

M. Lisa Manning

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RESEARCH INTERESTS Soft Matter and Biophysics. Modeling and analysis of structure, deformation, and flow in glassy materials and biological tissues using theory and simulations.

EDUCATION **University of California, Santa Barbara, California, USA**
 Ph.D. Physics, September 2008; **Area of specialization:** Condensed Matter
 Dissertation: *Effective temperature and strain localization in amorphous solids*
 Committee: Ralph Archuleta, Jean Carlson (advisor), James Langer
 M.A. Physics, May 2005

University of Virginia, Charlottesville, Virginia USA
 B.S. Physics, *with highest distinction*, 2002
 B.A. Mathematics, 2002

RESEARCH EXPERIENCE **Princeton University, Center for Theoretical Science, Princeton, NJ USA**
2008-present *Postdoctoral Fellow*
 Collaborators: Eva-Maria Schoetz, Andrea Liu, Mikko Haataja, Thomas Gregor
 Projects: Modeling of surface tension and flow in developing zebrafish embryos – identifying structural defects in disordered packings – analyzing mechanical properties of drosophila embryos

University of California, Santa Barbara Department of Physics, USA
2003-2008 *Graduate Research Assistant*
 Collaborators: Jean M. Carlson, James S. Langer, Bassam Bamieh, John Doyle
 Projects: shear banding instabilities and material failure in structural glasses — transition to turbulence in fluid flowing past a compliant membrane — numerical methods for solving hydrodynamic eigenvalue problems — highly optimized tolerance (HOT) model for complex systems

University of Virginia, Dept. of Physics, Charlottesville, Virginia USA
1999-2002 *Undergraduate Research Assistant*
 Advisor: Dr. Brad Cox
 Project: KTeV fixed target experiment, Fermilab

Summer 2001 *Energy Research Undergraduate Laboratory Fellow*
 Advisor: Dr. Michael Kelsey
 Project: Restoring BaBar prototype drift chamber, SLAC

PUBLICATIONS

M. L. Manning, R. A. Foty, M. S. Steinberg, and E.-M. Schoetz, "Coaction of intercellular adhesion and cortical tension specifies tissue surface tension," *Proc. Nat. Acad. Sci.* **107**, 28 12517-12522 , (2010).

E. G. Daub, M. L. Manning and J. M. Carlson, "Pulse-like, crack-like and supershear earthquake ruptures with shear strain localization," *J. Geophys. Res.* **115**, B05311, (2010).

M. L. Manning, E. G. Daub, J. S. Langer and J. M. Carlson, "Rate dependent shear bands in a shear transformation zone model for amorphous solids," *Phys. Rev. E* **79**, 016110, (2009).

M. L. Manning, "Effective temperature and strain localization in amorphous solids," *Dissertation, University of California Santa Barbara*, (2008).

E. G. Daub, M. L. Manning and J. M. Carlson, "Shear strain localization in elastodynamic rupture simulations," *Geophysical Research Letters* **35**, L12310, (2008).

J. S. Langer and M. L. Manning, "Steady-state, effective-temperature dynamics in a glassy material," *Phys. Rev. E* **76**, 056107, (2007).

M. L. Manning, J. S. Langer and J. M. Carlson, "Strain localization in a shear transformation zone model for amorphous solids," *Phys. Rev. E* **76**, 056106, (2007).

M. Manning, J. M. Carlson and J. Doyle, "Highly Optimized Tolerance in dense and sparse resource regimes," *Phys. Rev. E* **72**, 016108, (2005).

IN PREPARATION

M. L. Manning and A. J. Liu, "Identifying soft spots in sheared granular packings," *in preparation for submission to Phys. Rev. Lett.*, (2010).

M. L. Manning, J. Talbot and E.-M. Schoetz, "A minimal cell-cell interaction model for embryonic tissues," *in preparation for submission to Phys. Bio.*, (2010).

AWARDS AND FELLOWSHIPS

2008-2011 Postdoctoral fellowship, Princeton Center for Theoretical Science.
2008-2013 Postdoctoral fellowship, Princeton Council on Science and Technology.
2004-2008 National Science Foundation Graduate Research Fellowship, NSF.
2007 Department Chair's Service Award, UCSB Department of Physics.
2007 Southern California Earthquake Center Research Grant, PI: Jean Carlson.
2006 Boulder School for Condensed Matter Physics, University of Colorado.
2003-2004 National Science Foundation Graduate K-12 Education Fellowship, NSF.
2004-2006 Physics Circus Outreach award, Department of Physics, UCSB.
2002 Barry M. Goldwater Scholarship, University of Virginia.
2002 Elected to Phi Beta Kappa, University of Virginia.
2001 Energy Research Lab. Undergrad. Fellow, Stanford Linear Accelerator.
2001 Elected to Pi Mu Epsilon, University of Virginia.

INVITED
PRESENTATIONS

- 2010 Condensed matter seminar, Yale University (November).
- 2010 Physics colloquium, Emory University (November).
- 2010 Society of Physics students seminar, University of Virginia (September).
- 2010 Condensed matter seminar, University of Virginia (September).
- 2010 Complex systems and biophysics seminar, North Carolina State University (September).
- 2010 Computational chemistry seminar, Duke University (September).
- 2010 MRSEC Chalk Talk, University of Pennsylvania (August).
- 2010 KITP Physics of glasses workshop, Santa Barbara (July).
- 2010 PARDIM10 workshop, MPIPKS Dresden (June).
- 2010 Joint Condensed matter/biophysics seminar, UMass-Amherst (March).
- 2010 Geometry of materials seminar, Institute for Advanced Studies, Princeton University
- 2009 Biophysics seminar, Arizona State University
- 2009 Morphogenesis in plants, animals and beyond workshop, KITP, UC Santa Barbara
- 2009 Condensed matter seminar, University of British Columbia.
- 2009 Granular materials group seminar, Brandeis University.
- 2009 Neurotheory seminar, Columbia University.
- 2009 Physics colloquium, UC Santa Barbara.
- 2008 Soft condensed matter seminar, University of Pennsylvania.
- 2007 Solid earth seminar, Harvard University.
- 2004 Condensed matter seminar, UC Santa Barbara.

CONTRIBUTED
PRESENTATIONS

- 2009 Morphogenesis Workshop, Kavli Institute for Theoretical Physics, Santa Barbara, CA.
- 2009 Soft Active Materials Conference, Syracuse University.
- 2008 American Physical Society March Meeting.
- 2007 American Physical Society Div. Fluid Dynamics Meeting.
- 2007 Southern California Earthquake Center Annual Meeting, Palm Springs, CA.
- 2007 American Physical Society March Meeting.
- 2007 Dynamics Days Conference, Boston, MA.
- 2006 Feedback and Dynamics in Nature Workshop, Grace Hopper Conference, San Diego, CA.
- 2006 Southern California Earthquake Center Annual Meeting, Palm Springs, CA.
- 2005 Earthquakes, Friction and Fracture Conference, Kavli Institute for Theoretical Physics, Santa Barbara, CA.
- 2005 Granular Materials Conference, Kavli Institute for Theoretical Physics, Santa Barbara, CA.

TEACHING
EXPERIENCE**University of California, Santa Barbara**, Santa Barbara, California USA

- 2006** *SIMS Instructor*
Introductory Physics
I designed a curriculum and taught lessons for the Summer Institute in Mathematics and Science(SIMS), which is a two-week introductory physics course targeting entering University freshman from under-represented groups.
- 2005-2006** *Teaching Assistant*
Physics 1 and Physics 3L
I led discussion sections on introductory physics for scientists and engineers. I also modernized the lab instructions weekly Phys. 3L labs, and prepared an extensive written review with student surveys to assess the utility of lab exercises.
- 2003-2004** *Leaps Fellow*
Santa Barbara Junior High School
The Leaps Fellowship program is part of an NSF GK-12 grant to UCSB and places graduate students in 8th and 9th grade science classrooms. I taught lessons, designed curricula and demonstrations, and ran an after school program at Santa Barbara Junior High School. I arranged science nights and after school field trips with the goal of better integrating local science classrooms, UCSB, and the community.

SERVICE

- 2010 Coordinator, Women in Physics, Princeton University.
- 2009-
present Coordinator, Cell and tissue mechanics seminar, Princeton University.
- 2008-
present Referee, Phys. Rev. Letters, Phys. Rev. E, Phys. Rev. B, Physical Biology and Reviews of Modern Physics.
- 2005-2008 Co-chair and Webmaster, Women in Physics Group, UCSB.
- 2006-2008 Co-chair and Webmaster, Graduate Student Life committee, UCSB.
- 2003-2008 Volunteer, Physics Circus, UCSB.
- 2006 Invited Speaker and Chaperon, Conference for Undergraduate Women in Physics, USC.
- 2004, 2005 Judge, Santa Barbara Junior High Science Fair.
- 2004-2006 Graduate Mentor, Women in Science and Engineering, University of California, Santa Barbara.
- 2000-2002 Coordinator, Science Fair Mentoring Program, University of Virginia.
- 1999-2001 Associate Editor and Staff Writer, Cavalier Daily Health and Science Section, University of Virginia.

REFERENCES

Dr. Andrea Liu
Edmund J. and Louise W. Kahn Term Professor
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Dr. Timothy Newman
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Dr. John Doyle
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Dr. Mikko Haataja
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