Arjun Krishnan

University of Rochester
Department of Mathematics
Hylan 817
Rochester, NY 14627

+1–734–845–9846 (mobile)
arjun.krishnan@rochester.edu
web.math.rochester.edu/people/faculty/akrish11/

Research Interests

Probability theory, percolation and disordered systems, stochastic homogenization of Hamilton-Jacobi equations, ergodic theory, concentration of measure.

Employment

Assistant Professor July 2017–Present
University of Rochester, Department of Mathematics

Wiley Assistant Professor/Lecturer January 2015–June 2017
University of Utah, Department of Mathematics

Fields Postdoctoral Fellow July–December 2014
Fields Institute for Research in Mathematical Sciences

Associate Research Engineer October 2008–June 2009
New Technologies Division, MTU Detroit Diesel Inc., Redford, MI

Education

Doctor of Philosophy in Mathematics May 2014
New York University, Courant Institute of Mathematical Sciences
Advisors: S.R.S. Varadhan, S. Chatterjee
Dissertation: Variational formula for the time-constant of first-passage percolation

Master of Science in Mechanical Engineering August 2008
University of Michigan
Advisor: B.I. Epureanu
Thesis: The Random Walker: Stochastic Mechano-Chemical Models for Motor Proteins

Bachelor of Technology in Mechanical Engineering July 2006
Indian Institute of Technology Madras
Advisors: A. Ramesh, V. Babu, R.I. Sujith

Awards and Grants

Simons Grant May 2019

AMS Simons Travel Grant May 2014

MacCracken Fellowship 2010–2014
Awarded by New York University in support of graduate studies in mathematics

William Mirsky Memorial Award March 2008
Awarded by University of Michigan for outstanding research and academic achievements

Bronze Medalist August 2002
Represented India at the International Chemistry Olympiad.

Best Experimental Work Award June 2002
Awarded by the Indian National Chemistry Olympiad

Publications and Preprints

A. Krishnan, F. Rassoul-Agha, and T. Seppäläinen. On the coalescence time of Busemann geodesics in first-passage percolation. *In preparation* (2021)

J. Chaika and A. Krishnan. Stationary coalescing walks on the lattice II: entropy. *accepted pending revisions to Nonlinearity* (Mar. 2021). arXiv: 1909.04816.

I. Alevy and A. Krishnan. Negative correlation of adjacent Busemann increments. *arXiv:2102.06337 [math] (Submitted)* (Feb. 2021). arXiv: 2102.06337.

A. Krishnan, F. Rassoul-Agha, and T. Seppäläinen. Geodesic length and shifted weights in first-passage percolation. *arXiv:2101.12324 [math] (Submitted)* (Jan. 2021). arXiv: 2101.12324.

A. Krishnan and S. Neville. Kostka Numbers and Longest Increasing Subsequences. *arXiv:1907.03881 [math]* (July 2019). arXiv: 1907.03881.

J. Chaika and A. Krishnan. Stationary coalescing walks on the lattice. *Probability Theory and Related Fields* (2018). DOI: https://doi.org/10.1007/s00440-018-0893-2

A. Krishnan and J. Quastel. Tracy–Widom fluctuations for perturbations of the log-gamma polymer in intermediate disorder. *Ann. Appl. Probab.* 28.6 (2018), pp. 3736–3764. ISSN: 1050-5164. DOI: 10.1214/18-AAP1404

A. Krishnan. Variational Formula for the Time Constant of First-Passage Percolation. *Comm. Pure. Appl. Math.* 69.10 (June 2016), pp. 1984–2012. DOI: 10.1002/cpa.21648.

A. Krishnan. Variational formula for the time-constant of first-passage percolation. Thesis (Ph.D.)–New York University. ProQuest LLC, Ann Arbor, MI, 2014. ISBN: 978-1-321-16163-2.

A. Krishnan and B. I. Epureanu. Renewal-Reward Process Formulation of Motor Protein Dynamics. *Bulletin of mathematical biology* 73.10 (2011), pp. 2452–2482. DOI: https://doi.org/10.1007/s11538-011-9632-x

Conference Proceedings

A. Krishnan and B. I. Epureanu. A stochastic mechano-chemical model for cooperative motor protein dynamics. *Proceedings of SMASIS 2008*. 2008

A. Krishnan, K. Balasubramaniam, and R. I. Sujith. Asymptotic Solution for the One Dimensional Euler Equations for Isentropic Flow in a Variable Area Duct. *Proceedings of the 37th AIAA Fluid Dynamics Conference and Exhibit*. 2007. DOI: 10.2514/6.2007-4005

A. Krishnan et al. Prediction of NOx reduction with Exhaust Gas Recirculation using the Flame Temperature Correlation Technique. *Proceedings of the National Conference on Advances in Mechanical Engineering*. 2006, pp. 18–19

Teaching

Instructor
University of Rochester

- MTH 507 Advanced Topics in Probability: First-Passage Percolation — Fall 2020
- MTH 165 Linear Algebra and Differential Equations — Fall 2020
- MTH 165 Linear Algebra and Differential Equations — Spring 2020
- MTH 202 Introduction to Stochastic Processes — Spring 2020
- MTH 471 Real Analysis — Fall 2019
- MTH 201 Introduction to Probability — Spring 2019
- MTH 201 Introduction to Probability — Fall 2018
- MTH 504 Stochastic Processes — Spring 2018
- MTH 202 Introduction to Stochastic Processes — Spring 2018
- MTH 201 Introduction to Probability — Fall 2017

University of Utah

- Stochastic Processes and Simulation - II — Spring 2017
- Stochastic Processes and Simulation - I — Fall 2016
- Introduction to Probability — Spring 2016
- Actuarial Mathematics — Spring 2016
- Introduction to Statistics — Spring 2015

New York University

- Putnam Mathematical Competition — Fall 2011
- Calculus II — Summer 2011
- Putnam Mathematical Competition — Fall 2010
- Calculus I — Summer 2010

Teaching Assistant
New York University

- Theory of Numbers — Fall 2012
- Probability Limit Theorems II — Spring 2012
- Basic Probability — Spring 2012
- Ordinary Differential Equations — Spring 2011

Graduate Student Instructor
University of Michigan

- Thermodynamics Winter 2008
- Fluid Dynamics Fall 2007
- Thermodynamics Winter 2007

Talks and Presentations

Busemann functions and coalescence of geodesics

- *AMS Sectional*, SUNY Binghamton, Oct 2019

On the Steele-Zhang conjecture in first-passage percolation

- *AMS Sectional*, SUNY Binghamton, Oct 2019

Stationary coalescing walks

- *Probability Seminar*, Courant Institute (NYU), Mar 2020
- *Probability Seminar*, Georgia Tech, Feb 2019
- *Probability Seminar*, Carnegie Mellon, Oct 2018.
- *Probability Seminar*, University of Minnesota, Sep 2018.
- *Probability Seminar*, Temple University, Sep 2018.
- *AMS Sectional Meeting*, Boston University, April 2018.
- *Probability Seminar*, Northwestern University, Feb 2018.
- *Probability Seminar*, University of Connecticut, Sep 2017.
- *Random Structures in Statistical Mechanics and Mathematical Physics*, C.I.R.M Luminy, Mar-Apr 2017.

Fluctuations of polymer models in intermediate disorder

- *Special Session on Probability, AMS Spring Sectional*, Fargo, ND, Apr 2016.
- *Special Session on Probability, Combinatorics and Statistical Mechanics, III of the AMS Fall Eastern Sectional Meeting*, Rutgers University, November 2015.
- *PDE and Probability Seminar*, University of British Columbia, May 2015.
- *Probability Seminar*, University of Illinois at Urbana-Champaign, March 2015.

Stochastic Homogenization and First-Passage Percolation

- *Special Seminar*, Temple University, Dec 2016.
- *Special Seminar*, Penn State University, Feb 2016.
- *Special Seminar*, Carnegie Mellon University, Jan 2016.
- *Statistical Science Seminar*, University College London, August 2015.
- *Arbeitsgemeinschaft ANGEWANDTE ANALYSIS*, Max Planck Institute, Leipzig, April 2015.

A stochastic homogenization approach to first-passage percolation

- *Fall Semester Postdoctoral Seminar*, Fields Institute, October 2014.

Variational formula for the time-constant of first-passage percolation

- *Probability Seminar*, University of Wisconsin-Madison, December 2014.
- Invited talk, *Workshop on First-Passage Percolation*, Instituto Nacional de Matemática Pura e Aplicada, November 2014.
- *Mathematical Finance and Probability Seminar*, Rutgers University, October 2014.
- Contributed talk, *37th Conference on Stochastic Processes and their Applications*, Universidad de Buenos Aires, July 2014.

Variational Formula for the Limit Shape of First-Passage Percolation

- *Frontier Probability Days*, University of Arizona, May 2014.
- *ZiF Summer School*, Bielefeld University, August 2013.
- *9th Cornell Probability Summer School*, Cornell University, July 2013.
- *Graduate Student Seminar*, NYU Courant Institute, April 2013.

Renewal-Reward Processes and Single-Molecule Experiments on Motor Proteins

- *Mostly Biomathematics Lunchtime Seminar*, NYU Courant Institute, November 2009.

Academic Service

Organizer

University of Rochester, Department of Mathematics

- (co-organizer) Colloquium 2018–Present
- (co-organizer) Wing Lectures 2018–Present
- (co-organizer) Probability, Ergodic Theory, Mathematical Physics Seminar 2017–Present

University of Utah, Department of Mathematics

- (with Tom Alberts) Stochastics Seminars 2015–2017

New York University, Courant Institute of Mathematics

- Graduate Student/Postdoc Seminar Series 2012–2014

Professional Service

Organizer

AMS Spring Western Sectional Meeting

- (with Tom Alberts) Special Session on Topics in Probability April 2016

Professional Memberships

American Mathematical Society (AMS) 2010–Present