LACNS

Louisiana Consortium for Neutron Scattering

SEMINAR SERIES 2018

Monday, April 2
3:00 pm
1008B Digital Media Center
Louisiana State University

Nature-Inspired "Smart" Materials: Ability to Move, Morph, Destroy and Heal

Our laboratory seeks to engineer the assembly of polymers, surfactants, and nanoparticles into micro- or nanostructured materials. We seek to create "smart" or responsive materials whose properties can be transformed by an external stimulus. The inspiration for our work frequently comes from nature, and extends across the range of length scales.

At the nanoscale, we study molecular self-assembly into structures such as vesicles and micelles. In addition, we have created self-assembling biopolymers that are able to convert liquid blood into a gel; thereby, the materials stop bleeding from serious injuries. A startup company is attempting to commercialize these "hemostatic" materials.

At the microscale, we create polymeric capsules inspired by the architecture and properties of biological cells. Examples include: capsules with many inner compartments; capsules that can "swim" in water in the presence of a chemical fuel; and capsules that can destroy other microscale structures.

At the macroscale, we are developing polymer hydrogels inspired by the responsive properties of plant leaves and aquatic creatures. For example, we have designed hydrogels that transform from a flat sheet to a folded tube in response to a specific cue. We have also designed hydrogel-membranes with the ability to regulate water flow based on temperature, pH, and light.

Guest Speaker

Dr. Srinivasa Raghavan

Patrick & Marguerite Sung Professor,
Department of Chemical & Biomolecular Engineering

University of Maryland

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