Radial stretching of thin sheets: A prototypical model for morphological complexity BENNY DAVIDOVITCH, UMass Amherst — The complex morphologies of thin sheets consist of wrinkles, crumples, folds, creases, and blisters. These descriptive words may sound lucid – but do they carry any quantitatively distinguishable content? Following the classical approach of pattern formation theory, we seek to impart a universal meaning to these modes of deformation as distinct types of symmetry-breaking instabilities of a flat, featureless sheet. This idea motivates us to consider the general problem of *axisymmetric stretching* of a sheet. A familiar realization of this problem is the "map maker's conflict": projecting a flat sheet onto a foundation of spherical shape. Another representative realization is the Lame' set-up: exerting a radial tension gradient on a sheet, which may be free-standing or resting on a solid or liquid foundation. I will introduce a set of *generic parameters: bendability, confinement, stiffness, adhesiveness,* that span a phase space for the morphology of radially stretched sheets. In this phase space, wrinkling, crumpling, folding, creasing and blistering could be identified as primary and secondary symmetry-breaking instabilities.

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