

## Period Fissioning and Other Instabilities of Stressed Elastic Membranes

Saturday, 13 December 2008

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Dear All

Professor Benny Davidovitch from University of Massachusetts (Amherst) will visit our labs next Tuesday. The same day he will give a seminar in the Physics Department at 12:50 (USACH, seminar room 3rd floor) about the wrinkling of polymer films near a free boundary (see abstract).

Best regards, Enrique.

(Pictures courtesy of J. Huang and N.Menon)

Abstract: Thin elastic bodies, such as paper sheets or human skin, tend to buckle or to wrinkle when small compressive forces are exerted on their boundaries. This familiar phenomenon is known as Euler buckling. In this talk I will discuss situations in which tensile and compressive forces are exerted simultaneously, in a way that breaks translational symmetry along both principle directions of the membrane. I will present a theory that predicts a multitude of novel morphological phases in various regimes of a 2-dimensional parameter space, defined by the relevant mechanical and geometrical conditions. The parameters are, respectively, the ratio between compression and tension, and the wavelength contrast along the tension direction. In particular, the theory associates the repetitive period fissioning pattern, recently observed on wrinkled membranes floating on liquid and subject to capillary forces (J. Huang et al.) to the characteristic morphology when tension is dominant and the wavelength contrast is large.