Sourav Sarkar

Curriculum Vitae

CONTACT INFORMATION

Office: D2.07
Centre for Mathematical Sciences
Wilberforce Road
Cambridge-CB3 0WB,
UK.

Mobile: +447469436698
E-mail: ss2871@cam.ac.uk,
sourav.sarkar91@gmail.com
Date of birth: 28 April, 1992
Citizenship: Indian.

RESEARCH INTERESTS

My research interests are in probability theory. I am particularly interested in *the random growth models that belong to the KPZ universality class*, *geometric properties of the KPZ fixed point and the relevant processes*, *last passage percolation*, *exclusion processes*, *competitive erosion*, *stable random fields*, *percolation theory*, *Coulomb gas* and *random walks on graphs*.

EMPLOYMENT

I am currently an **Associate Professor** (University Associate Professor of Probability) at the Department of Pure Mathematics and Mathematical Statistics (DPMMS), **University of Cambridge** from July 2024. I am also a Fellow of Trinity Hall.
Prior to this, I was an Assistant Professor at the Department of Pure Mathematics and Mathematical Statistics (DPMMS), **University of Cambridge** from July 2021 to June 2024.
I was a Postdoctoral Fellow at the Department of Mathematics, **University of Toronto** from July 2019 to June 2021.

EDUCATION

I. **Ph.D. in Statistics**, Department of Statistics, University of California, Berkeley. **2015-2019**.
Thesis: Last passage percolation and the Slow bond problem.
Advisor: Prof. Alan Hammond.

II. **Master of Statistics (M. Stat.)**, *Indian Statistical Institute, Kolkata*, **2013-2015**.

1. Total Percentage Score: 95.1% (*First Division with Distinction, class topper*).
2. Specialization: Mathematical Statistics and Probability.

III. **Bachelor of Statistics (B. Stat.) (Hons.)**, *Indian Statistical Institute, Kolkata*, **2010-2013**.

1. Total Percentage Score: 93.1% (*First Division with Distinction, class topper*)

ACADEMIC ACHIEVEMENTS, AWARDS AND HONOURS

- **The Outstanding Graduate Student Instructor Award** for excellence in teaching by a graduate student at University of California, Berkeley, in 2019.
- **The Michel and Line Loève Fellowship**, Department of Statistics, University of California, Berkeley, 2015-17.
- **ISIAA-Mrs. M.R. Iyer Memorial Gold Medal**, for outstanding performance in M.Stat., January 2016.
- **Debesh-Kamal Scholarship for Higher Studies Abroad**, Ramakrishna Mission Institute of Culture, India, 2015.
- **ISIAA-Mrs. M.R. Iyer Memorial Gold Medal**, for outstanding performance in B.Stat. (Hons.) undertaken during 2010-2013, January 2014, awarded by the Hon'ble President of India.
- **D. Basu Memorial Gold Medal** for outstanding presentation as well as best performance in B.Stat. (Hons.) Programme 2010-2013, Januray 2014, awarded by the Hon'ble President of India.
- **Nikhilesh Bhattacharya Memorial Gold Medal** for the best performance in Statistics in B.Stat. (Hons.) Programme 2010-2013, January 2014, awarded by the Hon'ble President of India.
- Awarded the **Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship** by the Department of Science and Technology (DST), Government of India, 2009-15.

- Successful in **Indian National Mathematical Olympiad (INMO)**, 2008 and attended the **International Mathematical Olympiad Training Camp (IMOTC)** conducted by the National Board for Higher Mathematics (NBHM) in 2008 and 2009.

Preprints and Publications

1. **Quantitative Brownian regularity of the KPZ fixed point with meagre initial data**-with Pantelis Tassopoulos. Available at https://arxiv.org/pdf/2509.19415.
2. **Radon-Nikodym derivative of inhomogeneous Brownian last passage percolation**-with Pantelis Tassopoulos. Available at https://arxiv.org/pdf/2509.19414.
3. **Mixing properties of stable random fields indexed by amenable and hyperbolic groups** -with Mahan Mj and Parthanil Roy. Available at https://arxiv.org/abs/2205.15849.
4. **Infinite order phase transition in the slow bond TASEP**.-with Allan Sly and Lingfu Zhang. **Communications on Pure and Applied Mathematics**, 77(6):3107–3140, 2024. Also available at https://arxiv.org/abs/2109.04563.
5. **Three-halves variation of geodesics in the directed landscape**.-with Duncan Dauvergne and Bálint Virág. **Annals of Probability**, 50 (2022), no. 5, 1947–1985. Also available at https://arxiv.org/abs/2010.12994.
6. **Brownian absolute continuity of the KPZ fixed point with arbitrary initial condition**.-with Bálint Virág. **Annals of Probability**, 49 (2021), no. 4, 1718–1737. Also available at https://arxiv.org/pdf/2002.08496.
7. **Ground states and hyperuniformity of the hierarchical Coulomb gas in all dimensions**.-with Shirshendu Ganguly. **Probab. Theory Related Fields**, 177(3-4):621-675, 2020. Also available at https://arxiv.org/abs/1904.05321.
8. **Stability of collision property of a graph**.-with Omer Angel and Yuval Peres. (Draft available on request).
9. **A note on the local weak limit of a sequence of expander graphs**. **Electron. Commun. Probab.**, 26 (2021), Paper No. 32. Also available at https://arxiv.org/abs/1808.09073.
10. **Modulus of continuity for fluctuations and weight profiles in Poissonian last passage percolation**.-with Alan Hammond. **Electron. J. Probab.**, 25:Paper No. 29, 38, 2020. Also available at https://arxiv.org/abs/1804.07843.
11. **Last Passage Percolation and the Slow Bond Problem**. ProQuest LLC, Ann Arbor, MI, 2019. Thesis (Ph.D.)–University of California, Berkeley. Also available at https://www.math.toronto.edu/ssarkar/thesis.pdf.
12. **Formation of large-scale random structure by competitive erosion**. - with Shirshendu Ganguly and Lionel Levine. **Annals of Probability**, 47(6):3649-3704, 2019. Also available at https://arxiv.org/abs/1711.11028.
13. **Invariant measures for TASEP with a slow bond**. - with Riddhipratim Basu and Allan Sly. Available at https://arxiv.org/abs/1704.07799.
14. **Coalescence of geodesics in exactly solvable models of last passage percolation**. - with Riddhipratim Basu and Allan Sly. **J. Math. Phys.**, 60(9): 093301, 22, 2019. Also available at https://arxiv.org/abs/1704.05219.
15. **A relative anti-concentration inequality**. - with Manjunath Krishnapur. Available at https://arxiv.org/abs/1612.09045.
16. **Stable random fields indexed by finitely generated free groups**. -with Parthanil Roy. **Annals of Probability**, 2018, Vol. 46, No. 5, 2680-2714. Also available at https://arxiv.org/abs/1608.03887.

Invited Talks

- **IIT Bombay Probability Seminar**, IIT Bombay, Mumbai, India, November 2025.
- **KCL Probability Seminar**, King's College London, May 2025.
- **Bristol Probability Seminar**, University of Bristol, March 2025.
- **ISI Bangalore Probability Seminar 2023**, ISI Bangalore, September 2023.
- **Warwick Statistical Mechanics Seminar 2023**, University of Warwick, June 2023.
- **British Mathematical Colloquium 2023**, University of Bath, April 2023.
- **Durham University Probability Seminar**, Durham University, October 2022.
- **2022 IMS Annual Conference**, London, June 2022.
- **Oxford Probability Seminar**, University of Oxford, June 2022.
- **University of Bonn Stochastic Seminar**, University of Bon, June 2022.
- **Infosys Chandrasekharan Random Geometry Colloquium - TIFR**, TIFR Mumbai, April 2022.
- **Imperial College Stochastic Analysis Seminar**, Imperial College London, November 2021.
- **Stanford Applied Math and Probability Seminar**, Stanford University, March 2021.
- **University of Victoria Math Seminar**, University of Victoria, March 2021.
- **Chicago Probability Seminar**, University of Chicago, February 2021.
- **Warwick Probability Seminar**, University of Warwick, February 2021.
- **North British Probability Seminar**, University of Edinburgh, November 2020.
- **Bernoulli-IMS One World Symposium** August 2020.
- **Integrable Probability Mini-workshop,** Online Open Probability School, June 2020.
- **UCLA Probability Seminar,** University of California Los Angeles, April 2019.
- **UToronto Probability Seminar,** University of Toronto, February 2019.
- **UC Davis Probability Seminar,** University of California Davis, November 2018.
- **Columbia Probability Seminar,** Columbia University, June 2018.
- **Cornell Probability Seminar**, Cornell University, March 2018.
- **UC Berkeley Probability Seminar,** University of California Berkeley, March 2018.
- **Stanford Probability Seminar**, Stanford University, February 2018.
- **Indo-Russian Meeting in Probability and Statistics**, Bangalore, India, January 2018.
- **PIMS Summer School 2017**, University of British Columbia, June 2017.
- **Bangalore Probability Seminar**, IISc, Bangalore, India, January 2017.
- **Probability Seminar**, ISI Kolkata, India, December 2016.
- **Bangalore Probability Seminar**, IISc, Bangalore, India, July 2015.
- **Prasanta Chandra Mahalanobis Memorial Lecture**, ISI Kolkata, India, July 2015.
- **D.Basu Memorial Lecture**, ISI Kolkata, India, December 2013.

Research Visits

- **Microsoft Research, Redmond,** November 2018, **Columbia University** June 2018, visited Prof. Ivan Corwin, **Princeton University** March 2018, visited Prof. Allan Sly, **Microsoft Research, Redmond**, October 2017, **Princeton University** September 2017, visited Prof. Allan Sly.

Teaching Experience

At University of Cambridge I have lectured the following courses:

- Lent 2024: Applied Probability (Part II)
- Michaelmas 2023: Probability and Measure (Part II)
- Lent 2023: Applied Probability (Part II)
- Lent 2022: Stochastic Analysis (Part III)

I regularly hold weekly supervisions for undergraduate students of Trinity Hall and Trinity College for a number of first and second-year courses in probability and statistics (Part IA Probability, Part IB Markov Chains, Part IB Statistics).
At University of Toronto, I have taught MAT 137 Calculus (Fall-Winter 2020-2021, Summer 2020 and Fall-Winter 2019-2020). At UC Berkeley, I have been a Graduate Student Instructor for a number of graduate and undergraduate courses.

I received the **Outstanding Graduate Student Instructor Award** in 2019.
I have received uniformly high appreciation and positive feedback from the students at Cambridge, Toronto and Berkeley.

Research supervision

- I have a PhD student, Pantelis Tassopoulos, from Michaelmas 2024.
- I have supervised two Part II students, Lorca Heeney-Brockett and Toby Cole in the Summer 2023 under the Summer Research in Maths (SRIM) programme, where we worked on a research problem.
- I had a postdoc, Scott Mason, from August 2023 to June 2024.
- I have supervised a number of Part III essays.

Professional/ Administrative activities

I organized the conference "Phase Transitions and Correlated Random Processes" at the Isaac Newton Institute through the CCIMI programme in May 2023.

I have been the Part III subject advisor in Probability for 2021-22 and 2023-24.

I am an associate editor of *Sankhya A* and *Sankhya B*, Journals of the Indian Statistical Institute.

I have served as an examiner for Part II and Part IA. I have served as an internal examiner for a number of PhD students. I am a co-organizer of the Probability seminar at Cambridge. I hold interviews for undergraduate and postgraduate admissions, and have served in a number of committees in the College and the Department.

I am a reviewer for *zbMATH* and *AMS Mathematical Reviews*, and regularly review articles for all major probability journals including Probability Theory and Related Fields, Annals of Probability and Communications in Mathematical Physics.

References

- Prof. Alan Hammond
  Departments of Mathematics and Statistics,
  University of California at Berkeley.
  Email: alanmh@stat.berkeley.edu
- Prof. Allan Sly
  Department of Mathematics,
  Princeton University.
  Email: asly@princeton.edu

- Prof. Jeremy Quastel
  Department of Mathematics and Statistics,
  University of Toronto.
  Email: quastel@math.toronto.edu

- Prof. Bálint Virág
  Department of Mathematics and Statistics,
  University of Toronto.
  Email: balint@math.toronto.edu