Joyce T. Lin

Department of Mathematics
155 S. 1400 E., JWB 233
Salt Lake City, UT, 84112
joyce.lin@utah.edu
(cell) 703-593-4657
(work) 801-585-7659
www.math.utah.edu/~lin

RESEARCH INTERESTS

Mathematical Biology and Geophysical Fluid Dynamics

EDUCATION

2009	**Doctorate of Philosophy in Mathematics** **University of North Carolina at Chapel Hill,** Carolina Center for Interdisciplinary Applied Mathematics, Department of Mathematics, Chapel Hill, NC
2004	**Bachelor of Arts in Mathematics,** Minor in Computer Science **University of Virginia,** Department of Mathematics, Charlottesville, VA Distinguished Major and Echols Scholar

PROFESSIONAL EXPERIENCE

2009–present	**Postdoctoral Research,** *University of Utah, Salt Lake City, UT* Department of Mathematics *Mentors*: James Keener and Ken Golden
2005–2009	**Doctoral Dissertation Research,** *University of North Carolina at Chapel Hill* Carolina Center for Interdisciplinary Applied Mathematics, Department of Mathematics *Advisors*: Roberto Camassa and Richard M. McLaughlin
Summer 2006	**Research Intern,** *Los Alamos National Laboratory, Los Alamos, NM* Summer Workshop in Mathematical Modeling: development and analysis of solutions to various classes of linear and nonlinear evolution equations.
Summer 2003	**Intern,** *U.S. Federal Reserve, Board of Governors, Washington, D.C.* Numerical implementation of automated data pick-up and analysis of mutual fund statistics
Summer 2002	**Intern,** *Food and Drug Administration, Bethesda, MD* Oakridge Post-Graduate Research Program: development of new methods to create vaccines using polyacrylamide gels to separate lipopolysaccharides
1999–2000	**Research Intern,** *National Institute of Mental Health, Bethesda, MD* Worked with laboratory scientists on a possible cause of schizophrenia, involving marking and imaging muscarinic cholinergic receptors in the brain.

PUBLICATIONS

1.   J. Lin and J. P. Keener, *Ephaptic coupling in cardiac myocytes,* IEEE Trans. Biomed. Eng. (2012), Accepted*.*

2.   J. Lin, D. Lubbers, C. Furse, and K. M. Golden, *Fluid permeability and structure of Antarctic sea ice* (invited paper)*,* Deep Sea Research II Special Issue: Southern Ocean Dynamics and Biogeochemistry. Submitted.

3.   K. M. Golden, H. Eicken, A. Gully, M. Ingham, K. A. Jones, J. Lin, J. Reid, C. Sampson, and A. J. Worby, *Electrical signature of brine percolation in sea ice*. Preprint in final preparation for submission to Geophysical Research Letters.

4.   E. Cherkaev, K. M. Golden, J. Lin, and C. Orum, *Algorithms for recovery of microstructural parameters in composite materials.* In preparation for Journal of Computational Physics.

5.   A. Gully, J. Lin, E. Cherkaev, and K. M. Golden, *Polycrystalline bounds on the complex permittivity of sea ice.* In preparation for Journal of Geophysical Research.

6.   J. Lin and J. P. Keener, *A model for electrical activity of myocardial cells incorporating the effects of ephaptic coupling*, PNAS **107**(2010), 20935—40.

7.   R. Camassa, C. Falcon, J. Lin, R. M. McLaughlin, and N. Mykins, *A first principle predictive theory for a sphere falling through sharply stratified fluid at low Reynolds number*, J. Fluid Mech. **664**(2010), 436—465**.**

8.   R. Camassa, C. Falcon, J. Lin, R. M. McLaughlin, and R. Parker, *Prolonged residence times for particles settling through stratified miscible fluids in the Stokes regime*, Phys. Fluids **21**(2009), 031702-1–4.

9.   J. Lin, *An experimental and mathematical study on the prolonged residence time of a sphere falling through stratified fluids at low Reynolds number,* PhD thesis, University of North Carolina at Chapel Hill (2009).

TEACHING EXPERIENCE

2009–present   **Instructor,** *Department of Mathematics, University of Utah*
Accelerated Engineering Calculus 2 (Fall 2012), Partial Differential Equations for Engineering Students (Spring 2012), Introduction to Ordinary Differential Equations (Fall 2011), Accelerated Engineering Calculus 2 (Spring 2011), Calculus 2 (Spring 2011), Quantitative Analysis (Spring 2010), Calculus 1 (Fall 2009), Mathematical Survival Skills (Fall 2009).

2004–2009   **Instructor,** *Department of Mathematics, University of North Carolina at Chapel Hill*
Precalculus (Fall 2008, 2 sections), College Algebra (Spring 2005)

Tutor*, University of North Carolina at Chapel Hill*
Multivariable Calculus (Spring 2008), College Algebra (Fall 2007)

2003   **Teaching Assistant,** *University of Virginia*
Software Development Methods (Fall 2003)

CONFERENCE TALKS

Feb. 2012	**Ocean Sciences Meeting**, *Salt Lake City, UT* "Fluid Permeability and the Structure of Antarctic Sea Ice." Session on the Southern Ocean and Its Role in the Climate System.
Nov. 2011	**SIAM Conference on Analysis of Partial Differential Equations,** *San Diego, CA* "A New Electrical Model of Cardiac Cells." Session Chair
Oct. 2011	**AMS 2011 Western Section Meeting**, *Salt Lake City, UT* "A Multiscale Model of Electrical Activity in Cardiac Tissue." Special session on Understanding Bio-fluids via Modeling, Simulation and Analysis.
Jul. 2011	**ICIAM,** *Vancouver, Canada* "A New Microscale Model for Electrical Activity of Myocardial Cells Incorporating the Effects of Ephaptic Coupling." Invited speaker, Association for Women in Mathematics Workshop.
Feb. 2011	**Gould Lecture**, *Salt Lake City, UT* "Fire and Ice: Measuring Antarctica's Frozen Sea."
Jan. 2009	**Joint Mathematics Meetings**, *Washington, D.C.* "A Falling Sphere in Stratified Fluid." Session Chair, Contributed Paper Session: Quantum Theory and Fluid Mechanics
Nov. 2008	**Meeting of the APS Division of Fluid Dynamics**, *San Antonio, TX* "A Falling Sphere in Stratified Fluid."
Nov. 2008	**South Eastern Atlantic Mathematical Sciences Workshop**, *Chapel Hill, NC* "A Falling Sphere in Stratified Fluid."
May 2007	**2007 SIAM Conference on Applications of Dynamical Systems**, *Snowbird, UT* "A Falling Sphere in Stratified Fluid."

SEMINAR TALKS – "A FALLING SPHERE IN STRATIFIED FLUID"

Sept. 2009	**University of Utah**, *Salt Lake City, UT*
Feb. 2009	**University of North Carolina at Chapel Hill**, *Chapel Hill, NC*
Jan. 2009	**George Mason University Applied Math Seminar**, *Fairfax, VA*

MEETINGS AND WORKSHOPS

Jun. 2011	**MBI Workshop: Ocean Ecologies and their Physical Habitats in a Changing Climate**, *San Diego, CA* Tutorial session organizer
Sept. 2010	**Math and Climate Research Network Meeting**, Chapel Hill, NC
Feb. 2010	**Mathematics of Interacting Climate Processes**, National Center for Atmospheric Research, Boulder, CO

POSTER PRESENTATIONS

May 2011	**Coalition for National Science Funding Annual Capitol Hill Exhibition,** *Washington D.C.*
Nov. 2008	**Meeting of the APS Division of Fluids Dynamics**, *San Antonio, TX* Gallery of Fluid Motion
Oct. 2007	**South Eastern Atlantic Mathematical Sciences Workshop**, *Hampton, VA* National Institute of Aerospace
Mar. 2007	**University Research Day,** *Chapel Hill, NC*
Sept. 2006	**South Eastern Atlantic Mathematical Sciences Workshop**, *Charleston, SC*

GRANTS AND FELLOWSHIPS (SUPPORTED)

2012–present	**National Institutes of Health** 1R01HL102298-01
2009–2012	**NSF Vertical Integration of Research and Education Grant** NSF-DMS-0602219
2010	**Collaborations in Mathematical Geosciences** (supported Antarctic trip) ARC-0934721 **NSF Collaborative Research: Mathematics and Climate Change Research Network Grant** (supported Antarctic trip) DMS-0940249
2005–2009	**NSF Research Training Grant** RTG DMS-0502266

REFEREE

Physical Review A
Multiscale Modeling and Simulation
Applications and Applied Mathematics: An International Journal

OUTREACH

2011	**Family Fun with Engineering: Fire and Ice: From Antarctica to the Arctic** Demonstrations and a talk held at the city library.
2011	**Online Math-Climate Resource**, Created exercises
2011	**9th Intermountain Jr. Science & Humanities Symposium**, Judge
2011	**"Aftermath" Department Newsletter,** Contributor
2011	**Emerson Elementary School Science Fair,** Judge
2010	**Antarctica Expedition Blog**, Contributor http://redthread.utah.edu/tag/antarctica
2010	**Antarctica Expedition Radio Interviews**, Interviewee http://redthread.utah.edu/live-from-Antarctica-weeks-2-and-3/4613
2009–2011	**Calculus Carnival**, Games organizer
2008	**American Physical Society** Gallery of Fluid Motion Virtual Press Room http://www.aps.org/units/dfd/pressroom/gallery/2008/lin.cfm

HONORS

2011	**"Women of Note"**
	President's Commission on the Status of Women Selection
2007	**Lindau Nobel Laureates Meeting**
	NSF sponsored participant, Physiology and Medicine
2004	**The Betty and Lee Smith Fund for Excellence in Mathematics**

COMPUTER PROFICIENCY

Matlab, Fortran, COMSOL, Mathematica, C++, Java, C#, Maple

PROFESSIONAL ASSOCIATIONS

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

REFERENCES

James P. Keener
Distinguished Professor of Mathematics
Adjunct Professor of Bioengineering
Department of Mathematics, University of Utah
keener@math.utah.edu

Kenneth M. Golden
Professor of Mathematics
Adjunct Professor of Bioengineering
Department of Mathematics, University of Utah
golden@math.utah.edu

Roberto Camassa
Professor of Mathematics
Department of Mathematics, University of North Carolina at Chapel Hill
camassa@amath.unc.edu

Cynthia Furse
Associate Vice President for Research
Professor of Electromagnetics
Department of Electrical and Computer Engineering, University of Utah
cynthia.furse@utah.edu

Steven Poelzing
Associate Professor, Virginia Tech Carilion Research Institute
Associate Professor, School of Biomedical Engineering and Science
Virginia Tech
poelzing@vtc.vt.edu

Henryk Hecht (Teaching)
Professor of Mathematics
Department of Mathematics, University of Utah
hecht@math.utah.edu