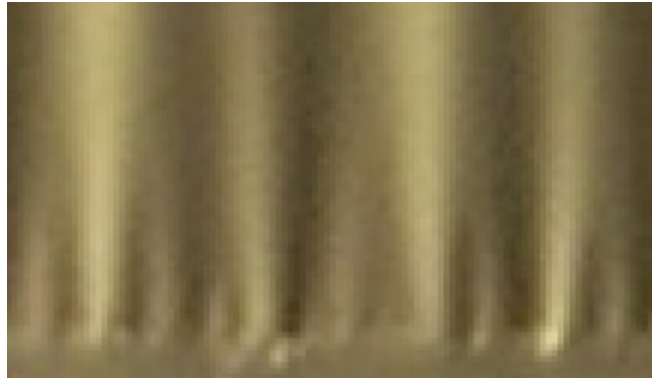




**Professor Benny Davidovitch**



From: <https://blogs.umass.edu/bdavidov/>  
Wrinkles in a curtain

See:

<https://blogs.umass.edu/bdavidov/>

<http://nepr.net/news/2012/06/18/umass-physicists-unveil-magic-wrinkling-and-crumpling/>

Condensed Matter Physics Group  
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University of Massachusetts - Amherst

**Research Interests:**

Professor Davidovitch writes: “My research interests are primarily in the physics of soft matter, and in non-equilibrium physics. In particular, I study mechanisms for pattern formation in elastic membranes (e.g. wrinkling and crumpling), fluids (e.g. capillary waves and shear banding), and solids (e.g. sputtering-induced nanopatterning).

From <http://nepr.net/news/2012/06/18/umass-physicists-unveil-magic-wrinkling-and-crumpling/>

By Susan Kaplan, June 18, 2012:

When you crumple a piece of paper and throw it in the trash, ever think about the physics of how, exactly, that flat piece of material transforms into a little ball? How to describe it mathematically? It’s a problem that’s eluded scientists for millennia. Now UMass Amherst physicists say they’ve solved it. Professor Benny Davidovitch and doctoral student Hunter King say they’ve used high-end math and physics to describe the mechanics of two distinct kinds of deformation: wrinkling and crumpling. A subject that is familiar to most people and common in everyday life.

**Selected Publications:**

Davidovitch B. Period fissioning and other instabilities of stressed elastic membranes. *Phys Rev E Stat Nonlin Soft Matter Phys.* 2009;80:025202(R)

Jiangshui Huang, Benny Davidovitch, Christian Santangelo, Thomas P. Russell, Narayanan Menon, “A smooth cascade of wrinkles at the edge of a floating elastic film”, Cornell University Library, arXiv:0901.2892 [cond-mat.soft], DOI: 10.1103/PhysRevLett.105.038302, 19 January, 2009, *Physical Review Letters*, Vol. 105, No. 3, 2010

B. Davidovitch, R.D. Schroll, D. Vella, M. Adda-Bedia, and E. Cerda, “Prototypical model for tensional wrinkling in thin sheets”, PNAS, 108(45):18227–18232, 2011.

H. King, R. D. Schroll, B. Davidovitch, and N. Menon. Elastic sheet on a liquid drop reveals wrinkling and crumpling as distinct symmetry-breaking instabilities. Proc. Natl. Acad. Sci. USA, 109(25):9716–20, June 2012.

Davidovitch B, Schroll RD, Cerda E., “Nonperturbative model for wrinkling in highly bendable sheets”, Phys. Rev. E Stat. Nonlin. Soft Matter Phys, Vol. 6, No. 2, 066115, June 2012

Vincent Demery, Benny Davidovitch and Christian D. Santangelo, “Mechanics of large folds in thin interfacial films”, arXiv:1407.4092v2 [cond-mat.soft], 16 July 2014

Evan Hohlfeld and Benny Davidovitch, “A sheet on deformable sphere: ‘wrinklogami’ patterns suppress curvature-induced delamination”, arXiv:1411.5880v1 [cond-mat.soft], 20 November 2014

Michael Taylor, Benny Davidovitch, Zhanlong Qiu, Katia Bertoldi, “A comparative analysis of numerical approaches to the mechanics of elastic sheets”, arXiv:1411.6823v1 [cond-mat.mtrl-sci], 25 November , 2014

Vella, D., Huang, J., Menon, N., Russell, T. P. & Davidovitch, B., “Indentation of ultrathin elastic films and the emergence of asymptotic isometry”, Phys. Rev. Lett. 114, 014301 (2015).

D. Vella, H. Ebrahimi, A. Vaziri and B. Davidovitch, “Wrinkling reveals a new isometry of pressurized elastic shells”, EPL Journal ([www.epljournal.org](http://www.epljournal.org)), Vol. 112, 24007, 2015, DOI: 10.1209/0295-5075/112/24007

Dominic Vella, Hamid Ebrahimi, Joseph Paulsen, Ashkan Vaziri, Narayanan Menon, and Benny Davidovitch, “Poking around: how indentation reveals wrinkly isometries”, Abstract ID BAPS.2016.MAR.P40.2, Paper given at American Physical Society (APS) meeting on March 16, 2016 in Baltimore, Maryland, in Session P40: More Geometry and Dynamics: Wrinkling, Folding, Snapping, etc.

Joseph D. Paulsen, Vincent Demery, K. Bugra Toga, Zhanlong Qiu, Benny Davidovitch, Thomas P Russell and Narayanan Menon, “Geometry-driven folding transitions in floating thin films”, Abstract ID BAPS.2016.MAR.P40.3, Paper given at American Physical Society (APS) meeting on March 16, 2016 in Baltimore, Maryland, in Session P40: More Geometry and Dynamics: Wrinkling, Folding, Snapping, etc.

Joseph D. Paulsen, Evan Hohlfeld, Hunter King, Jiangshui Huang, Zhanlong Qiu, Thomas P. Russell, Narayanan Menon, Dominic Vella and Benny Davidovitch, “Curvature-induced stiffness and the spatial variation of wavelength in wrinkled sheets”, Proceedings of the National Academy of Sciences of the United States of America (PNAS), Vol. 113, No. 5, February 2016

Yiwei Sun, Benny Davidovitch and Gregory Grason (University of Massachusetts – Amherst), “Wrinkling instability induced by imposed Gaussian curvature in the zero-tension limit”, Abstract ID BAPS.2016.MAR.P40.9, Paper given at American Physical Society (APS) meeting on March 16, 2016 in Baltimore, Maryland, in Session P40: More Geometry and Dynamics: Wrinkling, Folding, Snapping, etc.