

Abstract Submitted
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Poking a floating sheet BENNY DAVIDOVITCH, University of Massachusetts Amherst, JIANGSHUI HUANG, Harvard University, NARAYANAN MENON, THOMAS P. RUSSELL, University of Massachusetts Amherst, DOMINIC VELLA, Oxford University — Poking of liquid surface leads to a simple deformation of the surface, whose characteristic scale is nothing but the capillary length. In contrast, the poking of a circular solid sheet floating on a liquid bath demonstrates a surprisingly complex phenomenology, with numerous distinct length scales that are determined by the capillary length as well as by the poking amplitude and the stretching modulus of the sheet. The fundamental physical mechanism that underlies this complex response is intimately related to the emergence of an highly anisotropic stress, whose radial component is tensile and its hoop component is asymptotically compression-free. In this talk I will discuss the various parameter regimes that describe this problem and will identify the characteristic patterns of the poked sheet in these regimes. Experimental results will be presented and compared to theoretical predictions.

Benjamin Davidovitch
University of Massachusetts Amherst

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