

Ahmed Bou-Rabee

CONTACT INFORMATION

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RESEARCH INTERESTS

Probability and PDEs: the Abelian sandpile, stochastic homogenization, Liouville quantum gravity, percolation, random planar maps, unique continuation

EMPLOYMENT

New York University, New York, NY

NSF Postdoctoral Fellow / Courant Instructor, 2023–

Cornell University, Ithaca, NY

NSF Postdoctoral Fellow, 2022–2023

EDUCATION

University of Chicago, Chicago, Illinois

Ph.D., Statistics, 2022
Advised by Charles K. Smart.

Stanford University, Stanford, California

B.S., Mathematics, minor in Computer Science; M.S., Statistics, 2016

PAPERS

Preprints

11. Random walk on sphere packings and Delaunay triangulations in arbitrary dimension, with Ewain Gwynne.
10. Superdiffusive central limit theorem for a Brownian particle in a critically-correlated incompressible random drift, with Scott Armstrong and Tuomo Kuusi.
9. Unique continuation on planar graphs, with Bill Cooperman and Shirshendu Ganguly.

Publications

8. Harmonic balls in Liouville quantum gravity, with Ewain Gwynne, **Proceedings of the London Mathematical Society**, to appear.
7. Rigidity of harmonic functions on the supercritical percolation cluster, with Bill Cooperman and Paul Dario, **Transactions of the American Mathematical Society**, to appear.
6. Internal DLA on mated-CRT maps, with Ewain Gwynne, **Annals of Probability**, to appear.
5. Integer superharmonic matrices on the F-lattice, **Advances in Mathematics**, 436, 109400 (2024).
4. Hamilton-Jacobi scaling limits of Pareto peeling in 2D, with Peter S. Morfe, **Probability Theory and Related Fields**, 188, 235-307 (2024).
3. A shape theorem for exploding sandpiles, **Annals of Applied Probability**, 34(1A): 714-742 (2024).
2. Dynamic dimensional reduction in the abelian sandpile, **Communications in Mathematical Physics**, 390, 933-958 (2022).
1. Convergence of the random abelian sandpile, **Annals of Probability**, 49(6): 3168-3196 (2021).

AWARDS

2. NSF Mathematical Sciences Postdoctoral Research Fellowship, 2022.
1. Stevanovich Fellow (PhD Thesis Prize), 2022.

INVITED TALKS

2024

UCLA Mathematics Colloquium, *January 9, 2025*
Duke Probability Seminar, *December 5, 2024*
University of Chicago Mathematics Colloquium, *November 18, 2024*
University of Chicago Probability Seminar, *October 4, 2024*
Yale Analysis Seminar, *September 26, 2024*
IMSI, Two-Dimensional Random Geometry, *July 8-12, 2024*
Aalto University, Probabilistic Field Theories, *June 17-19, 2024*
MIT Analysis Seminar, *April 16, 2024*
NYU Probability Seminar, *April 12, 2024*
McGill University Probability Seminar, *March 28, 2024*
The Fields Institute, KPZ meets KPZ, *March 4-8, 2024*
Los Angeles Probability Forum, *February 29, 2024*

2023

University of Hagen, Analysis Seminar, *November 29, 2023*
NYU Analysis Seminar, *November 2, 2023*
AMS 2023 Fall Eastern Sectional Meeting, Special Session, *September 9, 2023*
CIRM, Percolation and interactions, *August 3, 2023*
43rd Conference on Stochastic Processes and their Applications, Invited Session, *July 26, 2023*
Percolation Today, *April 4, 2023*
University of British Columbia Probability Seminar, *March 1, 2023*
University of Victoria Dynamics and Probability Seminar, *February 28, 2023*

2022

Institute for Advanced Study Probability Seminar, *November 2, 2022*
Penn/Temple Probability Seminar, *November 1, 2022*
Cornell Probability Seminar, *October 24, 2022*
Oberwolfach, Universality: Random Matrices, Random Geometry and SPDEs, *June 4, 2022*
Yale Analysis Seminar, *March 3, 2022*
University of Utah Stochastics Seminar, *February 25, 2022*

2021

LU-NU-UMN Joint Probability Seminar, *October 27, 2021*
Bernoulli-IMS, Organized Session, *July 22, 2021*
Stanford Probability Seminar, *May 10, 2021*
UC Berkeley Probability Seminar, *February 10, 2021*

2020

Cornell Math 7710 Guest Lecture, *October 27, 2020*

2019

Cornell Probability Seminar, *September 23, 2019*
CCNY Mathematics Colloquium, *September 19, 2019*

TEACHING

New York University

MATH-UA 325 (Analysis) Lecturer, *Fall 2024*.
MATH-UA 120 (Discrete Mathematics) Lecturer, *Fall 2023, Spring 2024*.

University of Chicago

STAT 33910 (Financial Statistics) Teaching Assistant, *Winter 2020-2022*.
STAT 234 (Statistical Models and Methods) Teaching Assistant, *Spring 2020*.
STAT 25150 (Introduction to Mathematical Probability) Teaching Assistant, *Fall 2019*.
STAT 383 (Measure-Theoretic Probability 2) Teaching Assistant, *Spring 2019*.
STAT 304 (Introduction to Probability Theory) Teaching Assistant, *Spring 2018*.
STAT 312 (Stochastic Processes) Teaching Assistant, *Fall 2017-2021*.

STAT 220 (Statistical Methods And Applications) Teaching Assistant, *Winter-Spring 2016-2017*.

Chinese University of Hong Kong Shenzhen

MAT 1030 (Matrix Methods and Applications) Lecturer, *Summer 2016*.

Stanford

EE 364A (Convex Optimization I) Teaching Assistant, *Winter 2014-2015*.

EE 103 (Matrix Methods and Applications) Teaching Assistant, *Fall 2014-2016*.

SERVICE

5. Reviewer for academic journals
Communications in Mathematical Physics, Communications in Pure and Applied Mathematics, Comptes Rendus de l'Académie des Sciences, Electronic Communications in Probability, Electronic Journal of Probability, Journal of Statistical Physics.
4. Co-organizer, Probability Seminar, Cornell University, *2022-2023*.
3. Co-organizer, Probability Seminar, University of Chicago, *2021-2022*.
2. Volunteer Statistical Consultant, Ministry of Health, Kuwait, *2020-2021*.
1. Student Representative, Department of Statistics, University of Chicago, *2017*.

REFERENCES

- Scott Armstrong
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Courant Institute of Mathematical Sciences
New York University
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- Ewain Gwynne
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Department of Mathematics
University of Chicago
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- Lionel Levine
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- Charles K. Smart
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