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Capillary self-assembly in nature

The bio-structures found in nature are well-adapted to their environments, having gone through selective competition for over a billion years. In this talk, I present three examples of combined theoretical and experimental studies that explore the wisdom of nature.

1. Packing of floating eggs: Mosquito eggs have been observed to self-assemble into coherent packings on the water interface, which prevents such aggregates from sinking.
2. Sinking flowers: a flexible flower on an air-water interface deforms under hydrostatic loadings, which prevents inundation, thereby protecting genetic material.
3. Spider thread as viscous adhesives: the formation of adhesive droplets along the spider thread provides a damping mechanism for the impact of prey.

The common underlying physics of these systems is the interaction between soft bio-structures and fluid forces that give rise to novel phenomena. With time permitted, I will discuss on the locomotive behavior of Nematode in various fluidic environment.

Monday, 9/21

4:00 P.M.

304 Robeson