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Natural Curvature as Effective Confinement in Elastic Sheets OCTAVIO ALBARRAN, Max Planck Institute for Dynamics and Self-Organization, ELENI KATIFORI, University of Pennsylvania, LUCAS GOEHRING, Max Planck Institute for Dynamics and Self-Organization — The wrinkling and folding transitions of thin elastic sheets have been extensively studied in the last decade. The exchange of energy from stretching to bending acts as a paradigm for a wide range of elastic instabilities, including the wrinkling of the gut, and the crinkling of leaves. In two dimensions this type of problem is typically considered by the model of an Euler-*elastica* in compressive confinement. We show that, even without any external forces, an elastic surface supported by a fluid can bend and wrinkle when it acquires a non-**z**ero natural curvature. Locally, we will demonstrate how a preferential curvature can be related to an effective compression, and hence a confining force that can vary spatially. This suggests a simple experimental setup, where we have characterised a variety of wrinkle patterns that can be generated for different mechanical properties and natural curvatures.

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