M. Lisa Manning

Contact Information

Broida Hall 6014
Department of Physics
University of California
Santa Barbara, CA 93106-9530 USA

Voice: (805) 893-4544,(805) 403-0808
Fax: (805) 893-8345
E-mail: mmanning@physics.ucsb.edu
Web: www.physics.ucsb.edu/~mmanning

Research Interests

I study mechanisms for deformation and failure in amorphous materials, friction laws for material interfaces, and transient growth of fluid modes in transition to turbulence. These are examples of dynamical systems with many degrees of freedom and hetergenous behavior that can be modeled and analyzed using continuum equations. My research has focused on strain localization in a shear transformation zone (STZ) model for amorphous solids, the generalized stability of a fluid flowing past a flexible membrane, and numerical methods for solving hydrodynamic eigenvalue problems.

Education

University of California, Santa Barbara, California, USA

Adviser: Jean M. Carlson

Ph.D. Candidate, Dept. of Physics (*expected graduation date*: June 2008)

M.A., Physics, May 2005

University of Virginia, Charlottesville, Virginia USA

B.S., Physics, *with highest distinction*, 2002

B.A., Mathematics, 2002

Research Experience

University of California, Santa Barbara, Dept. of Physics, Santa Barbara, California USA

Graduate Research Assistant — **2003-present**
Adviser: Dr. Jean M. Carlson — Materials and Soft Condensed Matter Physics
Thesis committee members: Dr. James S. Langer, Dr. Bassam Bamieh

University of Virginia, Dept. of Physics, Charlottesville, Virginia USA

Undergraduate Research Assistant — **1999-2002**
Adviser: Dr. Brad Cox — KTeV fixed target experiment, Fermilab

Energy Research Undergraduate Laboratory Fellow — **Summer 2001**
Adviser: Dr. Michael Kelsey — Restoring BaBar prototype drift chamber

Publications

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

M. L. Manning, J. S. Langer, J. M. Carlson, "Strain localization in a shear transformation zone model for amorphous solids", *to appear in Phys. Rev. E* , ArXiv 0706.1078 (2007)

M. Lisa Manning, B. Bamieh, J.M. Carlson, "Eliminating spurious eigenvalues in the analysis of incompressible fluids and other systems of differential-algebraic equations", *submitted to J. Comp. Phys.* , ArXiV 0705.1542 (2007)

J. S. Langer and M. L. Manning, "Steady-state, effective-temperature dynamics in a glassy material", *to be submitted to Phys. Rev. E* , ArXiv 0709.3329 (2007)

Conference Presentations

Contributed Talk, Transient growth in channel flow past a flexible wall, APS Div. Fluid Dynamics Meeting, November 2007.

Poster, Southern California Earthquake Center Annual Meeting, Palm Springs, CA. September 2007.

Contributed Talk, Localization in amorphous solids, APS March Meeting 2007.

Poster, Dynamics Days, Boston, MA. January 2007.

Poster, Feedback and Dynamics in Nature Workshop, Grace Hopper Conference, San Diego, CA. October 2006.

Poster, Southern California Earthquake Center Annual Meeting, Palm Springs, CA. September 2006.

Poster, Earthquakes, Friction and Fracture Conference, Kavli Institute for Theoretical Physics, Santa Barbara, CA. August 2005.

Poster, Granular Materials Conference, Kavli Institute for Theoretical Physics, Santa Barbara, CA. June 2005.

Contributed Talk, Engineering tools in physics: Using input/output analysis to study complex systems, Condensed matter reading group seminar, UCSB. May 2005.

Invited Talk, Optimization-based models for complex systems, Condensed Matter Seminar, UCSB. November 2004.

Honors and Awards

National Science Foundation Graduate Research Fellowship, 2004-present.
National Science Foundation.

Department Chair's Certificate of Appreciation, 2007.
UCSB Department of Physics.

Southern California Earthquake Center Research Grant, 2007.
PI: Jean Carlson.

Boulder School for Condensed Matter Physics attendee, 2006.
University of Colorado, Boulder.

National Science Foundation Graduate K-12 Education Fellowship, 2003-2004.
National Science Foundation.

Physics Circus Outreach award, 2004, 2005, 2006.
Department of Physics, University of California, Santa Barbara.

Barry M. Goldwater Scholarship, 2002.
University of Virginia.

Elected to Phi Beta Kappa, 2002.
University of Virginia.

Elected to Pi Mu Epsilon, 2001.
University of Virginia.

Professional Activities

Condensed Matter Reading Group, Department of Physics, University of California, Santa Barbara, 2004-2006.

American Physical Society, Member, 2005-present.

Teaching Experience

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

SIMS Instructor **Summer 2006**

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. As the SIMS Physics Instructor, I designed a curriculum and taught lessons for an intensive, introductory two-week course on University Physics. I worked to borrow textbooks for the duration of the program, tutored students, and designed a group activity relating the curriculum topics to current research in granular materials. Throughout the year I hold mentoring and review sessions for the students.

Teaching Assistant **2005-2006**

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. I held regular office hours and assisted the course instructor in grading homework and exams. Led weekly laboratory sessions for Physics 3L, an introductory lab and graded lab reports. Re-wrote lab instructions for several sessions to bring them up to date with current equipment and prepared an extensive written review with student surveys to help the course instructor assess the utility of laboratory exercises.

Leaps Fellow **2003-2004**

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

Physics Instructor and Mentor, Summer Institute in Mathematics and Science (SIMS), UCSB, 2006-present.

Co-chair and Webmaster, Women in Physics Group, UCSB, 2005-present.

Organizer and volunteer, Introductory Physics for Physics Majors tutoring sessions, 2007.

Coffee Hour Coordinator and Planning Committee Member, Women in Science and Engineering, UCSB, 2004-present.

Co-chair and Webmaster, Graduate Student Life committee, UCSB, 2006-present.

Volunteer, Physics Circus, UCSB. 2003-present.

Invited Speaker and Chaperon, Conference for Undergraduate Women in Physics, USC, 2006.

Judge, Santa Barbara Junior High Science Fair, 2004, 2005.

Graduate Mentor, Women in Science and Engineering, University of California, Santa Barbara, 2004-2006.

Coordinator, Science Fair Mentoring Program, University of Virginia, 2000-2002.

Associate Editor and Staff Writer, Cavalier Daily Health and Science Section, University of Virginia, 1999-2001.

Volunteer, Madison House Migrant Aid, University of Virginia, 2000.

References

Prof. Jean Carlson
Department of Physics
University of California Santa Barbara
Santa Barbara, CA, 93106
carlson@physics.ucsb.edu

Prof. James Langer
Department of Physics
University of California Santa Barbara
Santa Barbara, CA, 93106
langer@physics.ucsb.edu

Prof. Bassam Bamieh
Department of Engineering
University of California Santa Barbara
Santa Barbara, CA, 93106
bamieh@engineering.ucsb.edu

Prof. John Doyle
Department of Control and Dynamical Systems
California Institute of Technology
Pasadena, CA, 91125
doyle@cds.caltech.edu