

LadHyX Seminar – September 5, 10:45, – LadHyX Library

Karl Cardin

(Portland State University, currently visiting LadHyX)

Capillary Fluidics: Droplet Capture, Drop Jump, Particle Ejection and More

Drop tower testing provides rare access to fluid dynamics in a microgravity environment where surface tension often dominates the dynamics. Aside from addressing problems in reduced gravity environments, such drop tower testing can provide unique perspectives on many terrestrial problems. A variety of intriguing videos from drop tower tests will be presented and briefly discussed. An experimental study of droplet capture by an array of mesoscale fibres will be discussed in more detail. In the droplet capture experiments, stiff stainless-steel fibre arrays and flexible nylon fibre arrays are used, the latter of which display large oscillations following the droplet impact. With the larger length scales afforded to us by the drop tower, we can accurately record the droplet dynamics, droplet penetration lengths, and fluid equilibrium configurations. A model for the evolution of the droplet position after it enters the fibre array is presented which shows good agreement with experiments.