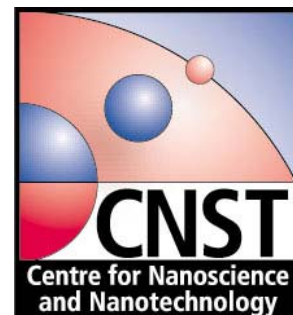


## SEMINAR

### DEPARTMENT OF CHEMICAL & BIOMOLECULAR ENGINEERING CENTRE FOR NANOSCIENCE AND NANOTECHNOLOGY



- TOPIC:** Processing Colloidal Particles to Behave Like Molecules
- SPEAKER:** Dr Dayang Wang  
Max Planck Institute of Colloids and Interfaces, Potsdam, Germany
- TIME:** 12:00-1:00pm, Thursday, 23 April 2009 (no RSVP required)
- VENUE:** Theatre A1 (room 1.07), Old Engineering block  
The University of Melbourne

#### ABSTRACT:

Over recent years, our major research efforts have been focused on surface modification of colloidal particles by functional molecular and macromolecular ligands in order to mimic the self-organisation behaviour of molecules to achieve tailor-made direct assembly and organisation of colloidal particles. I will first highlight our recent results in the use of appropriate hydrophobic capping to impart colloidal nanoparticles with the interfacial behaviour mimicking amphiphilic molecules. Distinct from microparticles, nanoparticles show stimuli-responsive interfacial behaviour. The potential technical use of such interfacial active colloidal nanoparticles is also covered.

I will present our recent successes in using stimuli-responsive polymer ligands that are anchored on colloidal particles in order to switch the surface wettability on the particles between hydrophobic and hydrophilic in response to environmental stimuli. This permits the reversible transfer of the particles between aqueous and organic phases across an interface, and thereby simulate the interfacial transfer of molecules across biological barriers.

I will also demonstrate the significant influence of electrostatic repulsion on self-assembly of aqueous colloidal particles, and emphasise that electrostatic repulsion, albeit isotropic, can act in an anisotropic way; this allows the organisation of colloidal particles in a similar manner to condensation polymerisation. I will next present our achievements in surface patterning via colloidal lithography, and especially highlight the results on patterning the surfaces of colloidal particles and thus give the particles nanoscale “valance”. The future challenges associated with using colloidal particles to mimic molecular behaviour will also be given.