Melissa R. Adkins (Swager)

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EDUCATION

- **Doctorate of Philosophy in Mathematics, projected Spring 2015**
  Colorado State University, Fort Collins, CO
  Dissertation: "*Modeling Local Pattern Formation on Membrane Surfaces using Non-local interactions"*
  Advisor: Yongcheng Zhou
- **Master of Science in Mathematics, May 2012**
  Colorado State University, Fort Collins, CO
  Thesis: "*Electrodiffusion on the Surface of Bilayer Membranes*"
  Developed a linear surface finite element method to solve the surface electrodiffusion equation for applications in molecular biology.
  Advisor: Yongcheng Zhou
- **Bachelor of Science in Mathematics, May 2010**
  Emporia State University, Emporia, KS
  Concentration: Computer Science Minor: Economics
  Graduation: May 2010 GPA: 3.87 (Magna Cum Laude)

SKILLS

- Experience with Programming in C, C++, Fortran, Matlab, Maple, Perl,R, and LaTex
- Working knowledge of databases including SQL, Oracle, Excel and Access
- Professional training in scientific computing and numerical analysis
- Ability to take complex information and breakdown into manageable data that can be understood by a non-technical person
- Successful at collaborating and leading people and projects

PROFESSIONAL EXPERIENCE

Numerica Corporation, Loveland,CO
Intern August 2013 – January 2014
Supervisor: Chris Calderon and Randy Paffenroth

- Implemented an explosives detection algorithm for the development of a handheld explosives detector in collaboration with FLIR
- Modified several aspects of algorithms to meet limitations of device
- In collaboration with FLIR produced and marketed device
- Obtained basic security clearance

U.S. Department of Energy, Oak Ridge National Laboratory, Oak Ridge, TN
Intern June – August 2009
Advisor: Dr. Leonard J. Gray

- Conducted mathematical research on acoustic wave propagation for alternative energy projects; focus on underwater turbines.
- Developed Symmetric Galerkin Boundary Element Method for 3D Helmholtz Equations; the ability to minimize acoustic wave propagation of turbine engines.
- Published "*Galerkin Boundary Integral Analysis for the 3D Helmholtz Equation*"
- Obtained basic security clearance

Colorado State University, Fort Collins, CO

Graduate Research Assistant May 2011 – present

- Working with Dr. Yongcheng Zhou developing electrostatic models for lipid bilayer membranes
- Research in examining lipid concentrations in the presence of charged particles
- Developing numerical methods for solving partial differential equations
- Implications for drug delivery systems

Graduate Teaching Assistant August 2010 – present

- Primary instructor for
  - Calculus for Biological Scientist - 2 semesters
  - Calculus for the Management Sciences– 2 semesters
  - Financial Mathematics – 1 semester
  - Differential Equations – 1 semester
  - Calculus III – 1 semester
  - Math in the Social Sciences – 1 semester

LEADERSHIP & SERVICE

Colorado State University, Fort Collins, CO

- ***Math Circles*** – Organizer 2014 & Co-Organizer 2013 of the CSU Math Dept. Summer Camp (present)
- ***SIAM*** – 2013 Student Liaison Officer (present)
- Math, Science, and Technology Day Speaker (2012)
- Math Day – Volunteer for the Math Dept. annual math competitions (3yrs)
- MATHCOUNTS – Volunteer for the local math competitions (1 yr)

Emporia State University, Emporia, KS

Mathematics Department

- Appeals Board Member (2008 – 2010) advising curriculum and overseeing grading system for department
- Kappa Mu Epsilon Member (2008-present)
- Mathematical Contest in Modeling Honorable Mention Team Member 2010

Women's Varsity Softball (2006 – 2009)

- **Team captain**, elected by peers, 3-years in a row
- NFCA Academic All-American Athlete (2008 & 2009),
- MIAA Academic Honors Team (2008 & 2009),
- NCAA Division II Softball National Champion Runner-up (2008)

PUBLICATIONS

- *"Genetic Exponentially Fitted Method for Solving Multi-dimensional Drift-diffusion Equations".* M.R. Swager, Y.C. Zhou. Molecular Based Mathematical Biology (2012)
- "*Galerkin Boundary Integral Analysis for the 3D Helmholtz Equation*". M.R. Swager, L.J. Gray, S.Nintcheu Fata. Computer Modeling in Engineering and Sciences Journal (2009)
- *"Higher Order Exponentially Fitted Finite Element Method for solving 2-D Drift-diffusion Equations".* M.R. Swager, Y.C. Zhou. (In progress)