

Kay Kirkpatrick

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Warren Weaver Hall 1310, New York, NY 10012

Research Interests

Statistical mechanics, partial differential equations, and dynamical systems.

Education

Massachusetts Institute of Technology Visiting doctoral student, 2005-2007
University of California, Berkeley Ph.D. in math, 2007
 Thesis Title: "Rigorously deriving the Landau equation in the weak coupling limit"
 Advisor: Fraydoun Rezakhanlou
Montana State University, Bozeman B.S. in Mathematics, 2002

Academic Appointments

New York University, Courant Instructor/PIRE Fellow, since 2009
Massachusetts Institute of Technology, NSF postdoctoral fellow, 2007 - 2009

Fellowships and Scholarships

Courant/NSF PIRE Fellowship, dates to be determined
National Science Foundation Mathematical Sciences Postdoctoral Fellowship, 2007 - 2009
AAUW American Dissertation Fellowship, 2006 - 2007
National Science Foundation Graduate Research Fellowship, 2002 - 2005
Phi Kappa Phi, Kathleen Greey Graduate Fellowship, 2002 - 2003
Barry Goldwater Math and Science Scholarship, 2001 - 2002
Montana Space Grant Consortium Scholarship, 2000 - 2001
Robert Byrd Memorial Scholarship, 1998 - 2002
MSU-Bozeman Presidential Scholarship, 1998 - 2002
Mares Foundation Piano Scholarship, 1998 - 2002

Prizes and Awards

Alice T. Schafer Prize (awarded to top undergraduate woman in math nationwide), 2002
USA Today All-American Academic Third Team Member, 2002
Dean's Award for Academic Excellence in the College of Letters and Science, MSU, 2002

Academic Talks

Pacific Institute for the Mathematical Sciences, Workshop on nonlinear dispersive and geometric evolution problems, Aug. 21, 2009.
Centre de Recherches Mathematiques, Workshop on Spin Glasses, June 12, 2009.
Centre de Recherches Mathematiques, Workshop on Interacting Stochastic Particle Systems, May 21, 2009.
Montana State University special colloquium, Apr. 16, 2009.

- Courant Institute, NYU, probability seminar, Mar. 27, 2009.
 Case Western Reserve University Applied Math seminar, Mar. 16, 2009.
 MIT PDE/analysis seminar, Feb. 25, 2009.
 Boston University Dynamical Systems seminar, Jan. 29, 2009.
 University of Rochester colloquium, Jan. 27, 2009.
 UC Berkeley Analysis and Partial Differential Equations seminar, Sept. 22, 2008.
 Clay Math Summer School in Zürich on Evolution Equations talk, July 16, 2008.
 Case Western Reserve University math department colloquium, Oct. 19, 2007.
 MIT Partial Differential Equations and Analysis seminar, Dec. 6, 2006.
 UC Berkeley partial differential equations and probability seminars, April - May, 2005.
 American Mathematical Society special session at the Joint Meetings, January 2002.
 University of Houston Math Research Experience for Undergraduates:
 “The Shilov boundary of operator spaces,” July 2001.
 North Carolina State University Mathematics Modeling Workshop for Graduate Students:
 “Modeling HIV infection dynamics using delay differential equations,” July 2000.

Publications

- Kirkpatrick, K.; Schlein, B.; and Staffilani, G. “Derivation of the two dimensional nonlinear Schrodinger equation from many body quantum dynamics.” Submitted, 2008.
 Kirkpatrick, K. “Rigorous derivation of the Landau equation in the weak coupling limit.” Submitted, 2008.
 Blecher, D.; Kirkpatrick, K.; Neal, M.; and Werner, W. “Ordered involutive operator spaces.” *Positivity*, vol. 11, 2007, 497-509.
 Teppo, Anne R., Esty, Warren W., and Kirkpatrick, Kay. “The Assessment of Mathematical Logic: Abstract Patterns and Familiar Contexts,” *Psychology in Mathematics Education, Proceedings of the 25th Annual Meeting*, July 2003, 283-290.
 Kirkpatrick, K. “The Shilov Boundary and M -structure of Operator Spaces.” University of Houston mathematics preprint journal, August 2001.
 Bortz, D.; Guy, B.; Hood, J.; Kirkpatrick, K.; Nguyen, V.; and Shimanovich, V. “Modeling HIV infection dynamics using delay differential equations.” CRSC Technical Report (Pierre A. Gremaud, Zhilin Li, Ralph C. Smith, and Hien T. Tran, eds.) CRSC-TR00-24, October 2000.

Articles in Preparation

- Ben Arous, G. and Kirkpatrick, K. “Large deviations in mean-field boson systems.”
 Blanchet, J. and Kirkpatrick, K. “An algorithm for large deviations in mean-field boson systems.”
 Kirkpatrick, K. and Meckes, E. “Asymptotic distribution of the average spin in the spherical Ising model.”
 Kirkpatrick, K.; Lenzmann, E.; and Staffilani, G. “Quantum lattice systems and fractional nonlinear Schrödinger equations.”
 Kirkpatrick, K. and Rezakhanlou, F. “The evolution of a tagged particle in the Boltzmann-Grad limit.”

Conferences Attended

Clay Math Summer School on Evolution Equations in Zürich; June 22 - July 18, 2008
 IAS/Park City Math Institute Research Program on Statistical Mechanics; July 1-21, 2007
 MSRI Connections for Women: Dynamical Systems; January 18-19, 2007
 International Conference on Stochastic Analysis and PDEs; Northwestern University; June 2005
 Geometric and Nonlinear Analysis Conference; University of Notre Dame; September 2004
 Analysis on Manifolds; Swiss Mathematical Society; Fribourg, Switzerland; June 2004
 Conference on Spectral Analysis in Geometry and Physics; University of California, San Diego; January 2003

Teaching

New York University, Calculus II, fall 2009
 Stanford University Educational Program for Gifted Youth instructor, math, summer 2007
 Stanford University instructor, Ordinary Differential Equations, summer 2006
 Stanford University Mathematics Camp counselor, summers 2003 - 2006
 Montana State University instructor, Language of Mathematics, 2001 - 2002

Employment

Center for Computational Biology, MSU, research assistant, 1999 - 2002
 Complex Biological Systems, MSU, summer research assistant, 2000

Other Activities

Girls' Angle mentor, Bulletin editor, member of advisory board, Fall 2008 to present
 Stanford University Mathematics Camp guest lecture: "A random walk through statistical mechanics," July 27, 2007.
 MIT's women mathematicians group, August 2005 to present
 Noetherian Ring, Berkeley's female mathematicians' group, 2002 - 2007
 Expanding Your Horizons group leader, panel member, and program presenter, 2001 - 2002
 Languages: French, Spanish, ancient Greek, and German

References

Fraydoun Rezakhanlou, UC Berkeley
 Lawrence Craig Evans, UC Berkeley
 Gigliola Staffilani, MIT
 Horng-Tzer Yau, Harvard
 Rafe Mazzeo, Stanford
 Ravi Vakil, Stanford (teaching)