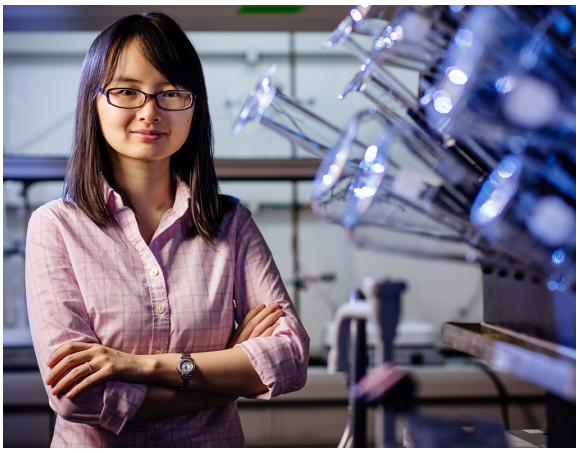
DEPARTMENT OF
Chemical and
Biological Engineering
UNIVERSITY OF WISCONSIN–MADISON

2016 Fall CBE Seminar Series

presents:



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Surprises in Self-assembly Dynamics at the Nanoscale

Self-assembly of nanoscale building blocks is an efficient strategy to construct complexity in biology and engineering, which produces extremely rich phases, reconfigurability and associated functions. Yet the quantitative prediction of their ensemble architectures and formation kinetics remains a challenge due to technical impediments. Here we use a new nanoscopic imaging technique, liquid phase transmission electron microscopy, to directly image the self-assembly of colloidal nanoparticles in solution, one-by-one in real-time. Depending on solvent conditions, a single type of anisotropic, triangular nanoprisms can lead to a wide variety of final structures not previously predicted: linear and cyclic "polymeric" chains, hierarchical plastic crystals, and highly ordered solids. In-situ monitoring of the dynamic pathways together with computation reveals interesting and novel phenomena in these systems due to inherent many-body coupling and discreteness at the nanoscale. We expect our study to open new opportunities in understanding the conformation, phase behaviors and collective dynamics on the nanometer length scale that is not accessible using other means.

Tuesday, Sept. 27, 2016
Lecture at 4:00 p.m.
Room 1610, Engineering Hall
Refreshments will be served at 3:45 p.m.