"Colloidal Interactions and Assembly on Energy Landscapes"

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11:15 am - 201 LGRT Alumni Classroom

The ability of nano- and micro-scale components to autonomously and reversibly assemble on energetic templates is broadly considered as an enabling process to numerous emerging technologies (e.g. photonic crystals, nanowires). As a result, there is intense interest in understanding how thermal motion, particle interactions, energetic templates, and external fields can be optimally coupled in assembly processes to elicit desired material and device responses. We approach this problem by directly relating equilibrium and dynamic colloidal microstructures to the combined effects of many-body interactions and $kT$-scale energy landscapes due to physically and chemically patterned surfaces. Colloidal trajectories are measured in 3D real space with nanometer resolution using integrated evanescent wave, video, and confocal microscopy methods. Equilibrium structures are connected to interaction potentials via statistical mechanical analyses, and colloidal dynamics are interpreted using theories for self-diffusion and Stokesian dynamics simulations. Findings from this work provide design rules and control parameters for self- and directed- colloidal assembly processes on energetic patterns. Approaches developed in this work are being extended to investigate biomolecular systems.

Refreshments will be served in at 11:00am and the public is cordially invited to attend.