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EDUCATION

University of North Carolina at Chapel Hill – Chapel Hill, NC

- *Ph.D., Mathematics* – August 2008
 - Focus in Applied Mathematics.
 - Dissertation: “Regularized Singularities and Spectral Deferred Correction Methods: A Mathematical Study of Numerically Modeling Stokes Fluid Flow.”
 - Research Advisor: Michael L. Minion.
- *Certificate in Biomedical Translational Research* – May 2006
 - Earned through the program “Major Challenges of Clinical Medicine: An Overview for Basic Scientists,” a part of the UNC Roadmap Initiative funded by the National Institutes of Health encouraging interdisciplinary translational medical research.

Dickinson College – Carlisle, PA

- *B.S., Mathematics, Summa Cum Laude with Departmental Honors* – May 2003
 - Honors Thesis: “A Link Between Mathematics and Physics: A Study of Knot Theory and Magnetic Field Line Reconnection.”
 - Research Advisor: David Richeson.
- *B.S., Physics, Summa Cum Laude* – May 2003
 - Thesis: “Helicity Conservation Under Reidemeister Moves.”
 - Research Advisor: Hans Pfister.

TEACHING EXPERIENCE & ACADEMIC EMPLOYMENT

Duke University – Durham, NC

- Assistant Research Professor – August 2008 to Present
 - Conducted research modeling the hydrodynamics of immersed slender fibers as a member of the Mathematical Biology Group in the Department of Mathematics.
 - PRUV Mentor – May 2010 to Present
 - ◇ PRUV: Program for Research for Undergraduates with Vigor (previously ‘with VIGRE’).
 - ◇ Supervised an undergraduate student working on his senior thesis modeling the mechanics of running.
 - ◇ Guided academic inquiry related to senior research project, enhanced student’s verbal and written communication skills, discussed and encouraged career and graduate school plans with student.

- Taught mathematics courses at both the undergraduate and graduate level.
- Designed syllabus and course policies, prepared and presented clear and engaging lesson plans, authored tests and quizzes, assigned course grades, consulted with students during office hours and on an individual basis.
- Courses include:
 - ◊ Mathematical Numerical Analysis (undergraduate seminar) – Spring 2011
 - ◊ Elementary Differential Equations – Fall 2010
 - ◊ Research Independent Study: Modeling the Mechanics of Running – Fall 2010
 - ◊ Scientific Computation II (graduate level) – Spring 2010
 - ◊ Intermediate Calculus (multivariable) – Fall 2009 and Fall 2008
 - ◊ Linear Algebra and Applications – Spring 2009
 - ◊ Independent Study: Fluid Dynamics of the Human Eye – Spring 2009

University of North Carolina at Chapel Hill – Chapel Hill, NC

- Research Assistant – August 2005 to August 2008
 - Supported by National Science Foundation Research Training Group Grant.
 - Collaborated with undergraduate and graduate students, postdoctoral fellows, and faculty from various departments in laboratory and classroom settings on fluid dynamics research projects.
- Research Assistant – January 2005 to July 2005
- Primary Instructor/Teaching Associate
 - Wrote syllabus, prepared and presented lesson plans, authored tests and quizzes, assigned course grades, consulted with students during office hours.
 - Courses taught:
 - ◊ Linear Algebra for Applications – Summer 2008
 - ◊ Pre-Calculus Mathematics – Fall 2004
 - ◊ Trigonometry and Analytic Geometry – Spring 2004
- Tutor – Summer 2004
 - Worked with students in the Math Help Center, which provides a central location for undergraduate students to come for individual mathematics tutoring.

Private tutoring – Chapel Hill, NC

- High school topics tutored: algebra, geometry, pre-calculus/trigonometry, calculus, physics.
- College topics tutored: college algebra, pre-calculus/trigonometry, calculus, business calculus, multivariable calculus, differential equations, discrete mathematics, linear algebra, analysis.
- Fall 2004 to Spring 2008.

Dickinson College Teaching Assistant – Carlisle, PA

- Assisted professors in demonstrations and lectures as well as helped students with computer and lab activities in workshop-style physics, calculus, and statistic courses, which incorporate hands-on lab time into classroom lectures – August 2000 to May 2003.

- Recipient of the Dickinson College Department of Physics & Astronomy Excellence in Teaching Award – May 2002.
- Provided constructive criticism and grades on writing assignments in upper-level writing-intensive physics course – August 2001 to December 2001.

National Science Foundation – Arlington, VA

- Science Resources Statistics Division Intern in conjunction with the Joint Program in Survey Methodology at the University of Maryland – Summer 2001.
- Designed and executed a statistical study of the characteristics of ‘double doctorates,’ people who have earned two research doctorates in the sciences, compared to those who have earned one research doctorate.

RESEARCH PUBLICATIONS

- “Modeling a Semi-Flexible Filament in Cellular Stokes Flow Using Regularized Stokeslets.” E.L. Bouzarth, A.T. Layton, and Y.-N. Young. Submitted for publication, 2010.
- “Modeling Non-Slender Bodies with the Method of Regularized Stokeslets.” E.L. Bouzarth and M.L. Minion. Submitted for publication, 2010.
- “Modeling Slender Bodies with the Method of Regularized Stokeslets.” E.L. Bouzarth and M.L. Minion. Submitted for publication, 2010.
- “A Multirate Time Integrator for Regularized Stokeslets.” E.L. Bouzarth and M.L. Minion. *Journal of Computational Physics*, 229 (11), June 2010, 4208-4224.
- “Epicyclic Orbits in a Viscous Fluid about a Precessing Rod: Theory and Experiments at the Micro and Macro Scales.” E.L. Bouzarth, A. Brooks, R. Camassa, H. Jing, T.J. Leiterman, R.M. McLaughlin, R. Superfine, J. Toledo, and L. Vicci. *Physical Review E*, 76, 016313, 2007.
- “Helicity Conservation Under Reidemeister Moves.” E.L. Bouzarth and H. Pfister. *American Journal of Physics*, 74 (2), February 2006, 141-144.
- “Topological Helicity for Framed Links.” E.L. Bouzarth and D. Richeson. *Journal of Knot Theory and its Ramifications*, 13 (8), 2004, 1007-1019.

RESEARCH PRESENTATIONS

- “Using Regularized Stokeslets to Model Inextensible Fibers in Cellular Stokes Flow,” *Workshop on Fluid Motion Driven by Immersed Structures*, Fields Institute, Toronto, Canada, August 2010.
- “A Multi-explicit Spectral Deferred Correction Method Applied to Regularized Stokeslets,” *SIAM Annual Meeting*, Pittsburgh, PA, July 2010.
- “Modeling Immersed Biological Fibers and Fluids with Regularized Stokeslets,” *Frontiers in Applied and Computational Mathematics*, New Jersey Institute of Technology, Newark, NJ, May 2010.
- “Modeling Slender Biological Objects with Regularized Stokeslets,” *SIAM Southeastern-Atlantic Sectional Meeting*, North Carolina State University, Raleigh, NC, March 2010.

- “A Multi-Explicit Spectral Deferred Correction Method Applied to Regularized Stokeslets,” *AMS Southeastern Sectional Meeting*, North Carolina State University, Raleigh, NC, April 2009.
- “Modeling Biologically Inspired Fluid Flow Using Regularized Singularities and Spectral Deferred Correction Methods,” *Applied Mathematics and Analysis Seminar*, Duke University, Durham, NC, October 2008.
- “Modeling Biologically Inspired Fluid Flow Using Regularized Singularities and Spectral Deferred Correction Methods,” *Mathematics Seminar*, Virginia Commonwealth University, Richmond, VA, February 2008.
- “Modeling Biologically Inspired Fluid Flow Using Regularized Singularities and Spectral Deferred Correction Methods,” *Mathematical Biology Seminar*, University of Utah, Salt Lake City, UT, February 2008.
- “Modeling Biologically Inspired Fluid Flow Using Regularized Singularities and Spectral Deferred Correction Methods,” *Applied Mathematics Colloquium*, Northwestern University, Evanston, IL, January 2008.
- “An Introduction to Modeling Biologically Motivated Fluid Flow,” *Sigma Pi Sigma Induction Ceremony Keynote Address*, Dickinson College, Carlisle, PA, November 2007.
- “Modeling Biologically Inspired Fluid Flow Using Regularized Singularities and Spectral Deferred Correction Methods,” *South Eastern Atlantic Mathematical Sciences Workshop*, National Institute of Aerospace, Hampton, VA, October 2007.
- “Using Regularized Stokeslets to Model Fluid Flow Generated by a Spinning Rod,” *Graduate Mathematics Association Seminar*, University of North Carolina at Chapel Hill, Chapel Hill, NC, October 2005.
- “A Link Between Mathematics and Physics: A Study of Knot Theory and Magnetic Field Line Reconnection,” *Math/CS Colloquium Series*, Dickinson College, Carlisle, PA, April 2003.

RESEARCH POSTER PRESENTATIONS

- “Using Regularized Stokeslets to Model Inextensible Fibers in Stokes Flow,” *Fluid Dynamics, Analysis, and Numerics*, Duke University, Durham, NC, June 2010.
- “Using Regularized Singularities and Spectral Deferred Correction Methods to Model Fluid Flow Generated by a Precessing Rod,” *Association for Women in Mathematics Workshop for Women Graduate Students and Recent PhDs*, Joint Mathematics Meetings, San Diego, CA, January 2008.
- “Implementing Regularized Stokeslets to Model Biologically Motivated Fluid Flow,” *Workshop for Young Researchers in Mathematical Biology*, Mathematical Biosciences Institute, The Ohio State University, Columbus, OH, September 2007.
- “Implementation of Regularized Stokeslets to Model Fluid Flow Generated by a Spinning Rod,” *University Research Day*, University of North Carolina at Chapel Hill, Chapel Hill, NC, March 2007.
- “Implementation of Regularized Stokeslets to Model Fluid Flow Generated by a Spinning Rod,” *South Eastern Atlantic Mathematical Sciences Workshop*, College of Charleston, Charleston, SC, September 2006.

- “Implementation of Regularized Stokeslets to Model Fluid Flow Generated by a Spinning Rod,” *South Eastern Atlantic Mathematical Sciences Workshop*, University of North Carolina at Chapel Hill, Chapel Hill, NC, September 2005.

ADDITIONAL CONFERENCES ATTENDED

- *Career Mentoring Workshop for Women Finishing Their PhDs in the Mathematical Sciences*, United States Military Academy, West Point, NY, August 2007.
- *SIAM Annual Meeting*, New Orleans, LA, July 2005.
- *Microorganism Motility Workshop*, Tulane University, New Orleans, LA, May 2005.
- *Multiscale Processes in Fusion Plasmas Workshop*, Institute for Pure and Applied Mathematics, University of California, Los Angeles, Los Angeles, CA, January 2005.
- *Summer Mathematics Institute in Minimal Surface Theory*, Brigham Young University, Provo, UT, June 2002.

ACADEMIC & PROFESSIONAL SERVICE

- Active Founding Member, Noetherian Ring (an organization founded in January 2010 supporting women in all levels of mathematics), Duke University, January 2010 to Present.
- Organizer, Special Session on “Deferred Correction Methods and Their Applications” at AMS Southeastern Sectional Meeting, North Carolina State University, Raleigh, NC, April 2009.
- Faculty Volunteer and Activity Leader, Duke University FEMMES Program (Females Excelling More in Math, Engineering, and Science – a program that engages elementary school girls in hands-on science and math activities), February 2009 to Present.
- Faculty Advisor, Duke University undergraduate team competing in the Mathematics Contest in Modeling, February 2009 to Present.
- Coordinator, Duke University Applied Mathematics and Analysis Seminar, August 2008 to Present.
- Treasurer, Graduate Mathematics Association, University of North Carolina at Chapel Hill, Fall 2004 to May 2007.
- President, Society of Physics Students, Dickinson College Chapter, Fall 2002 to Spring 2003.
- Coordinator, Carlisle Tutoring Program, Dickinson College, Spring 2000 to Spring 2003.

PROFESSIONAL SOCIETIES

- Association for Women in Mathematics
- Society for Industrial and Applied Mathematics
- American Mathematical Society

ACADEMIC HONOR SOCIETIES

- Phi Beta Kappa, Undergraduate honor society
- Pi Mu Epsilon, Mathematics honor society
- Sigma Pi Sigma, Physics honor society
- Omicron Delta Kappa, Leadership honor society
- Alpha Lambda Delta, Honor society for first year undergraduates

ACADEMIC HONORS

- Chad Ivan Knight Graduate Fellowship
- Dean's List, Dickinson College
- Lance E. Kohlhaas Memorial Prize in Mathematics, Dickinson College
- Caroline Hatton Clark Mathematics Prize, Dickinson College
- Henry P. Cannon Memorial Prize in Mathematics, Dickinson College
- William W. Landis Memorial Prize in Mathematics, Dickinson College
- Richard M. Sia Memorial Prize in Physics, Dickinson College
- Landis-Mohler Prize in Physics, Dickinson College
- Lloyd W. Hughes Scholar-Athlete Award, Dickinson College
- Intercollegiate Tennis Association Scholar Athlete