10th Statistical Mechanics of Soft Matter Meeting

November 25-27 2024 University of Sydney

We gratefully acknowledge the support of the School of Chemistry, University of Sydney

Programme

Monday Nov. 25th

8:30	Coffee and Welcome	**Learning Hub LG3**
	Chair: Peter Daivis	**Messel Lecture Theatre**
9:00	Andreas Menzel	
	The effects of non-Newtonian rheology on mesoscale, active turbulence	
9:20	Billy Todd	
	Speeding up the transition to steady-state for nanotribology: implications for the application of nonlinear response theory	
9:40	Rishabh More	
	Leveraging elasto-inertial instabilities in curvilinear geometries for efficient liquid cooling applications	
10:10	Minkush Kansal	
	Viscoelastic drop spreading: Cox-Voinov theory with normal stress effects	
10:30	Nathan Clisby	
	The virial expansion for hard discs: recent progress and open questions	
10:50	*Coffee and Tea Break (40 min)*	**Learning Hub LG3**
	Chair: Peter Harrowell	**Messel Lecture Theatre**
11:30	Itai Einav, University of Sydney	
	True equilibrium and metastability of partially saturated soils	
11:50	Charlotte Petersen	
	Modulated liquids: probing the structure of hard spheres	
12:10	Peter Daivis	
	Thermodynamic basis of the phase field theory of solidification	
12:30	Richard Bowles	
	The Role of Defects in the Helical Structures of Quasi-One-Dimensional Confined Hard Spheres.	

12:50 David Huang

Fast and flexible pair potential for anisotropic molecules

1:10 *Lunch (1hr 20min)*

Chair: Debra Bernhardt **Messel Lecture Theatre**

2:30 Gary Bryant

Differential Dynamic Microscopy measurement of motility

2:50 Anna Findlay

Determination of Structural Properties of Glassy Polymers using Static Speckle Scattering

3:10 Nicolas de Souza

Soft matter high-resolution neutron spectroscopy at the Australian Centre for Neutron Scattering

3:30 Mung Suan Pua Duhlian

Phase field simulations of stick-slip flow

3:50 *Coffee and Tea Break (30 min)* **Learning Hub LG3**

Chair: David Huang **Messel Lecture Theatre**

4:20 Erdal Oğuz

Structural Glass Transition of Hyperuniform Liquids

4:40 Liu Songling

Turing pattern and chemical medium-range order of metallic glasses

5:00 Shiyun Zhang

Distinct nature of isostatic and hyperstatic jammed solids in low spatial dimensions

5:20 Finish

6:00 Casual drinks and dinner at Nag's Head Inn, St John's Rd, Glebe

Tuesday Nov. 26th

8:30	Coffee and Tea	**Learning Hub LG3**
	Chair: Gray Bryant	**Messel Lecture Theatre**
9:00	Debra Bernhardt	
	Stochastic and Deterministic Shear Flow	
9:20	Jacek Polewczak	
	H-theorems for dense inert and reactive mixtures with application to global in time existence of solutions	
9:40	Joseph Johnson	
	Exact solutions to the lattice Boltzmann method	
10:10	Stephen Sanderson	
	Local temperature of arbitrary constrained geometry and implications for numerical integration	
10:30	*Coffee and Tea Break (40 min)*	**Learning Hub LG3**
	Chair: Charlotte Petersen	**Messel Lecture Theatre**
11:10	Ravi Jagadeeshan	
	The linear viscoelasticity of dilute and semidilute unentangled wormlike micellar solutions	
11:30	Chris Bradley	
	The escape transition of a lattice star polymer grafted in a pore	
11:50	Amit Varakhedkar	
	Linear Viscoelasticity of Dilute Solutions of Semiflexible Polymers	
12:20	Ellie Hajizadaeh	
	Interpretable Active Learning Meta-modelling for the Association Dynamics of Telechelic Polymers on Colloidal Particles	
12:40	Richard Morris	
	Non Stationary Active Model B: Expanding The Critical Point	
1:00	*Lunch (1hr 30min)*	

Chair: Billy Todd **Messel Lecture Theatre**

2:30 Asaph Widmer-Cooper

The Colloidal Stability of Apolar Nanoparticles in Complex Solvent Environments

2:50 Chuncheng Li

Molecular Simulation Study on the Driving Force of Nanoparticle Self-assembly

3:10 Joe Pollard

Morse Theory and Meron Mediated Interactions Between Disclination Lines in Nematics

3:30 Ahmad Jabbarzadeh

Line tension of surface nanodroplets

3:50 *Coffee and Tea Break (30 min)* **Learning Hub LG3**

Chair: Asaph Widmer-Cooper **Messel Lecture Theatre**

4:20 Bill Van Megen

Existence of the partition function and thermodynamic equilibrium: perspective from hard-sphere colloids

4:40 Sabyasachi Mukherjee

Phase field modelling of cell division

5:00 Zhaochuan Fan

Water-assisted diffusional phase transitions in CsPbI3

5:20 Concluding Discussion

In light of the limited time available for presentation and discussion of each talk, we would like to invite all speakers to upload a copy of their slides onto a computer in the coffee room (Learning Hub LG3) at the beginning of the meeting. These will be available throughout the meeting for participants to view and to facilitate discussion.

Posters	**Learning Hub LG3**	**Available Monday and Tuesday**
Alicia Schuitemaker	*Mechanistic Insights into the Conversion of PbI2 to MAPbI3*	
Sami Al-Izi	*Odd mechanics of active slender structures*	
Fayis Kanheerampockil	tba	
Bappaditya Roy	*Estimation of spatial and time scales of collective behaviours of active matters through learning hydrodynamic equations from particle dynamics*	
Ruiqi Sun	*Equation of state for Lennard Jones chains*	
Nitay Ben-Shachar	*Near-hydrodynamic flow of electrons in high-mobility electronic devices*	

The poster will be electronic and loaded up on monitors in the coffee and tea room (Learning Hub LG3) for the duration of the meeting. If you have a talk prepared then it would be fine to simple load your slides from a USB stick. Participants will be reminded to look at the posters during the morning coffee breaks on Monday and Tuesday.