

Abstract Submitted
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Geometry-ruled deformation of thin elastic shells ARNAUD LAZARUS, Massachusetts Institute of Technology, PEDRO MIGUEL REIS, MIT — We study the mechanical response of thin elastic shells subject to point or plate load and in different mechanical environments (with or without an in-out pressure difference). The geometry and material properties of the ellipsoidal shells used in our experiments can be accurately controlled using digital fabrication techniques. The linear and nonlinear mechanical response of the shells is quantified through load-displacement compression tests and the post-buckling patterns are analyzed using digital imaging. In the linear regime, we explore the geometry-induced rigidity of shells with different shapes. In the nonlinear regime, we focus on the formation of structures with localized curvature, which we denote by s-cones (shell-cones) and examine their mechanical and morphological properties.

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