

---

# Robert D. Schroll

Departamento de Fisica  
Universidad de Santiago de Chile  
Av. Ecuador 3493  
Estacion Central  
Santiago, Chile

rschroll@gmail.com  
+56-2-718203  
<http://rschroll.github.com>

## Research Interests

Elastic sheets and membranes, fluid surfaces and interfaces, fluid dynamics, soft condensed matter, non-linear systems, optics, biologically-inspired physics

## Employment

Postdoctoral Researcher, <i>Universidad de Santiago de Chile</i> Under the supervision of Profs. Eugenio Hamm and Enrique Cerda	2012–present
Postdoctoral Researcher, <i>University of Massachusetts, Amherst</i> Under the supervision of Prof. Benny Davidovitch.	2009–2011

## Education

PhD, <i>University of Chicago</i> Under the supervision of Prof. Wendy W. Zhang.	2003–2009
BS in Physics, BS in Math, <i>University of Maryland</i> Graduated <i>summa cum laude</i> . Completed Honors and Gemstone programs.	1999–2003

## Honors and Awards

FONDECYT Postdoctoral Project Award	2011–2012
National Science Foundation Graduate Research Fellowship	2003–2006
University System of Maryland Regents' Scholarship	1999–2003
Maryland Distinguished Scholar Scholarship	1999–2003
Maryland Senior Summer Scholars Grant	2001

## Publications

A prototypical model for tensional wrinkling in thin sheets. Benny Davidovitch, Robert D. Schroll, Dominic Vella, Mokhtar Adda-Bedia, and Enrique Cerda. *Proc. Nat. Acad. Sci.* **108**, 18227 (2011).

Elastic building blocks for confined sheets. Robert D. Schroll, Eleni Katifori, and Benny Davidovitch. *Phys. Rev. Lett.* **106**, 074301 (2011).

Impact of a viscous liquid drop. Robert Schroll, Christophe Josserand, Stéphane Zaleski, and Wendy Zhang. *Phys. Rev. Lett.* **104**, 034504 (2010).

Laser microfluidics: Fluid actuation by light. Jean-Pierre Delville, Mattheieu Robert de Saint Vincent, Robert D. Schroll, Hamza Chraïbi, Bruno Issenmann, Régis Wunenburger, Didier Lasseux, Wendy W. Zhang, and Etienne Brasselet. *J. Opt. A* **11**, 034015 (2009).

Robert Schroll. *Solid Substrate and Head-on Impact of Viscous Drops*. Ph.D. thesis, University of Chicago (2009).

Bridging dielectric fluids by light: A ray optics approach. Robert D. Schroll, Etienne Brasselet, Alexis Casner, Wendy W. Zhang, and Jean-Pierre Delville. *Eur. Phys. J. E* **26**, 405 (2008).

Liquid transport due to light scattering. Robert D. Schroll, Régis Wunenburger, Alexis Casner, Wendy W. Zhang, and Jean-Pierre Delville. *Phys. Rev. Lett.* **98**, 133601 (2007).

Generalized synchronization of spatiotemporal chaos in a liquid crystal spatial light modulator. Elizabeth A. Rogers, Rita Karla, Robert D. Schroll, Atsushi Uchida, Daniel P. Lathrop, and Rajarshi Roy. *Phys. Rev. Lett.* **93**, 084101 (2004).

Si(111) step fluctuations in reflection electron microscopy at 1100°C: Anomalous step-step repulsion. Robert D. Schroll, Saul D. Cohen, Theodore L. Einstein, Jean-Jacques Métois, Hailu Gebremariam, Howard L. Richards, and Ellen D. Williams. *Appl. Surf. Sci.* **212**, 219 (2003).

Si(111) step fluctuations at high temperature: Anomalous step-step repulsion. Saul D. Cohen, Robert D. Schroll, Theodore L. Einstein, Jean-Jacques Métois, Hailu Gebremariam, Howard L. Richards, and Ellen D. Williams. *Phys. Rev. B* **66**, 115310 (2002).

## In Preparation

Near and far from threshold analysis of elastic plates. Ariel Arza, Robert D. Schroll, and Enrique Cerda. *In preparation*.

A nonperturbative model for wrinkling in highly bendable sheets. Benny Davidovitch, Robert D. Schroll, and Enrique Cerda. *Submitted to Phys. Rev. Lett.*

A sheet on a drop reveals wrinkling and crumpling as distinct symmetry-breaking instabilities. Hunter King, Robert D. Schroll, Benny Davidovitch, and Narayanan Menon. *Submitted to Proc. Nat. Acad. Sci.*

Simulating thin elastic sheets with the surface evolver. Lee A. Walsh, Robert D. Schroll, and Benny Davidovitch. *In preparation.*

## Presentations

The wrinkling behavior of highly bendable thin sheets. Robert D. Schroll, Benny Davidovitch, and Enrique Cerda. *Computations in Science Seminar*, Chicago, IL (March 2012).

The wrinkle transition of a sheet on a drop. Robert D. Schroll, Hunter King, Benny Davidovitch, and Narayanan Menon. *APS March Meeting*, Boston, MA (February 2012).

Far-from-threshold analysis of a drop on a sheet. Robert D. Schroll, Hunter King, Benny Davidovitch, and Narayanan Menon. *Mini-Workshop: Elasticity & Geometry*, Santiago, Chile (January 2012).

Wrinkling and crumpling as distinct symmetry breaking instabilities of a sheet on a drop. Robert D. Schroll, Hunter King, Benny Davidovitch, and Narayanan Menon. *New England Workshop on the Mechanics of Materials and Structures*, Boston, MA (October 2011).

The shapes of elastic curtains. Robert D. Schroll, Eleni Katifori, and Benny Davidovitch. *Soft Matter Research in Theory Research Presentation*, Amherst, MA (July 2011).

Elastic building blocks in a wrinkle cascade. Robert D. Schroll, Eleni Katifori, and Benny Davidovitch. *IMA Workshop "Strain Induced Shape Formation: Analysis, Geometry and Materials Science"*, Minneapolis, MN (May 2011).

Building blocks for the shapes of confined elastic sheets. Robert D. Schroll, Eleni Katifori, and Benny Davidovitch. *APS March Meeting*, Dallas, TX (March 2011).

Diffuse-stress regions in confined elastic sheets. Robert D. Schroll, Eleni Katifori, and Benny Davidovitch. *Polymer Poster Symposium*, Amherst, MA (October 2010).

Diffuse-stress regions in confined elastic sheets. Robert D. Schroll, Eleni Katifori, and Benny Davidovitch. *New England Workshop on the Mechanics of Materials and Structures*, Boston, MA (September 2010).

A curtain-type problem: pattern formation on uniaxially confined sheet with deformed edge. Robert D. Schroll, Eleni Katifori, and Benny Davidovitch. *APS March Meeting*, Portland, OR (March 2010).

The impact of viscous liquid drops. Robert D. Schroll, Wendy W. Zhang, Christophe Josserand, and Stéphane Zaleski. *Computations in Science Seminar*, Chicago, IL (July 2009).

The impact of viscous liquid drops. Robert D. Schroll, Wendy W. Zhang, Christophe Josserand, and Stéphane Zaleski. *Special Seminar*, Amherst, MA (May 2009).

The impact of viscous liquid drops. Robert D. Schroll, Wendy W. Zhang, Christophe Josserand, and Stéphane Zaleski. *Applied Mathematics Seminar*, Merced, CA (April 2009).

Impact of a viscous drop. Wendy Zhang, Robert Schroll, Christophe Josserand, and Stéphane Zaleski. *APS March Meeting*, Pittsburgh, PA (March 2009).

Head-on collisions of viscous drops. Robert Schroll, Christophe Josserand, Stéphane Zaleski, and Wendy Zhang. *APS Division of Fluid Dynamics Annual Meeting*, San Antonio, TX (November 2008).

Drop impact dynamics. Robert Schroll, Christophe Josserand, Stéphane Zaleski, and Wendy Zhang. *Geometrical Singularities and Singular Geometries*, Minneapolis, MN (July 2008).

Liquid flow driven by light scattering. Robert D. Schroll, Wendy W. Zhang, Alexis Casner, Régis Wunenburger, and Jean-Pierre Delville. *IMA Summer Program, Geometrical Singularities and Singular Geometries*, Minneapolis, MN (July 2008).

Impact of a large-viscosity liquid drop: Rim dynamics. Robert Schroll, Christophe Josserand, Stéphane Zaleski, and Wendy Zhang. *APS Division of Fluid Dynamics Annual Meeting*, Salt Lake City, UT (November 2007).

Liquid transport and jetting via light scattering. Robert D. Schroll, Bruno Issenmann, Wendy W. Zhang, Alexis Casner, Jean-Pierre Delville, and Régis Wunenburger. *APS Division of Fluid Dynamics Annual Meeting*, Tampa, FL (November 2006).

Viscous effects in drop impact. Roberto Zamora, Robert Schroll, Francois Blanchette, and Wendy Zhang. *APS Division of Fluid Dynamics Annual Meeting*, Tampa, FL (November 2006).

Optical streaming: Flows and interface deformations driven by light scattering. Robert D. Schroll, Wendy W. Zhang, Alexis Casner, Régis Wunenburger, and Jean-Pierre Delville. *Dynamics Days*, Bethesda, MD (January 2006).

Flows and interface deformations driven by light scattering. Robert D. Schroll, Wendy W. Zhang, Alexis Casner, Jean-Pierre Delville, and Régis Wunenburger. *APS Division of Fluid Dynamics Annual Meeting*, Chicago, IL (November 2005).

Optical streaming: Flows and interface deformations driven by light scattering. Robert D. Schroll, Wendy W. Zhang, Alexis Casner, Régis Wunenburger, and Jean-Pierre Delville. *Focusing Stresses on Soft Interfaces Workshop*, Chicago, IL (November 2005).

Bridging by light. Robert D. Schroll and Wendy W. Zhang. *University of Chicago Brown-Bag Seminar*, Chicago, IL (September 2004).

Investigating steps on Si(111): Calculating the step stiffness parameter  $\tilde{\beta}$ . Robert D. Schroll and Theodore L. Einstein. *Thermo-2002*, College Park, MD (April 2002).

## Teaching

TA for Intermediate Mechanics, *University of Chicago* Winter, 2008  
Ran discussion and graded for class of 50.

## Service

Co-organizer of Soft Matter Journal Club, *University of Massachusetts* 2009–2011  
Scheduled and advertised discussions of current journal articles.

Co-organizer of Computations in Science Seminar, *University of Chicago* 2006–2008  
Prepared schedules for visiting speakers and publicized the talks.

Presenter at *Physics with a Bang!* open house, *University of Chicago* 2007, 2008  
Briefly described my work to visiting members of the public.

Assistant at *Physics is Fun* programs, *University of Maryland* 2001–2003  
Ran demonstrations for visiting members of the public.

## Recreational Activities

Florence Community Band

The Expandable Brass Band

City league softball