

Patrick Plunkett

Curriculum Vitae

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University of California, Santa Barbara
Department of Mathematics

Education

- *Ph.D. Mathematics* University of California, Santa Barbara
Advisor: Paul Atzberger (anticipated June 2013) Santa Barbara, CA
- *M.A. Mathematics* University of California, Santa Barbara
2009 Santa Barbara, CA
- *B.S. Summa Cum Laude Mathematics and Computer Science* Duquesne University
2007 Pittsburgh, PA

Research Experience

- *Spatially Adaptive Stochastic Multigrid Methods for Fluctuating Hydrodynamics*
Advisor: Dr. Paul Atzberger UCSB Department of Mathematics
August 2011 - Present Santa Barbara, CA
- *Consulting Researcher - Manuscript Preparation*
Advisors: Dr. Michael Freedman & Sean Fraer Microsoft Station Q (UCSB)
June 2011 - Present Santa Barbara, CA
- *Numerical Approximation of Supported Lipid Bilayer Formation*
Advisors: Dr. Paul Atzberger & Dr. Deborah Fygenson UCSB Department of Mathematics
August 2010 - Present Santa Barbara, CA
- *Point Vortex System Analysis (REU)*
Advisor: Dr. Gustavo Ponce UCSB Department of Mathematics
August 2007 - September 2007 Santa Barbara, CA
- *Genetic Sequence Analysis and Phylogenetics*
Advisor: Dr. Don Simon Duquesne University Department of Computer Science
August 2006 - May 2007 Pittsburgh, PA
- *Supercomputing Productivity Study*
May 2005 Pittsburgh Supercomputing Center
Pittsburgh, PA
- *Physical Knot Theory*
Advisor: Dr. Eric Rawdon Duquesne University Department of Mathematics
August 2004 - August 2006 Pittsburgh, PA

Technical Experience

- *Programming languages with which I am proficient:*
C++ — C — Python — MatLab — Octave

- *Programming languages with which I am familiar:*
Java — Javascript — Perl — MPI
- *Other proficiencies:*
Eclipse IDE — SVN version control — Emacs — L^AT_EX — HTML/CSS — Inkscape — gnuplot —
POV-Ray — ParaView — awk — bash — Regular Expressions — WeBWork

Teaching Experience

- *Classes which I have taught:*
Introduction to Numerical Analysis
Vector Calculus
- *Classes for which I have been a teaching assistant:*
Calculus for Social Science Majors
Calculus with Applications
Linear Algebra and Differential Equations
Introduction to Numerical Analysis
Transition to Higher Mathematics

Awards

- *Department of Mathematics Graduate Student Teaching Award* UCSB
In recognition of outstanding achievement as a Teaching Assistant in Mathematics June 2012
- *Department of Mathematics Graduate Student Research Fellowship* UCSB
May 2011
- *Department of Mathematics Graduate Student Research Fellowship* UCSB
February 2010

Publications

- *Spatially Adaptive Stochastic Multigrid Methods for Fluctuating Hydrodynamics*
Pat Plunkett and Paul Atzberger
In preparation (available online).
- *Simulation of Edge Facilitated Deposition and Critical Concentration Induced Rupture of Vesicle Deposition of Supported Lipid Bilayer Membranes*
Pat Plunkett, Brian Camley, Kim Weirich, Jacob Israelachvili, Deborah Fygenson, and Paul Atzberger
In preparation (available online).
- *Shapes of Knotted Cyclic Polymers*
Eric J. Rawdon, John C. Kern, Michael Piatek, Patrick Plunkett, Andrzej Stasiak and Kenneth C. Millett
Bussei Kenkyu, 92, 1, 32-37, April 2009.
- *Effect of Knotting on Polymer Shapes and Their Enveloping Ellipsoids*
Kenneth C. Millett, Patrick Plunkett, Michael Piatek, Eric J. Rawdon, and Andrzej Stasiak
The Journal of Chemical Physics, 130, 165104, 2009.

- *Effect of Knotting on the Shape of Polymers*
Eric J. Rawdon, John C. Kern, Michael Piatek, Patrick Plunkett, Andrzej Stasiak and Kenneth C. Millett
Macromolecules, 41, 21, 8281-8287, 2008.
- *Scaling Behavior and Equilibrium Lengths of Knotted Polymers*
Eric Rawdon, Akos Dobay, John C. Kern, Kenneth C. Millett, Michael Piatek, Patrick Plunkett, and Andrzej Stasiak
Macromolecules, 41, 12, 4444-4451, 2008.
- *Total Curvature and Total Torsion of Knotted Polymers*
Patrick Plunkett, Michael Piatek, Akos Dobay, John C. Kern, Kenneth C. Millett, Andrzej Stasiak, and Eric J. Rawdon
Macromolecules, 40, 10, 3860-3867, 2007.

Talks

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| • <i>A Model for Supported Lipid Bilayer Formation</i>
UCSB, Santa Barbara, CA | Graduate Student Applied Math Seminar
October 2011 |
| • <i>Hydrodynamic Interaction in a Dumbbell</i>
UCSB, Santa Barbara, CA | Complex Fluids Seminar
March 2011 |
| • <i>An Introduction to Finite Element Methods</i>
UCSB, Santa Barbara, CA | PDE Class Presentation
June 2009 |
| • <i>Digital Image Processing and the Fourier Transform</i>
UCSB, Santa Barbara, CA | Graduate Student Applied Math Seminar
May 2009 |
| • <i>Curvature and Torsion in Random Knots</i>
Mercyhurst College, Erie, PA | MAA Allegheny Mountain Section Meeting
April 2007 |
| • <i>Small Enclosing Ellipsoids of Random Knots</i>
Knoxville, TN | MAA MathFest
August 2006 |
| • <i>Probabilities of Random Links</i>
Juniata College, Huntingdon, PA | MAA Allegheny Mountain Section Meeting
April 2006 |
| • <i>Detecting Symmetry in Knots</i>
Slippery Rock, PA | MAA Allegheny Mountain Section Meeting
April 2005 |

Classes Taken

- *Graduate level classes:*
Applied Stochastic Analysis, 2011 — Complex Fluids, 2011 — Continuum Mechanics, 2010 — Probability Theory & Stochastic Processes, 2009-2010 — Applied Parallel Computation, 2009 — Ordinary Differential Equations, 2007-2008 — Partial Differential Equations, 2008-2009 — Numerical Analysis, 2007-2008
- *Undergraduate level classes:*
Thermodynamics, 2009 — Databases, 2006 — Formal Languages, 2006 — Image Processing, 2006 — Software Engineering, 2006 — Artificial Intelligence, 2005 — Operating Systems, 2005 — Networks, 2004 — Data Structures, 2003