

# 10<sup>th</sup> 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. 25<sup>th</sup>**

- 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: Ravi Jagadeeshan      **Messel Lecture Theatre**
- 2:30 Gary Bryant  
*Differential Dynamic Microscopy measurement of motility*
- 2:50 Alicia Schuitemaker  
*Mechanistic Insights into the Conversion of PbI<sub>2</sub> to MAPbI<sub>3</sub>*
- 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: Billy Todd      **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. 26<sup>th</sup>**

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

- 12:40      *Lunch (1hr 40min)*
- Chair: David Huang      **Messel Lecture Theatre**
- 2:20      Asaph Widmer-Cooper  
*The Colloidal Stability of Apolar Nanoparticles in Complex Solvent Environments*
- 2:40      Chuncheng Li  
*Molecular Simulation Study on the Driving Force of Nanoparticle Self-assembly*
- 3:00      Joe Pollard  
*Morse Theory and Meron Mediated Interactions Between Disclination Lines in Nematics*
- 3:30      Ahmad Jabbarzadeh  
*Line tension of surface nanodroplets*
- 3:40      *Coffee and Tea Break (40 min)*      **Learning Hub LG3**
- Chair: Asaph Widmer-Cooper      **Messel Lecture Theatre**
- 4:20      Bill Van Meegen  
*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 CsPbI<sub>3</sub>*
- 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**

Debra Bernhardt            *Ion conductivity: Simulations in conjugate ensembles*

Anna Findlay                *Determination of Structural Properties of Glassy Polymers using Static Speckle Scattering*

Fayis Kanheerampockil      *Two-step yielding in jammed microgel suspensions*

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 simply 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.**