

Abstract Submitted
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A Sheet on a Drop¹ HUNTER KING, NARAYANAN MENON, University of Massachusetts — We study experimentally the shapes that result when a circular sheet of polystyrene film (diameter 3mm, thickness $t=75-500$ nm) is placed on the surface of an initially spherical water droplet. The competition between surface energies of the fluid interfaces and the elastic stresses in the sheet leads to interesting compromises between their energetically preferred shapes. We report the progression of features that result from continuously varying the droplet volume (and curvature) for various film thicknesses and sizes. For small droplet curvature, the sheet is smoothly stretched. It then develops smooth radial wrinkles at the edges. At larger drop volumes, the azimuthal symmetry is further broken as some wrinkles turn into focused d-cone-like points, and the droplet develops a faceted polygonal flat “table-top.”

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