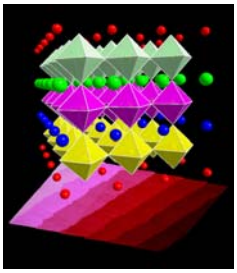
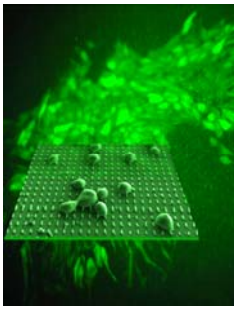
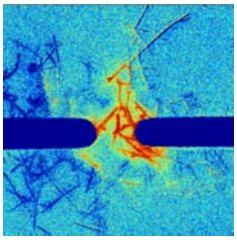
CNMS DISCOVERY SEMINAR SERIES







Friday, February 29, 2008
11:00 am
Iran Thomas Auditorium, 8600
Light refreshments will be served

"Block copolymer self-assembly for functional nanostructures in ionic liquids"

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Abstract:
Ionic liquids are currently receiving a great deal of attention, due to their many appealing physical and chemical attributes. These include extremely low vapor pressures, wide temperature and electrochemical windows, high ionic conductivities, and tunable solvation properties. However, in many potential applications it will be necessary to provide mechanical integrity and/or nanostructural organization to the ionic liquid-containing material, without compromising the desired properties. We will illustrate this idea with several specific examples. Self-assembly of ABA and ABCBA copolymers in ionic liquids is a promising route to so-called ion gels. Several different systems will be described, including thermoreversible gels. The successful application of ion gels as gate dielectric materials in polymer thin film transistors will also be discussed. In other applications of ionic liquids, such as media for chemical transformations, it will be useful to have surfactant systems for the transport, separation, sequestration, or extraction of selected components. We have developed several diblock copolymer systems that form spherical, cylindrical, and vesicular micelles in hydrophobic ionic liquids. Furthermore, we have shown a remarkable "micelle shuttle" effect, whereby intact micelles can be transferred back and forth between water and an immiscible ionic liquid, just by variation in temperature.

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