

Brian DiDonna Curriculum Vitae

Department of Chemical Engineering
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Education

- 2001 **Ph.D. Physics** University of Chicago, Chicago, IL
Dissertation: "Scaling of the buckling transition of ridges in thin sheets"
Advisor Tom Witten
- 2000 **M.S. Physics** University of Chicago, Chicago, IL
- 1994 **B.S. Physics** cum laude, Stanford University, Palo Alto, CA

Professional Experience

- 2006 – **Post Doctoral Fellow** Department of Chemistry and Biochemistry,
University of California, Los Angeles
- 2006 **Post Doctoral Fellow** Department of Chemical Engineering, University of Minnesota
- 2004 – 2006 **Post Doctoral Fellow** Institute for Mathematics and its Applications,
University of Minnesota
- 2001 – 2004 **Post Doctoral Fellow** Department of Physics and Astronomy, University of Pennsylvania
- 1995 – 2001 **Graduate Student** Department of Physics, University of Chicago
- 1993 – 1995 **Researcher** Gravity Probe B Project, Stanford University

Teaching Experience

- 2006 **Intensive Precalculus** Math 1155, University of Minnesota
- 1999 **Candidacy Preparation Instructor** Department of Physics, University of Chicago

Professional Activities

- 2004 – 2005 **Thematic Year on Mathematics of Materials and Macromolecules: Multiple Scales, Disorder,
and Singularities** Institute for Mathematics and its Applications,
University of Minnesota
- 2004 – 2005 **Organizer, Postdoc Seminar Series** Institute for Mathematics and its Applications,
University of Minnesota
- 2002 **Boulder School for Condensed Matter Physics** University of Colorado
- 2002 **Visiting Scholar** Université Paris-Sud, Orsay, FR
- 1999 – 2001 **Journal Club** Department of Physics, University of Chicago
- 1998 **Graduate Admissions Committee** Department of Physics, University of Chicago

Awards, Fellowships

- 2001 **Sidney Bloomenthal Fellowship**
Department of Physics, University of Chicago
- 1995 – 1997 **Graduate Assistance in the Areas of National Need (GAANN) Fellowship**
U.S. Department of Education
- 1994 **Firestone Medal for Excellence in Research**
Department of Physics, Stanford University

Invited Presentations and Colloquia

- “The smectic blue phase: a study in geometric frustration” Wayne State University, Detroit, Michigan, December, 2005.
- “Curvature in Competition” Syracuse University, Syracuse, New York, January 2005.
- “Curvature in Competition” University of St. Thomas, St. Paul, Minnesota, December 2004.
- “Energy Condensation in Crumpled Elastic Sheets” SIAM Conference on Analysis of Partial Differential Equations, Houston, Texas, December 2004.
- “Smectic Blue Phases: Layered Systems with High Intrinsic Curvature” New England Complex Fluids Workshop, Amherst, Massachusetts, June 2004.
- “Smectic Phases with Cubic Symmetry: The Splay Analog of the Blue Phase” SIAM Conference on Mathematical Aspects of Materials Science, Los Angeles, California, May 2004.
- “Energy Condensation in Crumpled Sheets” Non-linear Theory Division, Los Alamos National Laboratory, Los Alamos, New Mexico, May 2003.
- “Smectic Phases with Cubic Symmetry: The Splay Analog of the Blue Phase” Catholic University, Washington D.C., April 2003.
- “Defected Phases with Cubic Symmetry: The Splay Analog of the Blue Phase” March Meeting, Austin, Texas, March 2003.
- “Energetics of Crumpling” 3rd International Meeting of Origami Science, Math and Education, Monterey, California, March 2001.

Contributed Conference Presentations

- B.A. DiDonna, A.J. Levine “Filamin cross-linkers as rheology regulators in biopolymer networks” APS March Meeting, Baltimore, Maryland, March 2006.
- B.A. DiDonna, T.C. Lubensky, P.A. Janmey, “Nonaffinity and nonlinearity in random elastic networks” APS March Meeting, Los Angeles, California, March 2005.
- B.A. DiDonna, A.J. Levine, “Criticality in actin-filamin networks” APS March Meeting, Los Angeles, California, March 2005.
- B.A. DiDonna, T.C. Lubensky, P.A. Janmey, F.C. MacKintosh, “A simulational study of the non-linear elasticity of biopolymer gels” APS March Meeting, Montreal, Quebec, Canada, March 2004.
- B.A. DiDonna, T.A. Witten, “Scaling of Buckling” APS March Meeting, Indianapolis, Indiana, March 2002.
- B.A. DiDonna, S.C. Venkataramani, T.A. Witten, “Structures and Scaling in High Dimensional Crumpling” Sixth Siam Conference on Applications of Dynamical Systems, Snowbird, Utah, May 2001.
- B.A. DiDonna, S.C. Venkataramani, T.A. Witten, E.M. Kramer, “Searching for Ridges in Dimensions Above Three” APS March Meeting, Minneapolis, Minnesota, March 2000.
- B.A. DiDonna, T.A. Witten, J.B. Young, W. Kang, “An Analysis of Coupling Between a Collapsing Bubble and an Applied Magnetic Field” Symposium on Sonoluminescence, Chicago, Illinois, September 1997.
- B. DiDonna, R.W. Brumley, S. Buchman, “Ultraviolet Transmissivity of Quartz Optical Fibers Under Proton Bombardment” APS March Meeting, San Jose, California, March 1995.

Recent Seminars

Sandia Laboratories (August 2006)
University of California, Los Angeles (May 2006)
Penn State University (October 2005)
University of California, Los Angeles (September 2005)
University of North Carolina (April 2005)
Syracuse University (January 2005)
University of Minnesota (January 2005)
Syracuse University (January 2004)
Exxon Labs (October 2002)
Columbia University (May 2002)
University of Minnesota (May 2002)
Universite Paris Sud XI (April 2002)
Ecole Superieure de Physique Chimie Industrielles (April 2002)
Brown University (February 2002)

Professional Memberships

American Physical Society
Society for Industrial and Applied Mathematics

References

Tom Witten

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John Crocker

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Alex J. Levine

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Publications

- (13) B.A. DiDonna, K.I. Winey, "Flow alignment effects on nanowire conductivities" *in preparation*.
- (12) B.A. DiDonna, P.J. in't Veld, D.C. Morse, "A simulational study of gel topology in chemically cross-linked semiflexible polymers" *in preparation*.
- (11) B.A. DiDonna, A.J. Levine, "Filamin cross-linkers as rheology regulators in biopolymer networks" *submitted to Physical Review E*.
- (10) B.A. DiDonna, A.J. Levine, "Filamin cross-linked semiflexible networks: Fragility under strain" *Physical Review Letters* **97** 068104 (2006).
- (9) B.A. DiDonna, T.C. Lubensky, "Nonaffine correlations in random elastic media" *Physical Review E* **72** 066619 (2005).
- (8) B.A. DiDonna, R.D. Kamien, "Smectic blue phases: layered systems with high intrinsic curvature" *Physical Review E* **68** 041703 (2003).
- (7) G.M. Grason, B.A. DiDonna, R.D. Kamien, "A geometric theory of diblock copolymer phases" *Physical Review Letters* **91** 058304 (2003).
- (6) B.A. DiDonna, Randall D. Kamien, "Smectic phases with cubic symmetry: the splay analog of the blue phase" *Physical Review Letters* **89** 215504 (2002).
- (5) B.A. DiDonna, "Scaling of the buckling transition of ridges in thin sheets" *Physical Review E* **66** 016601 (2002).
- (4) B.A. DiDonna, T.A. Witten, "Anomalous strength of membranes with elastic ridges" *Physical Review Letters* **87** 206105 (2001).
- (3) B.A. DiDonna, S.C. Venkataramani, T.A. Witten, E.M. Kramer, "Singularities, structures and scaling in deformed m-dimensional elastic manifolds" *Physical Review E* **65** 016603 (2001).
- (2) B.A. DiDonna, T.A. Witten, J.B. Young, "Sonoluminescence: coupling to an applied magnetic field" *Physica A* **258** 263 (1998).
- (1) S. Buchman, F. Everitt, et. al., "Experimental techniques for gyroscope performance enhancement for the gravity probe B relativity mission" *Classic and Quantum Gravity* **13** (11A) A185, Suppl. S (1996).

Reviews and Conference Proceedings

- B.A. DiDonna and T.C. Lubensky, "Comment on "Correlations in the Elastic Response of Dense Random Packings"" *to appear in Physical Review Letters*.
- B.A. DiDonna, "Crumpling, a look inside the creases" *Nature Materials* **5**, 167 (2006).
- B.A. DiDonna, "To fold or to crumple?" in *Origami 3: Third International Meeting of Origami Science, Mathematics, and Education Sponsored by Origami USA*, edited by Thomas Hull (A K Peters Ltd, Natick, MA, 2002)