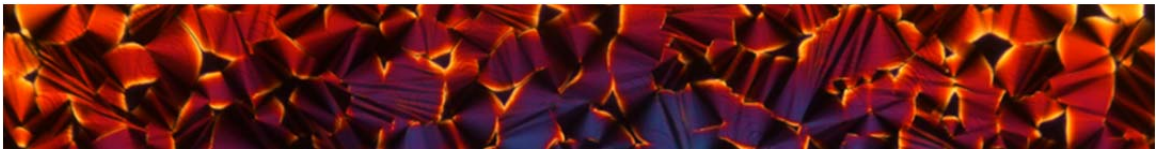

SOFT MATERIALS RESEARCH CENTER

SPECIAL SEMINAR SERIES

Biocompatible Amphiphilic Hydrogel-Solid Dimer Particles as Colloidal Surfactants

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Microemulsions stabilized by surfactant molecules are energetically unstable, slowly coalescing over time. Pickering emulsions stabilized by colloidal particles at the interface are much more stable. Here, we fabricate amphiphilic dimer particles using a hydrogel, the most hydrophilic possible, and achieve a large contrast in the wetting properties of the two bulbs. The novel properties of these particles result in enhanced stabilization of emulsions stabilized by them. We generate monodisperse single emulsions using a flow-focusing microfluidics device. Hydrophobic polymer precipitates from single emulsions and forms a solid bulb at the periphery of the droplet when the emulsion is exposed to acid. Molecular entanglement results in amphiphilic dimer particles that consist of two joint bulbs: one hydrogel bulb of hydrogel in water and the other hydrophobic bulb. Analogous to surfactant molecules at the interface, the resultant amphi-philic particles tend to remain at the water/oil interface with the hydrogel bulb submerged in water and the hydrophobic bulb in oil, and are able to stabilize both water-in-oil and oil-in-water emulsions, suggesting that amphiphilic hydrogel-solid particles are ideal colloidal surfactants for a variety of applications.

Wednesday, June 21st at 1:30 p.m. Duane Physics G126

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