# Curriculum Vitae

## Jonathon Peterson

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## Education

**University of Minnesota** Minneapolis, MN 2003–2008
M.Sc. and Ph.D. in Mathematics
Thesis advisor: Ofer Zeitouni
Thesis title: *Limiting Distributions and Large Deviations of Random Walks in Random Environments.*

**Northwestern College** St. Paul, MN 1999–2003
Bachelor of Science in Mathematics

## Employment

**Purdue University** 2011–
Assistant Professor

**Cornell University** 2009–2011
NSF Postdoctoral Fellow and H.C. Wang Assistant Professor

**University of Wisconsin - Madison** 2008–2009
NSF Postdoctoral Fellow and Van Vleck Assisant Professor

## Research Interests

**Probability** Random walks in random environments, reinforced/excited random walks, interacting particle systems, particle systems in random environments, large deviations, trap models.

**Mathematics and Sports** Mathematically based ranking systems, probabilistic models for sports, non-transitive models for sports, analysis of computer ranking systems.

## Grants

**NSF Conferences and Workshops in the Mathematical Sciences** 2015
*Conference in Stochastic Analysis and Related Topics.*
Award amount: $20,000

**NSA Young Investigators Grant** 2013–2015
*Random walks and particle systems in random environments.*
Award amount: $36,957

**Purdue International Travel Grant** 2014
Award amount: $1,000

**NSA Young Investigators Grant** 2015–2017
*Self-interacting random walks and particle systems.*
Award amount: $40,000

## AWARDS AND FELLOWSHIPS

**Teaching For Tomorrow Award** Purdue University 2014–2015

**NSF Postdoctoral Fellowship** 2008–2011

**Good Teaching Award** University of Minnesota 2008

**Doctoral Dissertation Fellowship** University of Minnesota 2007–2008

**Ordway Fellowship** University of Minnesota 2003–2004

## REFEREED PUBLICATIONS

PUBLISHED

1. Jonathon Peterson. "Extreme slowdowns for one-dimensional excited random walks". In: *Stochastic Process. Appl.* 125.2 (2015), pp. 458–481
2. Jonathon Peterson. "Large deviations for random walks in a random environment on a strip". In: *ALEA Lat. Am. J. Probab. Math. Stat.* 11.1 (2014), pp. 1–41
3. Jonathon Peterson. "Strict monotonicity properties in one-dimensional excited random walks". In: *Markov Process. Related Fields* 19.4 (2013), pp. 721–734
4. Jonathon Peterson and Gennady Samorodnitsky. "Weak quenched limiting distributions for transient one-dimensional random walk in a random environment". In: *Ann. Inst. Henri Poincaré Probab. Stat.* 49.3 (2013), pp. 722–752
5. Jonathon Peterson. "A Probabilistic Proof of a Binomial Identity". In: *Amer. Math. Monthly* 120.6 (2013), pp. 558–562
6. Jonathon Peterson and Gennady Samorodnitsky. "Weak weak quenched limits for the path-valued processes of hitting times and positions of a transient, one-dimensional random walk in a random environment". In: *ALEA Lat. Am. J. Probab. Math. Stat.* 9.2 (2012), pp. 531–569
7. Jonathon Peterson. "Large deviations and slowdown asymptotics for one-dimensional excited random walks". In: *Electron. J. Probab.* 17.48 (2012), pp. 1–24
8. Nina Gantert and Jonathon Peterson. "Maximal displacement for bridges of random walks in a random environment". In: *Ann. Inst. Henri Poincaré Probab. Stat.* 47.3 (2011), pp. 663–678
9. Jonathon Peterson. "The contact process on the complete graph with random vertex-dependent infection rates". In: *Stochastic Process. Appl.* 121.3 (2011), pp. 609–629
10. Jonathon Peterson and Timo Seppäläinen. "Current fluctuations of a system of one-dimensional random walks in random environment". In: *Ann. Probab.* 38.6 (2010), pp. 2258–2294

11. Jonathon Peterson. "Systems of one-dimensional random walks in a common random environment". In: *Electron. J. Probab.* 15 (2010), no. 32, 1024–1040

12. Jonathon Peterson and Ofer Zeitouni. "On the annealed large deviation rate function for a multi-dimensional random walk in random environment". In: *ALEA Lat. Am. J. Probab. Math. Stat.* 6 (2009), pp. 349–368

13. Jonathon Peterson. "Quenched limits for transient, ballistic, sub-Gaussian one-dimensional random walk in random environment". In: *Ann. Inst. Henri Poincaré Probab. Stat.* 45.3 (2009), pp. 685–709

14. Jonathon Peterson and Ofer Zeitouni. "Quenched limits for transient, zero speed one-dimensional random walk in random environment". In: *Ann. Probab.* 37.1 (2009), pp. 143–188

### Submitted

1. Milton Jara and Jonathon Peterson. *Hydrodynamic limit for a system of independent, sub-ballistic random walks in a common random environment.* Oct. 2014. arXiv: `1410.4832v1`

2. Elena Kosygina and Jonathon Peterson. *Excited random walks with Markovian cookie stacks.* Apr. 2015. arXiv: `1504.06280v1 [math.PR]`

3. Burgess Davis and Jonathon Peterson. *Excited random walks with non-nearest neighbor steps.* Apr. 2015. arXiv: `1504.05124v1 [math.PR]`

4. Jonathon Peterson. *Strong transience of one-dimensional random walk in a random environment.* June 2015. arXiv: `1506.03048v1 [math.PR]`

5. Sung Won Ahn and Jonathon Peterson. *Oscillations of quenched slowdown asymptotics for ballistic one-dimensional random walk in a random environment.* Sept. 2015. arXiv: `1509.00445v1 [math.PR]`

## Advising and Research Supervision

### Graduate Students

**Sung Won Ahn** Purdue University 2012–
To graduate in Spring of 2016
One joint paper submitted for publication

### Undergraduate Research Supervision

**Cole Manschot** Purdue University 2015–
*Modifications of the Colley Matrix ranking method* (honors thesis - in progress)

**Jingdan Liu** Purdue University 2012
*The joint density of the determinant and trace of a random* $2 \times 2$ *matrix.*
Presented at the Purdue Undergraduate Research Poster Symposium

**Lirong Yuan** Purdue University 2012
*Roots of polynomials with random integer coefficients.*

Presented at an Indiana MAA Section meeting

Presented at the Rose-Hulman Undergraduate Math Conference

(best presentation award finalist)

**João Machado** Cornell University 2009-2010
*Non-transitivity in probabilistic models for ranking sports teams.*

Presented at a Seaway Section MAA meeting.

## PROFESSIONAL ACTIVITIES

**Committee Service**

Math Department Computer Committee 2013–
*Committee chair - Spring 2015*
IT Operational Oversight Committee 2015–

**Minicourses**

IMPA (Rio de Janeiro) Summer School January 15-25, 2013

*Random Walks in Random Environment* (5 lectures)

**Conferences**

Special Session - AMS Central Section Meeting (North Dakota State) April 2016
*Co-organizer:* Discrete Probability

MAA Contributed Papers Session - Joint Math Meetings January 2016
*Co-organizer:* Experiences and Innovations in Teaching Probability Theory

Stochastic Analysis and Related Topics (Purdue University) May 2015
*Co-organizer*

Midwest Probability Colloquium October 2014
*Scientific committee*

Special Session - AMS Central Section Meeting (Iowa State University) April 2013
*Co-organizer:* Stochastic Processes with Applications to Physics and Control

Random environments conference (Cornell University) May 2011
*Co-organizer*

**Seminars organized**

Purdue Probability Seminar Fall 2012 –
Cornell Probability Seminar Fall 2010 – Spring 2011
University of Minnesota Jr. Colloquium Fall 2006 – Spring 2007

**Journals refereed for**

ALEA - Latin American Journal of Probability and Mathematical Statistics
American Mathematical Monthly
Annales de l'Institut Henri Poincaré, Probabilités et Statistiques
Annals of Applied Probability

Annals of Probability
Electronic Communications in Probability
Electronic Journal of Probability
The Fibonacci Quarterly
Journal of Applied Probability
Journal of Statistical Physics
Journal of Theoretical Probability
Physica A: Statistical Mechanics and its Applications
Probability Theory and Related Fields
Stochastic Processes and their Applications

**External reviewing activities**

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|---|---|
| European Research Council "ERC Starting Grant - 2015" | 2015 |
| PhD thesis of Thomas Kochler, Technische Universität München | 2012 |
| CUNY faculty research grants | 2010 |

## PRESENTATIONS

### PROBABILITY/DEPARTMENT SEMINAR PRESENTATIONS

| | |
|---|---|
| **University of North Carolina** | October 2014 |
| **University of Wisconsin** | September 2014 |
| **Technical University of Munich** | May 2014 |
| **NYU - Courant Institute** | May 2014 |
| **Ohio State University** | March 2014 |
| **Indiana University** | February 2014 |
| **CUNY** | February 2014 |
| **Purdue** | January 2014 |
| **Purdue** | August 2013 |
| **University of Maryland, College Park** | March 2013 |
| **Purdue** | February 2013 |
| **IMPA (Rio de Janeiro)** | January 2013 |
| **University of Connecticut** | November 2012 |
| **University of Virginia** | September 2012 |
| **Purdue University** | September 2012 |
| **Iowa State University** Department Colloquium | March 2012 |
| **Iowa State University** | March 2012 |

**University of Illinois** March 2012

**University of Chicago** December 2011

**Columbia University** October 2011

**Purdue University** August 2011

**Purdue University** January 2011

**Lehigh University** Department Colloquium January 2011

**University of Oregon** Department Colloquium January 2011

**Wayne State university** Department Colloquium January 2011

**University of Illinois at Chicago** Department Colloquium January 2011

**University of Virginia** September 2010

**Cornell University** September 2010

**Johns Hopkins** Department of Applied Mathematics Colloquium April 2010

**University of Rochester** March 2010

**Cornell University** March 2010

**University of Wisconsin - Madison** February 2010

**Cornell University** September 2009

**University of Wisconsin - Madison** April 2009

**University of Minnesota** October 2008

**University of Wisconsin - Madison** September 2008

**Hebrew University - Jerusalem, Israel** April 2008

**Weizmann Institute of Science - Rehovot, Israel** April 2008

**Cornell University** February 2008

**University of Utah** January 2008

**Iowa State University** November 2007

**Technion University - Haifa, Israel** June 2007

**University of Minnesota** February 2007

### CONFERENCE PRESENTATIONS - INVITED

**EURANDOM - TU Eindhoven** April 2014
Workshop on Random Motion in Random Media

**AMS Central Section Meeting** March 2014
Special Session: Discrete Stochastic Models

**AMS Central Section Meeting** April 2013
Special Session: Stochastic Processes with Applications to Physics and Control

**MSRI** Random Walks and Random Media May 2012

**Fields Institute** Interacting Processes in Random Environments February 2011

**University of British Columbia** Random Walks in Random Environments June 2009

**Centre de Recherches Mathématiques** Interacting Particle Systems May 2009

**Mittag Leffler Institute** Program on Discrete Probability January 2009

**MFO - Oberwolfach, Germany** Non-classical Interacting Random Walks May 2007

CONFERENCE PRESENTATIONS - CONTRIBUTED TALKS

**Stochastic Processes and their Applications** July 2015

**Stochastic Processes and their Applications** July 2014

**Stochastic Processes and their Applications** July 2013

**Northeast Probability Seminar** Columbia University November 2010

**Graduate Student Probability Conference** University of Wisconsin May 2008

**Joint Mathematics Meetings** January 2008

**Stochastic Processes and their Applications** August 2007

**Graduate Student Probability Conference** University of Wisconsin April 2007

PRESENTATIONS TO UNDERGRADUATE / HIGH SCHOOL STUDENTS

**Huntington University** Gerald D Smith Lecture Series in the Natural and Mathematical Sciences May 2015
*My life as a "professional mathematician"*

**Purdue University** Math Club April 2015
*Non-classical random walks - simple models, surprising results and (embarrasing) open problems.*

**Purdue University** Math Club March 2014
*The mathematics of ranking sports teams*

**St. John Fisher College** Math Awareness Month Presentation April 2010
*Linear algebra and the BCS*

**University of Wisconsin - La Crosse** MAA Wisconsin Section Meeting April 2009
*Nonclassical random walks: Simple models, surprising results, and (embarrassing) open problems.*

**University of Minnesota** Jr. Colloquium October 2005
*A Random Walk Through Electrical Engineering.*

**Central Wisconsin Math League** Awards banquet guest speaker May 2009
*What is a professional mathematician?*

### TEACHING PRESENTATIONS

**Cornell University** Teaching Seminar March 2010
*Teaching with Tablet PCs and Video Lecture Capture Technology.*

## TEACHING EXPERIENCE

**Assistant Professor** Purdue University 2011–

**Undergraduate courses**
Elementary Linear Algebra I & II (MA 351)
Linear Algebra II with Applications (MA 353)
Elementary Stochastic Processes (MA 490 - topics course)

**Graduate courses**
Elements of Stochastic Processes (MA 532)
Introduction to Probability (MA 519)
Probability Theory I & II (MA 538 and 539)

**Visiting Assistant Professor** Cornell University 2009–2010
Calculus III
Basic Probability
Random Walks in Random Environments (graduate level)

**Visiting Assistant Professor** University of Wisconsin - Madison 2008
Introduction to Probability Theory

## PROFESSIONAL SOCIETIES

American Mathematical Society (AMS)

Mathematical Association of America (MAA)

Institute of Mathematical Statistics (IMS)