Center for Fluid Mechanics, Division of Applied Mathematics
Fluids and Thermal Systems Group, School of Engineering
Joint Seminar Series

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Shock-driven Jamming and Periodic Fracture at Particulate Interfaces

A tenuous monolayer of hydrophobic particles at the air-water interface often forms a scum of raft. When such a monolayer is disturbed by the introduction of a localized surfactant droplet, a radially divergent surfactant shock emanates from the origin of the surfactant and packs the particles into a jammed compact annular band that grows with time. The resulting two-dimensional, disordered, elastic solid locally has a packing fraction that saturates and fractures as it is driven outwards radially, to form periodic triangular cracks with robust geometrical features. I will describe a very simple experiment complemented by a minimal molecular dynamics simulation that studies the formation and failure of a disordered solid at the air-water interface.

TUESDAY – NOVEMBER 8, 2011
4:00 PM
Barus & Holley, Room 190