

# Kay Kirkpatrick

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## Research Interests

Statistical mechanics, PDEs, condensed matter physics, and biological computation.

## Education

PhD, University of California, Berkeley, 2007, Advisor: Fraydoun Rezakhanlou

BS, Montana State University, Bozeman, 2002

## Academic Positions

MIT, Visiting Associate Professor of Mathematics, Fall 2017

University of Illinois at Urbana-Champaign, Associate Professor of Physics, 2017 -

University of Illinois at Urbana-Champaign, Associate Professor of Mathematics, 2016 -

MSRI program New Challenges in PDE, Research Professor and Organizer, Fall 2015

University of Illinois at Urbana-Champaign, Assistant Professor, 2011 - 2016

Université de Paris IX Dauphine, Visiting Professor, June 2012

New York University, Courant Instructor/NSF PIRE Fellow, 2009 - 2011

MIT, NSF Postdoctoral Fellow, 2007 - 2009

## Selected Accolades

Simons Fellow in Mathematics, 2017 - 2018

David Blackwell Scholar in Mathematics, 2016 - 2018

Helen Corley Petit Scholar, College of Letters and Sciences, 2016 - 2017

NSF CAREER Award DMS-1254791, May 2013 - present

NSF Division of Mathematical Sciences grant, DMS-1106770, 2011 - 2014

AAUW American Dissertation Fellowship, 2006 - 2007

NSF Graduate Research Fellowship, 2002 - 2005

Schafer Prize, 2002

## Selected Talks

Logic seminar at University of Illinois at Urbana-Champaign, Jan 2018

Random matrices seminar at Harvard, Nov 2017

PDE, Probability, and Physics of Living Systems seminars at MIT, Nov 2017

Colloquium and Mathematical Physics Seminar at Purdue University, Feb - Mar 2017

SIAM Conference on Nonlinear Waves and Coherent Structures, PA, August 2016

Plenary talk at the Great Lakes Mathematical Physics Meeting, June 2016

Plenary talk at Frontier Probability Days, May 2016

Plenary talk at Texas Analysis and Mathematical Physics Symposium 2015, Nov. 2015

Colloquium at UC Berkeley, Sept. 2015

Conference in Stochastic Analysis and Related Topics, Purdue, May 2015

Colloquium at UW-Madison, April 2015

Colloquium at Southern Illinois University, April 2015  
 Plenary talk at the 5th Ohio River Analysis Meeting, Cincinnati, March 2015  
 36th Midwest Probability Colloquium, Northwestern, October 2014  
 BIRS Workshop, Spin Glasses and Related Topics, Banff, July 2014  
 KI-Net workshop on Complex Quantum Systems, UIC, Mar. 2014  
 University of Minnesota Probability seminar, Oct. 2013  
 71st Midwest PDE seminar, May 2013

## Selected Publications

Kirkpatrick, K. and Nawaz, T. “Asymptotics of mean-field  $O(N)$  models.” *J. Stat. Phys.* (2016) 165: 1114.

Kirkpatrick, K. and Nawaz., T. “Critical behavior of mean-field XY and related models,” in *Stochastic Analysis and Related Topics, A Festschrift in Honor of Rodrigo Baueles*; F. Baudoin & J. Peterson (Eds.), 207-221 (2017).

Kirkpatrick, K. and Zhang, Y. “Fractional Schrödinger dynamics and decoherence.” *Physica D* Vol. 332 (2016), 41–54.

Brannan, M. and Kirkpatrick, K. “Quantum groups and generalized circular elements.” *Pacific J. Math.*, Vol. 282 (2016), No. 1, 35–61.

Kirkpatrick, K. and Meckes, E. “Asymptotics of the mean-field Heisenberg model.” *J. Stat. Phys.*, 152:1, 2013, 54-92.

Kirkpatrick, B. and Kirkpatrick, K. “Optimal State-Space Reduction for Pedigree Hidden Markov Models.” Submitted.

Ben Arous, G., Kirkpatrick, K., and Schlein, B. “A Central Limit Theorem in many-body quantum dynamics.” *Comm. Math. Phys.*, 321:2, 2013, 371-417.

Kirkpatrick, K. “Solitons and Gibbs measures for nonlinear Schrödinger equations.” Invited article accepted for the special “Solitary waves” issue of *Math. Modelling of Natural Phenomena*, v.7, 2012, 95.

Kirkpatrick, K.; Lenzmann, E.; and Staffilani, G. “On the continuum limit for discrete NLS with long-range lattice interactions.” *Comm. Math. Phys.*, 317:3, 2013, 563-591.

Chatterjee, S. and Kirkpatrick, K. “Probabilistic methods for discrete nonlinear Schrödinger equations.” *Comm. in Pure and Appl. Math.*, 65:5, 2012, 727-757.

Kirkpatrick, K., Staffilani, G., and Schlein, B. “Derivation of the two dimensional nonlinear Schrödinger equation from many body quantum dynamics.” *Amer. J. of Math.*, 133:1, 2011, 91-130.

Kirkpatrick, K. “Rigorous derivation of the Landau equation in the weak coupling limit.” *Comm. in Pure and Appl. Analysis*, 8:6, November 2009, 1895 - 1916.

Blecher, D., Kirkpatrick, K., Neal, M., and Werner, W. “Ordered involutive operator spaces.” *Positivity*, vol. 11, 2007, 497-509.

## Organizing

UIUC Probability seminar, 34th and 39th Midwest Probability Colloquium, Conference on New Developments in Probability at Northwestern, Fall 2015 program at MSRI.