



University of Connecticut

Chemical, Materials & Biomolecular Engineering Department

Invites you to a seminar by:

Kathleen J. Stebe

**Richer and Elizabeth Goodwin Professor of Engineering and Applied Science
Chemical and Biomolecular Engineering Department
University of Pennsylvania**

Directed Assembly of Complex Particles

Particles with well defined shapes can be directed to assemble spontaneously into complex structures at fluid interfaces. Here we explore two themes using experiment with supporting analysis and simulation. First, we explore the migration and assembly of microparticles by capillarity. Particles with well-defined shapes on otherwise planar interfaces are shown to form microstructures with preferred orientations and mechanical responses that depend subtly on particle shape. On curved interfaces, particles interact via capillarity with the interface curvature field. The resulting capillary energy forces particle migration along curvature gradients and drives particle alignment along principal axes. Curvature driven migration is explored as a means to direct particles to docking sites, and to mold particle structures. Second, we explore the migration of particles at interfaces of liquid crystals driven by elastic energy of the liquid crystalline subphase with well defined defect structures.

FRIDAY, SEPTEMBER 14, 2012

**INSTITUTE OF MATERIAL SCIENCE BUILDING, Room 20
11:00 a.m.**

Refreshments will be served at 10:45 a.m.

Bio



Kathleen J. Stebe received a B.A. in Economics from the City College of New York, and a Ph.D. in Chemical Engineering at the Levich Institute, also at CCNY, under the guidance of Charles Maldarelli. Thereafter, she spent a post-doctoral year in Compiègne, France working with Dominique Barthes Biesel. Professor Stebe joined the Department of Chemical Engineering at Johns Hopkins University, where she rose through the ranks to become a tenured Professor and to serve as the department chair. In 2008, Professor Stebe joined the faculty at the University of Pennsylvania as the Richer and Elizabeth M. Goodwin Professor of Engineering and Applied Science. From 2008-2012, Professor Stebe served as the department chair of Chemical and Biomolecular Engineering. In July 2012, she assumed the post of Deputy Dean for Research in the School of Engineering and Applied Science. Professor Stebe has been a Fellow at the Radcliffe Institute for Advanced Studies; she has received the Robert S. Pond Excellence in Teaching Award at JHU, the Frenkiel Award from the Division of Fluid Dynamics of the American Physical Society, and was recently named a Fellow of the APS. Professor Stebe's research focuses on capillary phenomena, including how anisotropic particles interact and assemble at interfaces and in complex fluids, and how surfactants can be used to influence interfacial flows. Other aspects of her research address particle assembly and tailored interfaces for biological and materials applications.