

Nanoscale & Microscale Engineering

82nd ACS Colloid and Surface Science Symposium

North Carolina State University (Raleigh, NC)

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<http://www.colloids2008.org/>

Summary

Research in colloidal science has long included studies in synthesis, stability, interparticle forces, rheology, and other fundamental topics of importance. However, we are now moving into an exciting era where these principles are being skillfully applied to design and fabricate functional machines and devices at the nano/microscale. This symposium aims to demonstrate the linkages between functional structures and devices, design and fabrication, nano/microscale building blocks, and fundamental aspects. Invited keynote speakers highlight the focus areas for each of four sessions:

- 1 Functional structures and devices (keynote: Frank Caruso**, Department of Chemical and Biomolecular Engineering, The University of Melbourne). E Ink, valves and pumps, energy collection or storage, environmental remediation, electronics, metamaterials or cloaking, direct “printing” of structures, sensors, SERS, robotics, active movement or functional changes, fuel cells, photovoltaics.
- 2 Design and fabrication at the nano/microscale (keynote: Vinothan Manoharan**, Departments of Physics and Chemical Engineering, Harvard University). Templating techniques (natural and synthetic templates, incommensurate structures), lithography, simulations of assembly processes, interfacing micro- and macroscale devices, shear-induced assembly, laser polymerization “assembly”, electrorheological (ER) or magnetorheological (MR) fluid directed assembly, controlled drying and dip coating.
- 3 Nano/microscale building blocks (keynote: Younan Xia**, Department of Biomedical Engineering, Washington University). Particle materials (oxides, polymers, metals, semiconductors/quantum dots, biological, fluid droplets, gels), anisometric shapes, sizes (1 nm to 10 μm ; bi-, tri- and monodisperse), functional coatings, patchy particles.
- 4 Fundamental science underlying nano/microscale engineering (keynote: Mike Bevan**, Department of Chemical Engineering, Texas A&M University). Photonic bandgap calculations, flow patterns in microfluidic devices, interparticle forces, colloidal stability and deposition, colloidal phase behavior, characterization techniques (AFM, NSOM, etc.), physics due to nanoscale phenomena, particle transport.

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