

# Sunder Sethuraman

Brief Vitæ

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## Education

1995 Ph.D. Courant Institute, New York University, New York, NY.  
1990 B.S. Stanford University, Stanford, CA.  
1986 Diploma Florida High School, Tallahassee, FL.

## Professional Experience

2011 –	Professor	Department of Mathematics University of Arizona.
2024 – 2025	Acting Associate Head of Postdoc Program	–
2008 – 2011	Professor	Department of Mathematics Iowa State University.
2002 – 2008	Associate Professor	–
1998 – 2002	Assistant Professor	–
1996 – 1998	Visiting Assistant Professor	School of Mathematics University of Minnesota.
1995 – 1996	Post-Doctoral Fellow	FIM, ETH-Zentrum Zürich, Switzerland.

## Research Areas of Interest

Mostly probability, and connections to analysis, mathematical physics, and statistics: Stochastic analysis of interacting particle systems. Random walks, random graphs, and random media. Stick-breaking measures, data clustering and stochastic optimization.

*Member:* Statistics & Data Science, and Applied Math graduate interdisciplinary programs at University of Arizona.

## Honors

07/2008	Prix de l’Institut Henri Poincaré for best paper in <i>Ann. IHP Prob. Stat.</i> in 2007
04/2009	Lambert Award, Dept of Mathematics, Iowa State University
01/2018	Simons Foundation Fellowship
05/2018	Fellowship of the Institute of Mathematical Statistics
10/2018	Japan Society for the Promotion of Science Fellowship
01/2025	Simons Foundation Fellowship
6/2025	Schramm lecture, Institute of Mathematical Statistics and Bernoulli Society

## PhD Students

- Zach Dietz. “Large deviations for a class of non-homogeneous Markov chains,” Defended December 2002. Next: NSF-VIGRE post-doc at Tulane University.
- Dimitris Kontogiannis (joint with G. Lieberman). Defended July 2010. “Homogenization of partial differential equations in random media”
- Jihyeok Choi (joint with M. Axenovich), Defended April 2011. “On time-dependent preferential attachment.” Next: Church postdoc at Syracuse University.
- Erik Davis, Defended May 2016, “Consistency of modularity clustering in random geometric graphs.’ Bartlett prize. Next: Postdoc at U. Arizona; Conversant, Chicago, IL; Hughes Research Laboratories, Pasadena, CA.
- Doron Shahar, Defended Spring 2018, “Hydrodynamics for asymmetric long-range interacting particle systems.” Bartlett prize. Next: Basis, New York, NY.
- William Lippitt, Defended Summer 2019, “Stick-breaking processes, clumping, and occupation laws of Markov chains.” Bartlett prize. Next: Postdoc at U. Arizona; Postdoc at U. Colorado, Denver, CO.
- Derick Bishop, ‘The solution of the  $d$ -string optimal stopping problem in certain Bernoulli sequences’, Defended June, 2022. Next: Pima CC, Tucson, AZ.
- Alex Loomis, ‘Higher energy state approximations in the ‘Many Interacting Worlds’ model’, Defended Summer 2024. Next: Qbitsoft.
- Conner Hatton, ‘Multi-range of RW’, and topics in ‘satellite imagery analysis’, Defended December 2024. Next: Postdoc at OakRidge National Laboratory
- Marcel Huidani, Current, topics in interacting particle systems.

### Postdocs mentored

- Jianfei Xue (2017-2020), ‘Hydrodynamic limit of Young diagrams’, ‘Hydrodynamics in Sinai-type random environments’. Next: U. Missouri post-doc; Asst Prof Soochow U. China
- Michael Conroy (2021- 2023), ‘Gumbel laws in symmetric exclusion’. Next: Clemson U. Asst. Prof.

### Other PhD students helped mentor

- Sijia Liu, 2011. ‘Random walk distances in data clustering and applications.’ Next: Capital One.
- Alex Young, 2017. ‘On collision times of self-sorting interacting particles in one-dimension with random initial positions and velocities.’ Next: Postdoc at Duke U.
- Brady Gales, 2021, ‘Norm agnostic linear bandits.’
- Tanner Reese, topics in corner growth models, Current.

### MS Students

- John Njue. (co-major with Paul Sacks), MS Exam October 2003.
- Eric Blabac. “Some results in the determination of the basis of a convergent nonhomogeneous Markov chain,” MS Exam July 2005. Next: Employed at SAP software company.
- Maximilian Wimmer. “A law of large numbers and central limit theorem for the leaves in a random graph model” MS Exam July 2006. Next: PhD student in Finance at University of Regensburg.
- Michael Phyzicky. “The structure of the limit tree in random graphs with super-linear preferential attachment” Oral Exam January 2014. Next: Employed by Chase Bank, Dallas, TX.
- Conner Hatton. ‘From exactly once visited points of random walk to voter models with influencers.’ Defended June, 2022.
- Owen MacDonald. ‘Preferential attachment adjacent weights.’ Defended May, 2022. Next: Messina Group Consulting, Chicago, IL.

### Undergraduate Students

- Jayadev S. Athreya. Senior undergraduate thesis, May 2000, “On the asymptotic limits of discrete maximal order statistics.” Next: Graduate student, Mathematics, University of Chicago.

- Thomas Doehrman. Senior undergraduate thesis, May 2017, “The range of random walks up to the time of exit from a domain.” Harvill Award. Next: PhD student, Mathematics, University of Arizona.
- Lexi Garrabrant, Tristin Solarzano. Undergraduate research poster presented at UBRP conference, Jan 2020, “Records: Assessing change in temperature and other data”. Next: L.G. to Fusion Academy, Scottsdale.
- Saresh Paradkar, Senior undergraduate thesis, May 2023, ‘Stein’s equation and Cramer-Rao lower bounds.’ Next: MS student in data science, Carnegie-Mellon U.

### **Highschool Outreach**

- Ran an online summer 2020 program ‘Math of Neural Networks’ with 7 Tucson area highschool junior students, June 10-July 20, 2020. Funding: HSAP Army Research Office.
- Ran an online summer 2021 program ‘Math Models of Opinions and Epidemics’ (with Shankar Venkataramani) with 5 Tucson highschool students, June 9 - July 19, 2021. Funding: HSAP Army Research Office.

### **Editorial Work**

- Associate Editor of Journal of Theoretical Probability, 1/23 -  
 Associate Editor of Rocky Mountain Mathematics Journal, 6/15 - 1/21  
 Associate Editor of Electronic Journal of Probability, Electronic Communications in Probability, 1/09 - 12/14  
 Associate Editor of Statistics and Probability Letters, 11/02 - 6/2011

### **Recent Conference Organization**

- Frontier Probability Days 2018. May 29-31, 2018, Corvallis, OR (with T. Alberts, D. Khoshnevisan, Y. Kovchegov, F. Rassoul-Agha).  
 Session ‘Scaling limits and interacting particle systems’ at SPA June 11-15, 2018, Gothenberg, Sweden  
 Frontier Probability Days 2020. Dec. 3-5, 2021, Las Vegas, NE (with T. Alberts, L. Chen, Y. Kovchegov, F. Rassoul-Agha).  
 Seminar in Stochastic Processes 2023. Mar 8-11, 2023, Tucson, AZ (local: with S. Choi, I. Fatkullin, T. Kennedy)  
 Session ‘Stochastic analysis and large scale interacting systems’ at AIMS June 1-5, 2023, Wilmington, NC (with D. Hilhorst, B. Xie).

### Recent lectures in Conferences

Approximating geodesics via random points. JMM Spatial Stochastic Models. Denver, Co., Jan 16, 2020.

SPDE hydrodynamic limit in Sinai-type random environments, Bernoulli-IMS One-World Symposium, August 24-31, 2020

On microscopic derivation of a mean-curvature flow. 10th International Conference on Stochastic Analysis and its Applications (ICSAA), Kyoto University, Japan, Sep 6-10, 2021

Boundary behaviors, condensation, and effects of slow sites in zero-range systems, Montreal Workshop Probability and PDE, March, 2022.

On atypical motions of a tagged particle in asymmetric simple exclusion. Probability Conference (in honor of Raghu Varadhan), Seoul National University, South Korea, Jun 13-17, 2022.

On atypical motions of a tagged particle in asymmetric simple exclusion. Probability Conference (in honor of Herbert Spohn), Muenster, Germany, Jun 20-25, 2022.

On asymptotics of a tagged particle in simple exclusion, Topics in High Dimensional Probability, ICTS, Bangalore, India, Jan 2 - 23, 2023.

Atypical behaviors of a tagged particle in ASEP. Workshop on Random Growth Models in honor of Timo Seppäläinen, BIRS, Canada, May 29 - June 3, 2023

Connections between stick-breaking measures and Markov chains. International Indian Statistical Association annual meeting, June 1- 4, 2023, Golden, CO, Colorado School of Mines.

Hydrodynamic limit in a ‘Sinai’-type random environment. AIMS Conference on Dynamical Systems and Differential Equations, June 1-5, 2023, Wilmington, NC.

Mini-course: An introduction to scaling limits in interacting particle systems. Stochastic Methods in Finance and Physics IV, Crete, July 17-21, 2023.

On the motion of a tagged particle in simple exclusion, Conference in honor of Wlodek Bryc and Magda Peligrad, University of Cincinnati, May 1-4, 2024.

Mini-course: Studies around hydrodynamic limits in interacting particle systems. IMPA, June 3-14, 2024

An spde as a hydrodynamic limit in a random environment. Advances in probability theory and interacting particle systems: in honor of SRS Varadhan, Harvard U, August 26-28, 2024

An spde as a hydrodynamic limit in a random environment. Workshop on probability and mathematical physics, Gimhae, Korea Dec 16-19, 2024.

(upcoming) SPA, Wroclaw, Poland July 14-18, 2025