

DEPARTMENT OF

ENGINEERING MECHANICS

COLLEGE OF ENGINEERING

Fall 2010 Seminar Series

Studying polymers with fields

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Polymers are large molecules made up of many small chemical units (monomers) joined together by chemical bonds. Properties of polymers depend not only on the properties of monomers, but also on how monomers are connected (chain architecture) and how many monomers are connected (chain length). The unique properties of polymers make them indispensable in our everyday life. Predicting their structure-property relations is therefore of paramount importance, particularly for inhomogeneous systems such as polymers at surfaces and interfaces.

Since proposed about 40 years ago, the polymer self-consistent field (SCF) theory has been used to study the equilibrium structures of a wide variety of inhomogeneous polymeric systems with great success. In this talk, I will present our recent work using SCF calculations on the nanostructures formed in three model polymeric systems: (1) the self-assembly of block copolymers under nano-confinement, which has great potential applications in nanotechnology; (2) the stimuli-response of two-component polymer brushes, which can be used to create “smart” surfaces; and (3) the layer-by-layer assembly of polyelectrolytes (charged polymers), which has diverse applications in many fields including biomaterials. Our results are in good agreement with experimental findings.

Tuesday, September 28, 2010

3:30 PM

W183 Nebraska Hall

There will be a reception in W317.7 NH at 3:00 PM, preceding the seminar.
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