**Professor Martine Ben Amar**

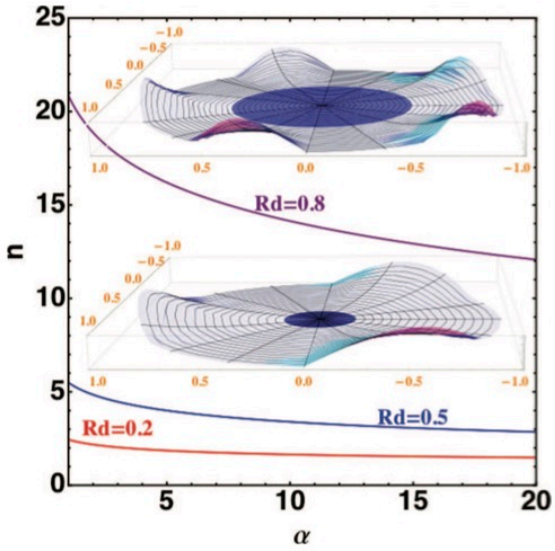


Fig. 4: The buckling instability which takes place after delamination for various values of the radius of the stuck area (colored in blue). Continuous curves give the number of oscillations $n$ *vs.* the reduced coefficient $\alpha = 6\gamma(g_\theta - 1/g_\theta)R_0^2/H_0^2$ in the limit $g_\theta \to 1$.

From: Patterns in biofilms: from contour undulations to fold focusing", EPL, Vol. 108, 38003, 2014

See:
http://www.phys.ens.fr/~benamar/benamar_en.php
http://www.phys.ens.fr/~benamar/index_en.php
https://www.researchgate.net/profile/Martine_Ben_Amar2/publications
http://www.mathpubs.com/author/Martine+Ben+Amar
http://www.pubfacts.com/author/Martine+Ben+Amar
http://www.upmc.fr/fr/recherche/creatrices_de_futurs.html
http://dissem.in/researcher/3622/

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**Research Interests of the Martine Ben Amar Group on Physics and Mechanics of Soft Matter:**
The group is interested in various aspects of growth, shapes and dynamics in physics, biophysics, mechanics and biomechanics. Using theoretical models, experiments as well as numerical simulations, we are trying to highlight the physical principles common to a broad range of morphogenetic events. The area of research that are currently under investigation are:

- Growth of skin tumors.
- Morphogenesis in vegetal and animal tissues.
- Biomechanics, nonlinear elasticity, viscoelasticity and rheology of complex matter.
- Elastic singularities.
- Mechanical properties of polymeric gels.
- Thin sheets of liquid crystals.

- Biological membranes, rafts and inclusions.
- Faraday instability.

Moreover, during the past five years, the group has actively worked on the following topics:

- Viscous fingering, wetting, dynamics of the contact line.
- Crumpled paper, statistics of folds.

**Biography** (translated from http://www.upmc.fr/fr/recherche/creatrices_de_futurs.html)**:**
"I am a woman driven by passion of science: understanding, show, predict the laws of the universe and life." She holds a doctorate in atomic physics. Martine Ben Amar as taught physics at UPMC since 1993. Elected senior member of the IUF in 2011, the professor was invited to MIT on McCarthy Chair from 1999 to 2000. Her preferred themes are the modeling of the cancer, the physics of cell morphogenesis and of soft tissue growth. With PhD students and postdocs, Martine Ben Amar is responsible for the federation "Dynamics of Complex Systems", bringing together 200 researchers and professors at UPMC, Université Paris-Diderot, the ENS and of ESCPI.

**Selected Publications:**

Ben Amar, M., and Pomeau, Y., 1997, "Crumpled Paper," Proc. R. Soc. London, Ser. A, 453, pp. 729–755

Boudaoud A, Patricio P, Couder Y, Ben Amar M. Dynamics of singularities in a constrained elastic plate. Nature 2000;407:718–20.

A. Goriely and M. Ben Amar, ''On the Definition and Modeling of Incremental, Cumulative, and Continuous Growth Laws in Morphoelasticity," ENS-LPS Report No. BA2005-1, 2005

Ben Amar, M. & Goriely, A. Growth and instability in elastic tissues. J. Mech. Phys. Solids. 53, 2284–2319 (2005).

Alain Goriely and Martine Ben Amar, "Differential Growth and Instability in Elastic Shells", Phys. Rev. Lett. 94, 198103 (2005)

A. Goriely, M. Destrade and M. Ben Amar, "Instabilities in elastomers and in soft tissues", arXiv:0711.4664v1 [cond-mat.soft] 29 Nov 2007

Dervaux J. and Ben Amar M., Phys. Rev. Lett., 101 (2008) 068101

Goriely A. and Moulton D., New trends in the Physics and Mechanics of Biological Systems, Lecture Notes of the Les Houches Summer School, edited by Ben Amar M., Goriely A., Mueller M. M. and Cugliandolo L. F., Vol. 92 (Oxford University Press, Oxford) 2009

Julien Dervaux, Pasquale Ciarletta and Martin Ben Amar, "Morphogenesis of thin hyperelastic plates: A constitutive theory of biological growth in the Foppl-von Karman limit", Journal of the Mechanics and Physics of Solids, Vol. 57, No. 3, pp 458-471, March 2009

Julien Dervaux and Martine Ben Amar, "Elastic growth in thin geometries", Origins of Life: Self-Organization and/or Biological Evolution?, pp79-84, September 2009,

Julien Dervaux and Martine Ben Amar, “Localized growth of layered tissues”, IMA Journal of Applied Mathematics, Vol. 75, No. 4, pp 571-580, April 2010

Martine Ben Amar and Pasquale Ciarletta, “Swelling instability of surface-attached gels as a model for tissue growth under geometric constraints”, Journal of the Mechanics and Physics of Solids, Vol. 58, No. 7, pp 935-954, July 2010

Norbert Stoop, Falk K. Wittel, Martine Ben Amar, Martin Michael Müller and Hans J. Herrmann, “Self-contact and instabilities in the anisotropic growth of elastic membranes”, Physics Review Letters, Vol. 105, 068101, August 2010

Julien Dervauz, Yves Couder, Marie-Alice Guedeau-Boudeville and Martine Ben Amar, “Shape transition in artificial tumors: from smooth buckles to singular creases”, Physics Review Letters, Vol. 107, 018103, July 2011

Dervaux, J.; Ben Amar, M. Buckling Condensation in Constrained Growth. J. Mech. Phys. Solids 2011, 59, 538–560

Ben Amar M. and Jia F., Proc. Natl. Acad. Sci. U.S.A., 110 (2013) 10525

Martine Ben Amar and Min Wu, “Patterns in biofilms: from contour undulations to fold focusing”, EPL, Vol. 108, 38003, 2014

Wu M. and Ben Amar M., to be published in Biomech. Model. Mechanobiol., DOI:10.1007/s10237-014-0609-1