Ellen R. Peterson

Carnegie Mellon University
Department of Mathematical Sciences
Center for Nonlinear Analysis
Wean Hall 6113
Pittsburgh, PA 15213
office: 412-268-2162
cell: 567-204-0334

ellenp@andrew.cmu.edu
http://www.math.cmu.edu/∼ellenp/

EDUCATION ◇ **North Carolina State University**, Raleigh, NC

· Ph.D. in Applied Mathematics, August 2010
Dissertation: *Flow of Thin Liquid Films with Surfactant: Analysis, Numerics, and Experiment*
Advisor: Michael Shearer

· M.S. in Applied Mathematics, May 2009

◇ **Wittenberg University**, Springfield, OH

· B.S. in Mathematics (with Departmental Honors), summa cum laude, May 2006

RESEARCH INTERESTS Partial differential equations, numerical analysis, modeling, thin liquid films

EXPERIENCE ◇ **NSF-RTG Postdoctoral Associate**, Carnegie Mellon University, Center for Nonlinear Analysis, Fall 2010-present

◇ **Graduate Research Assistant**, North Carolina State University, Department of Mathematics, 2007 -2010
Advisor: Michael Shearer

◇ **Preparing the Professoriate Fellow**, North Carolina State University, 2009-2010
-MA 225, instructor, Spring 2010
-MA 225 (Foundations of Mathematics), observed, assisted and substitute taught, Fall 2009

◇ **Graduate Teaching Assistant**, North Carolina State University, Fall 2006
-MA 111 recitation sections, substitute taught, Fall 2006

GRANTS Senior Investigator on NIH Grant - *Improving Inhaled Drug Delivery with Self-Dispersing Liquids* with T. Corcoran, S. Garoff, T. Przybycien, R. Tilton, submitted

Senior Investigator on NSF Grant - *Surfactant Induced Post-Deposition Transport on Aerosols with Application to Pulmonary Drug Delivery* with T. Corcoran, S. Garoff, T. Przybycien, R. Tilton, in preparation

PUBLICATIONS R. Kalita, R. Sharma, S. Garoff, E.R. Peterson, *Autophobicity on Liquid Substrates*, in preparation.

E. R. Peterson, A. LeBouil, M. Shearer, K. Daniels, *Spreading of thin fluid films driven by surfactant: modeling and experiments*, in preparation.

E. R. Peterson, M. Shearer, *Simulations of spreading surfactant on a thin liquid film*, submitted.

R.T. Cerbus, S. Garoff, W.I. Goldburg, E.R. Peterson, *Local Heating at Convection Fronts and Moving Contact Lines on Hygroscopic Fluids*, submitted.

E. R. Peterson, M. Shearer, *Radial Spreading of Surfactant on a Thin Liquid Film*, Appl. Math. Res. Express, 2010, doi:10.1093/amrx/abq015.

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E. Peterson, M. Shearer, T. Witelski, R. Levy, *Stability of Traveling Waves in Thin Liquid Films Driven by Gravity and Surfactant*, Proceedings of Symposia in Applied Mathematics, Vol 67, No 2, 855-868, 2009.

A. Deines, E. Peterson, D. Boeckner, J. Boyle, A. Keighley, J. Kogut, J. Lubben, R. Rebarber, R. Ryan, B. Tenhumberg, S. Townley, A.J. Tyre, *Robust Population Management Under Uncertainty for Strucutured Population Models*, Ecological Applications, Vol 12, No. 8, 2175-2183, 2007.

TALKS/ POSTERS	◇ American Physical Society Division of Fluid Dynamics (APS-DFD), Baltimore, MD, *Autophobing on a Liquid Substrate*, November 2011

◇ American Physical Society Division of Fluid Dynamics (APS-DFD), Baltimore, MD, *Autophobing on a Liquid Substrate*, November 2011

◇ International Congress on Industrial and Applied Mathematics (ICIAM), Vancouver, BC, *Spreading Droplets on Thin Fluid Films*, July 2011

◇ Thin Films Day, North Carolina State University, *Behavior of a Droplet of Fluid on a Thin Liquid Film*, June 2011

◇ AMS Eastern Sectional Meeting, Worcester, MA, *Behavior of a Droplet of Fluid on a Thin Liquid Film*, April 2011

◇ Center for Nonlinear Analysis Seminar, Carnegie Mellon University, *Flow of Thin Liquid Films with Surfactant: Analysis, Numerics, and Experiment*, September 2010

◇ Thin Films Day, North Carolina State University, *Spreading Surfactant on a Thin Liquid Layer*, April 2010

◇ Joint Math Meetings, San Francisco, CA, *Spreading Surfactant on a Thin Liquid Layer*, January 2010

◇ American Physical Society Division of Fluid Dynamics (APS-DFD), Minneapolis, MN, *Surfactant Spreading on a Thin Liquid Layer: Modeling and Theory*, November 2009

◇ SIAM Annual Meeting, Denver, CO, *Insoluble Surfactant Spreading on a Horizontal Thin Liquid Film*, July 2009

◇ Triangle Soft Matter Workshop, North Carolina State University, *Thin Fluid Films with Surfactant*, poster and soundbite, May 2009

◇ SAS Hall Dedication, North Carolina State University, *Thin Fluid Films with Surfactant*, poster, May 2009

◇ Higher Order Geometric Evolution Equations: Theory and Applications from Microfluidics to Image Understanding, IMA-University of Minnesota, *Thin Fluid Films with Surfactant*, poster, March 2009

◇ North Carolina State Graduate Recruitment Day, *Shock Waves: Flow of Thin Liquid Films*, February 2009, February 2010

◇ Thin Films Day, North Carolina State University, *Flow of Thin Films with Surfactant: Behavior of Perturbations*, January 2009

◇ EDGE Cluster Meeting, North Carolina State University, *Flow of Thin Films with Surfactant: Beginning Stability Analysis*, October 2008

◇ Applied Mathematics Graduate Student Seminar, North Carolina State University, current research talks, spring 2007, fall 2007, fall 2008, spring 2009, fall 2009

◇ National Conference of Undergraduate Research, UNC-Asheville, *Mathematical Modeling and Control of the Peregrine Falcon Population*, April 2006

◇ Joint Mathematics Meeting, San Antonio, TX *Robustness Applied to Harvesting the Peregrine Falcon Population*, poster, January 2006

◇ Undergraduate Mathematics Day, University of Dayton, *Falcon Harvesting: Robustness and Transients Applied to Falcon Harvesting*, November 2005

◇ Wittenberg University Student Research Symposium, Wittenberg University *Robustness Applied to Harvesting the Peregrine Falcon Population*, poster, October 2005

◇ Mathematical Association of America Central Section Conference, Lincoln, NE *Falcon Harvesting: Robustness and Transients Applied to Falcon Harvesting*, October 2005

CONFERENCES/ PROGRAMS

Promoting Diversity at the Graduate Level in Mathematics: a National Forum, MSRI, October 2008

MBI Summer Graduate Program: Patterns of multiallelic polymorphism maintained by migration and selection, The Ohio State University, summer 2006

Enhancing Diversity in Graduate Education (EDGE), New College of Florida, June 2006

NSF-REU Control Theory Techniques Applied to Biological Population Problems, University of Nebraska-Lincoln, summer 2005

RESEARCH AWARDS

◇ 7th International Congress on Industrial and Applied Mathematics (ICIAM) Travel Award, July 2011
◇ Joint Mathematics Meetings Graduate Student Travel Grant, January 2010
◇ SIAM Student Chapter Representative, NCSU, SIAM Annual Meeting, July 2009
◇ NSF-RTG in Mathematics of Materials, Research Assistantship, January 2008-July 2010
◇ Phi Beta Kappa National Honor Society, Inducted April 2006

COURSES TAUGHT

21-355 (CMU) Real Analysis 1, Fall 2011

21-369 (CMU) Numerical Methods, Spring 2011

21-366B (CMU) Topics in Applied Mathematics: Analysis of Thin Fluid Films, Fall 2010

MA 225 (NCSU) Foundations of Advanced Mathematics, Spring 2010

MA 111(NCSU) Precalculus Algebra and Trigonometry, Teaching Assistant - led recitations sections, substitute taught, Fall 2006

TEACHING DEVELOPMENT

◇ Faculty Workshops on Teaching and Learning, CMU Eberly Center
- New Faculty Workshop, August 2010
- How do students develop mastery?, January 2011
- Why do students develop and course climate matter for student learning?, March 2011

◇ Preparing the Professoriate Fellow, North Carolina State University, August 2009-May 2010

SERVICE

Supervised Eli Fatsi, Carnegie Mellon summer research student, summer 2011

ICAIM minisymposium co-organizer, *The Dynamics of Thin Liquid Films*, July 2011

Enhancing Diversity in Graduate Education (EDGE), June 2011, *Invited Speaker*

Volunteer speaker at Carnegie Mellon Undergraduate Mathematics Seminar, March 2011

Optimizing Interviews at the Joint Math Meeting, Research Training Modules, North Carolina State University, January 2010, *Panelist*

Enhancing Diversity in Graduate Education (EDGE) Reunion, Pomona College, June 2008, *Panelist*