

## POLYMER SEMINAR

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DEPARTMENT OF CHEMICAL ENGINEERING

MONASH UNIVERSITY (AUSTRALIA)

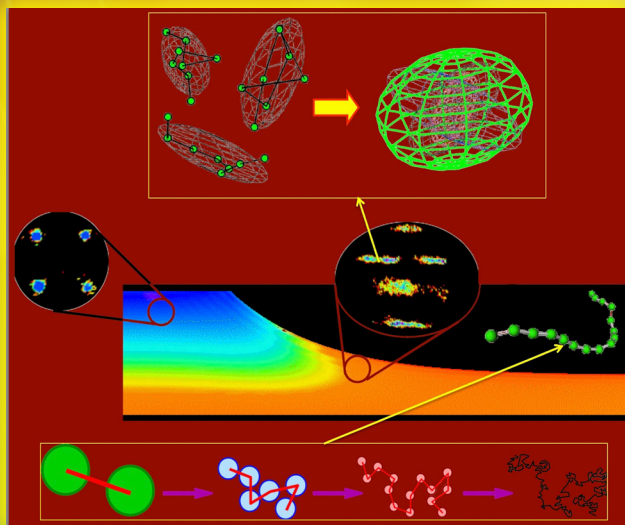


### *“Micro and Macro in the Dynamics of Dilute Polymer Solutions”*

#### Summary

*In spite of significant advances in recent years in our understanding of the dynamics of dilute polymer solutions, there are still large gaps in our knowledge that limit our ability to accurately predict their behaviour in complex flows. The fundamental source of the difficulty is the complex nature of the interaction between polymer molecules (which are spatially extended objects), and solvent molecules (whose length and time*

*scales are significantly shorter). These interactions include thermodynamic interactions, and interactions induced by the presence of flow. In this talk, I will give an overview of the attempts by the molecular rheology group at Monash University to progress our understanding of the fascinating interplay between microscopic phenomena and macroscopic observations in the dynamics of polymer solutions. This will include a discussion of: (i) the microscopic physics necessary to predict the stretching of DNA molecules, the extensional viscosity of polystyrene solutions, and the presence of glassy dynamics, in elongational flows, (ii) the discovery of the existence of a coil-stretch transition as the source of the High Weissenberg Number Problem in macroscopic non-Newtonian fluid mechanics, and (iii) the development of a micro-macro approach for the simulation of viscoelastic coating flows.*



WED. APRIL 16th, 2014 • ROOM 66-110

SEMINAR 3:30 - 5:00 PM • REFRESHMENTS 3:00 PM

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