinley, *MIT*
"Classical and Confined Rheology of Particle-laden Viscoelastic Systems"

Oni Basu; Linas Mazutis*, Carlos Brambila*, Dave Weitz*, *Broad Institute*
"High-Throughput Drug Screening in-vivo Using Droplet Microfluidics"

Christopher Burke; Badel Mbanga, Zengyi Wei, Marco Caggioni, Patrick Spicer, Timothy Atherton, *Tufts University*
"Packing on ellipsoids: curvature, defects, and symmetry"

Purba Chatterjee; Suhas R. Rao, Patrick T. Underhill
Rensselaer Polytechnic Institute
"Synthesis and characterization of enzyme-catalyzed self-propelling Janus particles""

Fatih Comert; Paul L. Dubin, *Umass Amherst*
"Structure and Dynamics of Protein-Polyelectrolye Coacervates"

Stephen DeCamp; Gabriel Redner, Michael Hagan, Zvonimir Dogic,
Brandeis University
"Defect Dynamics in Microtubule Based Active Nematics"

Xunda Feng; Marissa E. Tousley, Matthew G. Cowan, Brian R. Wiesenauer, Siamak Nejati, Youngwoo Choo, Richard D. Noble, Menachem Elimelech, Douglas L. Gin, Chinedum O. Osuji, *Yale University*
"Scalable Fabrication of Polymer Membranes with Vertically Aligned 1-nm Pores by Magnetic Field Directed Self-Assembly"

Wei He; N. Senbil, B. Davidovitch, A. Dinsmore,
University of Massachusetts Amherst
"Measurement of the Capillary Force on a Particle at a Fluid Interface"

Dustin Jones; Jonathan Celli PhD, William Hanna, Ljubica Petrovic
University of Massachusetts Boston
"Longitudinally monitoring extracellular matrix mechanics during tumor growth and invasion using particle tracking microrheology"

Madison Krieger; Thomas R. Powers, Saverio E. Spagnolie
Brown(MSK, TRP), University of Wisconsin at Madison(SES)
"Steady and transient swimming in a hexatic liquid crystal"

Achini Opathalage, Michael Whittaker, Derk Joester, Seth Fraden
Brandeis University
"Using X-ray transparent microfluidics devices to explore the Amorphous Calcium Carbonate (ACC) phase transition "

Jesse Silverberg; Matt Bierbaum, James Sethna, Itai Cohen,
Physics Department at Cornell University; Wyss Institute at Harvard University
"Revenge of the Mosh Pits (Raw data and early observations)"

Wendong Wang; Andreas Carlson, Alison Grinthal, Tak-Sing Wong, Benjamin Hatton, Sung Hoon Kang, Stephen Kennedy, Joshua Chi, Robert Thomas Blough, L. Mahadevan, Joanna Aizenberg
Harvard University
"Ferrofluid-Infused Porous Surfaces"

Sound Bites Afternoon Session: 3:30 AM - 5:30 PM

PC: Put your soundbites on **Ning Li**'s laptop
Mac: Put your soundbites on **Nate Tompkins**' laptop

Sound Bites

Moumita Dasgupta; Julien Chopin, Arshad Kudrolli
Clark University
"Buckling Dynamics of an elastic filament in a viscous fluid"

Max Eggersdorfer; Esther Amstad
Harvard University
"Parallelization of microfluidic droplet makers"

Yaouen Fily; Aparna Baskaran, Michael Hagan
Brandeis University
"Strongly Confined Active Particles"

Daniel Seeman; Paul L. Dubin
UMass-Amherst
"Protein charge anisotropy and phase separation"

Nesrin Senbil; Benny Davidovitch, Anthony D. Dinsmore
Department of Physics, UMass-Amherst
"Deviatoric curvature of the interface induces quadrupolar deformation around spherical particles"

Samantha McBride; Chris Tilger, Juan Lopez, Amir Hirsa
Rensselaer Polytechnic Institute
"Interfacially Active Fluids in Microgravity: Ring Shear Drop Module"

Harsh Pandey; Patrick T. Underhill
Rensselaer Polytechnic Institute
"Manipulating and separating polymers and particles at the microscale using conformation-dependent electrophoretic mobility"

Jason Perlmutter, Mike Hagan
Brandeis University
"Simulations of Viral Particle Assembly"

David Thomas; Matt Cardarelli, Antoni Sanchez-Ferrer, Badel Mbanga, Timothy Atherton, Peggy Cebe
Tufts University
"Thermotropic Liquid Crystal Elastomers "

Edmund Tang; Patrick T. Underhill, Suhas R. Rao
Rensselaer Polytechnic Institute
"Self-propelling Janus Particles in Viscous and Non-Newtonian Systems"

Gilad Kaufman; Siamak Nejati, Abdu Rachid Thiam, Raphael Sarfati, Michael Loewenberg, Eric Dufresne, Chinedum Osuji
Yale University
"Single-step microfluidic fabrication of soft microcapsules by interfacial polyelectrolyte complexation"

Bevand Keshavarzi; Gareth H. McKinley
MIT, "Fragmentation of Viscoelastic Liquids"

John Maloney; Van Vliet, *MIT*
"Fluidity as a mechanical property of the single suspended cell"

Robert Marsland, *MIT Physics of Living Systems*
"Nonequilibrium Thermodynamics of Colloids"

Shima Parsa; Hubert Sizaret, Eliza Morris, David A. Weitz
Harvard University
"Comparison of 2D and 3D micromodels of porous media"

Matthew Peterson; Georgi Georgiev, Timothy J. Atherton, Peggy Cebe
Tufts University
"Freedericksz Transition of Carbon Nanotube Doped Nematic 5CB"

Steven Vandal; Goker Arpag, Steven R. Vandal, Zhiyuan Shen, Kyle P. Lemoi, Luis Vidali, Erkan Tuzel, *WPI*
"Microtubule-dependent anomalous diffusion of chloroplasts in moss"

Caroline Wagner; Lydia Bourouiba, Gareth McKinley
MIT
Capillary thinning and breakup of saliva threads and rheological aging of mucin solutions

Pattipong Wisanpitayakorn; Pattipong Wisanpitayakorn, Luis Vidali, Erkan Tüzel
WPI
"Measurement of Persistence Length using Curvature Distributions"

Vikrant Yadav; Arshad Kudrolli
Clark University
"Cytoskeletons, Nests, and Beaver Dams: Stress Response of Rod Assemblies"

Alex Plyukhin, *Saint Anselm College*
"Autonomous Brownian motor driven by nonadiabatic variation of internal parameters"

Anupam Sengupta; Francesco Carrara, Roman Stocker
MIT
"Responding to flow: How phytoplankton adapt migration strategies to tackle turbulence"

Setareh Shahsavari; Gareth H. McKinley
MIT
"Numerical analysis of the flow of power-law fluids through nanoporous elements in microfluidics"

Mahsa Siavashpouri; Mark Zakhary, Zvonimir Dogic
Brandeis University
"Self- assembly of DNA origami particles in suspension of depleting polymers":

Siddarth Srinivasan; Robert Cohen; Gareth McKinley
MIT
"Reducing Skin Friction in Turbulent Flows using Sprayable Microstructured Non-Wetting Surfaces"

Dan Beller; Mohamed A. Gharbi, Iris B. Liu
Harvard University, University of Pennsylvania
"Shape-controlled assembly of sharp-edged colloids in nematics"

Camille Girabawe; Seth Fraden, Raphael Cabanas
Brandeis University
"Image-Driven Drop-on-Demand Microfluidics"

Gabe Redner; Aparna Baskaran, Michael F. Hagan
Brandeis University
"Defect Dynamics in a Simulated Extensile Active Nematic":

Walter Schwenger; Edan Chen-Zion, Zvonimir Dogic
Brandeis University
"Chemical Control of Bacterial Flagella Polymorphism"

Mark Zakhary; Thomas Gibaud, Andrew Ward, Zvonimir Dogic
Brandeis University
"Direct Measurement of the Free Energy Landscape of the Colloidal Membrane to Ribbon Transition"

Andrew Balchunas; Rafael Cabanas, Zvonimir Dogic
Brandeis University
"Observing Phase Transitions in Self Assembled Colloidal Liquid Crystal Membranes"

Ning Li; Nathan Tompkins, Hector Gonzalez-Ochoa, Seth Fraden
Brandeis University
"Tunable diffusive lateral inhibition in chemical cells"

Min-Sung (Chris) Hong; Seth Fraden
Brandeis University
"Rapid prototyping of microfluidic chips in COC for facilitating protein crystallization and x-ray crystallography."

Adam Wang; Nathan Tompkins, Seth Fraden
Brandeis University
"Synchronization Control of Coupled Chemical Oscillators with Applications"

Fiodar Hilitski; Andrew Ward, Zvonomir Dogic
Brandeis University
"Measurement of cohesion between microtubule filaments"

Matt Cambria, Nate Tompkins, Seth Fraden
Brandeis University
"Star Graphs of Self-Organizing Chemical Oscillators"

Jacob Gold; Adam Wang, Kyle Harrington, Seth Fraden
Brandeis University
"Towards a Chemical Computer"