

## M. Lisa Manning

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RESEARCH INTERESTS	Modeling and analysis of deformation and flow in fluids, amorphous solids, and biological tissues using theory, numerical methods, and simulation.	
PUBLICATIONS	<p>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," <i>accepted to Phys. Rev. E</i>, <i>online:arXiv.org 0808.0529</i>, (2009).</p> <p>M. L. Manning, "Effective temperature and strain localization in amorphous solids," <i>Dissertation, University of California Santa Barbara</i>, (2008).</p> <p>E. G. Daub, M. L. Manning and J. M. Carlson, "Shear strain localization in elastodynamic rupture simulations," <i>Geophysical Research Letters</i> <b>35</b>, L12310, (2008).</p> <p>J. S. Langer and M. L. Manning, "Steady-state, effective-temperature dynamics in a glassy material," <i>Phys. Rev. E</i> <b>76</b>, 056107, (2007).</p> <p>M. L. Manning, J. S. Langer and J. M. Carlson, "Strain localization in a shear transformation zone model for amorphous solids," <i>Phys. Rev. E</i> <b>76</b>, 056106, (2007).</p> <p>M. Manning, J. M. Carlson and J. Doyle, "Highly Optimized Tolerance in dense and sparse resource regimes," <i>Phys. Rev. E</i> <b>72</b>, 016108, (2005).</p>	
PREPRINTS	<p>M. Lisa Manning, B. Bamieh, and J. M. Carlson, "Descriptor approach for eliminating spurious eigenvalues in hydrodynamic equations," <i>submitted to SIAM Sci. Comp.</i>, <i>online:arXiv.org 0705.1542</i>, (2009).</p> <p>E. G. Daub, M. L. Manning and J. M. Carlson, "Pulse-like, crack-like and supershear earthquake ruptures with shear strain localization," <i>submitted to J. Geophys. Res.</i>, (2009).</p>	
AWARDS AND FELLOWSHIPS	<p><b>2008-2011</b> Postdoctoral fellowship, Princeton Center for Theoretical Science.</p> <p><b>2008-2013</b> Postdoctoral fellowship, Princeton Council on Science and Technology.</p> <p><b>2004-2008</b> National Science Foundation Graduate Research Fellowship, NSF.</p> <p><b>2007</b> Department Chair's Service Award, UCSB Department of Physics.</p> <p><b>2007</b> Southern California Earthquake Center Research Grant, PI: Jean Carlson.</p> <p><b>2006</b> Boulder School for Condensed Matter Physics, University of Colorado.</p> <p><b>2003-2004</b> National Science Foundation Graduate K-12 Education Fellowship, NSF.</p> <p><b>2004-2006</b> Physics Circus Outreach award, Department of Physics, UCSB.</p> <p><b>2002</b> Barry M. Goldwater Scholarship, University of Virginia.</p> <p><b>2002</b> Elected to Phi Beta Kappa, University of Virginia.</p> <p><b>2001</b> Energy Research Lab. Undergrad. Fellow, Stanford Linear Accelerator.</p> <p><b>2001</b> Elected to Pi Mu Epsilon, University of Virginia.</p>	

INVITED  
PRESENTATIONS

- 2009 Deformation and failure in disordered solids, Physics colloquium, UCSB.
- 2008 Rate-dependent shear banding in amorphous solids, Soft condensed matter seminar, University of Pennsylvania.
- 2007 Effective temperature and strain localization in amorphous solids, Solid earth seminar, Harvard University.
- 2004 Optimization-based models for complex systems, Condensed matter seminar, UCSB.

CONTRIBUTED  
PRESENTATIONS

- 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.

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, Mikko Haataja, Joerg Rottler, Andrea Liu  
 Projects: Modeling of deformation and flow in developing zebrafish embryos  
 — Aging in an STZ model for amorphous solids — Comparing soft modes and non-affine deformation under shear in amorphous solids

**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: Rate-dependent shear banding and material failure in amorphous solids — transient instabilities in constitutive laws for amorphous solids — 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

TEACHING  
EXPERIENCE

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

**2006**            *SIMS Instructor*  
Introductory Physics  
The Summer Institute in Mathematics and Science(SIMS) is an NSF-funded program targeting entering University freshman who are from under-represented groups. I designed a curriculum and taught lessons for this intensive, two-week introductory physics course. Throughout the year I held mentoring and review sessions for the students.

**2005-2006**    *Teaching Assistant*  
Physics 1 and Physics 3L  
I led weekly discussion sections for Physics 1, an introductory physics class for scientists and engineers, during which I worked example problems and answered student questions. For Phys 3L, I led weekly laboratory sessions and graded lab reports. I re-wrote and modernized lab instructions for several projects and prepared an extensive written review with student surveys to help the course instructor assess the utility of laboratory 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. As a Leaps fellow I taught lessons, designed curricula and demonstrations, and ran an after school program at Santa Barbara Junior High School. I also helped to arrange Family Science nights and after school field trips with the goal of better integrating local science classrooms, UCSB, and the community.

OUTREACH

- 2006-2007 Physics Instructor and Mentor, Summer Institute in Mathematics and Science (SIMS), UCSB.
- 2005-2008 Co-chair and Webmaster, Women in Physics Group, UCSB.
- 2007 Organizer and volunteer, Introductory Physics for Physics Majors tutoring sessions.
- 2004-2008 Coffee Hour Coordinator and Planning Committee Member, Women in Science and Engineering, 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.
- 2000 Volunteer, Madison House Migrant Aid, University of Virginia.

REFERENCES

Dr. Jean Carlson  
 Professor  
 Department of Physics  
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Dr. James Langer  
 Professor Emeritus  
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Dr. Bassam Bamieh  
 Professor  
 Department of Mechanical Engineering  
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Dr. John Doyle  
 Professor  
 Department of Control and Dynamical Systems  
 California Institute of Technology  
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