

LadHyX Seminar – April 3rd, 10:45

Michelle Driscoll
(Northwestern University, USA)

Complex fluids under high stress

Why does ketchup flow better when you whack the bottle? Why is oobleck able to transform from a flowing liquid to a solid when you squeeze it? Complex fluids, such as ketchup and oobleck, have mesoscale structure on the scale of tens of microns, and it is local changes to this structure which lead to dramatic changes in flow properties. In my lab, we try to understand these materials using free-surface flows such as drop impact and sheet breakup. We use high-speed imaging, and work with model systems to gain new insight into complex behavior such as solidification under stress. In this talk, I will discuss how I have used this approach to understand both dynamical behavior as well to reveal the in-situ microstructure of these materials. I will discuss two classes of complex fluids, yield stress fluids and shear-thickening fluids, and demonstrate how our measurements offer a new window into the transient behavior of these materials under high stress.