PHYSICAL MATHEMATICS SEMINAR

Imposing Curved Shapes on Solid Sheets: Instabilities, Isometries, and Asymptotic Isometries

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ABSTRACT:

Imposing a curved shape (of nonzero Gaussian curvature) on a solid sheet, generates in it elastic stress. This familiar motif is a consequence of Gauss' *theorema Egregium*, which posits that there exists no isometric map between two surfaces of different Gaussian curvatures. This coupling between geometry (curvature) and mechanics (stress) underlies the morphological richness observed in solid sheets, and their nontrivial response to exerted forces.

In this talk I will attempt to provide a unifying framework of this geometry-mechanics interplay, demonstrating how a Gaussian curvature can (or cannot) be accommodated by solid sheets. Three examples will be discussed: a sheet attached to liquid drop, an indentation of a floating sheet, and a twisted ribbon.

TUESDAY, OCTOBER 21, 2014
2:30 PM
Building E17, Room 122

Reception following in Building E17, Room 401A
(Math Dept. Common Room)

http://math.mit.edu/pms/

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