

DIRECTION DES SCIENCES DE LA MATIERE,
INSTITUT RAYONNEMENT MATIÈRE DE SACLAY

SERVICE DE PHYSIQUE ET DE CHIMIE DES SURFACES ET DES INTERFACES

SEMINAIRE *

Vendredi 28 Novembre 2008 à 11h00
Bâtiment 466, salle 111 - CEA Saclay, 91191, Gif sur Yvette

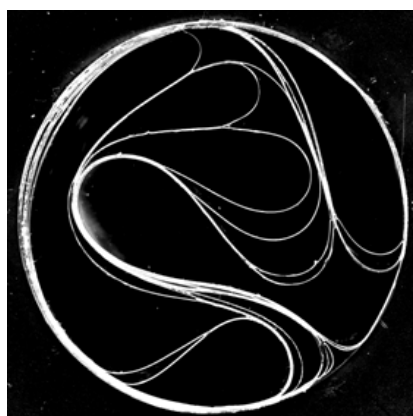
Folding and crumpling of thin elastic sheets: statistical analyses of geometrical and energetical properties

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Invité par Cindy Rountree

Abstract : DNA packaging in viral capsids, or plant leaves growing in buds, are some examples of close-packed low dimensional biological structures. We study the purely mechanical counterparts, such as folded rods and crumpled sheets. I will present our results about geometrical and energetical properties of an elastic sheet, in two compaction experiments. The first experiment consists of pulling a circular polyester sheet from its center through a smaller rigid hole acting as a container (quasi-2d compaction). In this geometry, it is possible to simultaneously record the applied force and observe the folded configurations. Despite the wide variety of possible folded patterns, related to a very complex energetical landscape, elementary patterns are identified, whose geometrical properties and elastic energy, are directly measured. The second experiment consists of crumpling by hand a paper sheet (3d compaction). Geometrical properties are measured in the folded configurations. Characteristic length-scales of these crumpled 3d-networks are extracted and compared with other studies from the literature. Our results suggest to focus on these elementary patterns (like “particles”), in order to understand “thermal equilibration” in close-packed systems, and microscopic distributions of energy, by means of statistical physics tools.



* SERA PRECEDE D'UNE PAUSE-CAFE A PARTIR DE 10H30

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