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Stabilizing Liquid Drops in Nonequilibrium Shapes by the Interfacial Jamming of Nanoparticles MENGMENG CUI, TODD EMRICK, THOMAS RUSSELL, University of Massachusetts Amherst — Nanoparticles can assemble at the interface between two fluids into a 2-D, forming liquid-like arrays where the nanoparticles can diffuse laterally at the interface. By changing the shape of the liquid domain with an external field, the surface area increases and more nanoparticles adsorb to the interface. By releasing the field, the interfacial area decreases and the nanoparticles are jammed, arresting further change in the shape of the drop. The shapes of the liquid can be tailored and indefinitely remain trapped into shapes far different than spherical indefinitely. Limitations related to the inherent weak forces holding the nanoparticles at the interface are overcome by generating nanoparticle-surfactants in situ. The ability to generate and stabilize liquids with a prescribed shape poses unique opportunities for reactive liquid systems, packaging and delivery, and storage.

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