

Sayan Das

Employment

- 2026– **Assistant Professor**, *Department of Mathematics*, Vanderbilt University, Nashville.
2023–2026 **L.E. Dickson Instructor**, *Department of Mathematics*, University of Chicago, Illinois.
–Mentor: [Ewain Gwynne](#).

Education

- 2018–2023 **Ph.D. in Mathematics**, *Columbia University*, New York.
–Advisor: [Ivan Corwin](#).
2016–2018 **Master of Statistics (M.Stat)**, *Indian Statistical Institute*, Kolkata.
2013–2016 **Bachelor of Statistics (B.Stat (Hons.))**, *Indian Statistical Institute*, Kolkata.

Research Interests

Directed Polymers, Large Deviations, Integrable Probability, Stochastic Partial Differential Equations, Permutations.

Preprints

26. **Invariant measures for half-space geometric LPP: classification and the one force–one solution principle**, *Sayan Das, Evan Sorensen, and Zongrui Yang*, Submitted, [[arXiv](#)].
25. **Pinning in non-critical half-space geometric last passage percolation**, *Sayan Das, Evgeni Dimitrov, and Zongrui Yang*, Submitted, [[arXiv](#)].
24. **Fluctuation exponents of the open KPZ equation in the maximal current phase**, *Andres A. Contreras Hip, Sayan Das, and Antonios Zitridis*, Submitted, [[arXiv](#)].
23. **The half-space KPZ line ensemble and its scaling limit**, *Sayan Das and Christian Serio*, Submitted, [[arXiv](#)].
22. **Solving marginals of the LDP for the directed landscape**, *Sayan Das and Li-Cheng Tsai*, Submitted, [[arXiv](#)].

Publications

21. **Upper tail large deviations of the directed landscape**, *Sayan Das, Duncan Dauvergne, and Bálint Virág*, To appear in *Duke Mathematical Journal*, [[arXiv](#)].
20. **Lower tail large deviations of the stochastic six vertex model**, *Sayan Das, Yuchen Liao, and Matteo Mucciconi*, To appear in *International Mathematics Research Notices*, [[arXiv](#)][[Journal](#)].
19. **Convergence to stationary measures for the half-space log-gamma polymer**, *Sayan Das and Christian Serio*, *Journal of Functional Analysis* Vol. 289, No. 4, Aug 2025, [[arXiv](#)][[Journal](#)].
18. **Temporal Increments of the KPZ equation with general initial data**, *Sayan Das*, *Electron. J. Probab.* 29: 1–28 (2024), [[arXiv](#)][[Journal](#)].
17. **Multiplicative SHE limit of random walks in space–time random environments**, *Sayan Das, Hindy Drillick, and Shalin Parekh*, *Probab. Theory Relat. Fields* (2024)., [[arXiv](#)][[Journal](#)].
16. **Localization of the continuum directed random polymer**, *Sayan Das and Weitao Zhu*, *Probab. Theory Relat. Fields* (2024)., [[arXiv](#)][[Journal](#)].
15. **The half-space log-gamma polymer in the bound phase**, *Sayan Das and Weitao Zhu*, *Communications in Mathematical Physics* 405, no. 8 (2024): 1–46., [[arXiv](#)][[Journal](#)].
14. **KPZ exponents for the half-space log-gamma polymer**, *Guillaume Barraquand, Ivan Corwin, and Sayan Das*, *Probab. Theory Relat. Fields* (2024)., [[arXiv](#)][[Journal](#)].

13. **Large deviations for the q -deformed polynuclear growth**, *Sayan Das, Yuchen Liao, and Matteo Mucciconi*, The Annals of Probability, 53(4), 1223-1286., [[arXiv](#)][[Journal](#)].
12. **KPZ equation limit of sticky Brownian motion**, *Sayan Das, Hindy Drillick, and Shalin Parekh*, Journal of Functional Analysis Vol. 287, No. 10, Nov 2024, [[arXiv](#)][[Journal](#)].
11. **Long and short time laws of iterated logarithms for the KPZ fixed point**, *Sayan Das, Promit Ghosal, and Yier Lin*, Electronic Journal of Probability, 29, 1-38., [[arXiv](#)][[Journal](#)].
10. **Fluctuations of Quadratic Chaos**, *Bhaswar B. Bhattacharya, Sayan Das, Somabha Mukherjee, and Sumit Mukherjee*, Communications in Mathematical Physics, 405(10), 237., [[arXiv](#)][[Journal](#)].
9. **Large deviation principle for random permutations**, *Jacopo Borga, Sayan Das, Sumit Mukherjee, and Peter Winkler*, International Mathematics Research Notices, Volume 2024, Issue 3, February 2024, Pages 2138–2191, [[arXiv](#)][[Journal](#)].
8. **A fourth moment phenomenon for asymptotic normality of monochromatic subgraphs**, *Sayan Das, Zoe Himwich and Nitya Mani*, Random Structures & Algorithms 63.4 (2023): 968-996., [[arXiv](#)][[Journal](#)].
7. **Short- and long-time path tightness of the continuum directed random polymer**, *Sayan Das and Weitao Zhu*, Ann. Inst. H. Poincaré Probab. Statist. 60(1): 343-372, Feb 2024, [[arXiv](#)][[Journal](#)].
6. **Law of iterated logarithms and fractal properties of the KPZ equation**, *Sayan Das and Promit Ghosal*, Ann. Probab. 51(3): 930-986 (May 2023), [[arXiv](#)][[Journal](#)].
5. **Large Deviations for Discrete β -ensembles**, *Sayan Das and Evgeni Dimitrov*, Journal of Functional Analysis Vol 283, Issue 1, [[arXiv](#)][[Journal](#)].
4. **Motif estimation in large graphs: The fourth moment phenomenon**, *Bhaswar B. Bhattacharya, Sayan Das, and Sumit Mukherjee*, Ann. Statist. 50(2): 987-1011, [[arXiv](#)][[Journal](#)].
3. **Upper-tail Large Deviation Principle for ASEP**, *Sayan Das and Weitao Zhu*, Electron. J. Probab. 27: 1-34 (2022), [[arXiv](#)][[Journal](#)].
2. **Fractional moments of the Stochastic Heat Equation**, *Sayan Das and Li-Cheng Tsai*, Ann. Inst. H. Poincaré Probab. Statist. 57 (2) 778-799, May 2021, [[arXiv](#)][[Journal](#)].
1. **Extremal process of the zero-average Gaussian free field for $d \geq 3$** , *Sayan Das, and Rajat Subhra Hazra*, Statistics & Probability Letters, 146, pp.42-49, [[arXiv](#)][[Journal](#)].

Invited Talks

- Jul 2026 **Coin Flippers Conference 2026**, *Newark, Delaware.*
- May 2026 **CMO-BIRS Workshop: Recent Developments in Stochastic Analysis**, *Oaxaca, Mexico.*
- Apr 2026 **Brin MRC workshop: The Kardar-Parisi-Zhang Universality Class & Related Topics**, *University of Maryland, Baltimore, MD.*
- Feb 2026 **IIT Madras Math Colloquium**, *Chennai, India.*
- Jan 2026 **University of Pennsylvania Stat Colloquium**, *Philadelphia, PA.*
- Jan 2026 **Stony Brook University Math Colloquium**, *Long Island, NY.*
- Dec 2025 **Academia Sinica Math Colloquium**, *Taipei, Taiwan.*
- Nov 2025 **Florida State University Stat Colloquium**, *Tallahassee, Florida.*
- Nov 2025 **Vanderbilt Math Colloquium**, *Nashville, Tennessee.*
- Oct 2025 **Emerging Synergies between Stochastic Analysis and Statistical Mechanics**, *BIRS, Canada.*
- Sep 2025 **Columbia University**, *New York.*
- Sep 2025 **Ohio State University**, *Columbus, Ohio.*
- Sep 2025 **University of Michigan**.
- Aug 2025 **Frontiers in Stochastic Analysis Conference**, *Purdue.*
- Jul 2025 **Invited session on Random Growth and KPZ Universality at Stochastic Processes and their Applications Conference**, *Wrocław, Poland.*
- Dec 2024 **Los Angeles Probability Forum**.
- Sep 2024 **Purdue Probability Seminar**.
- Sep 2024 **University of Toronto Probability Seminar**.
- Sep 2024 **University of British Columbia**.
- Apr 2024 **Lehigh-Minnesota joint probability seminar**, *Online.*

Mar 2024 **University of Utah Stochastic Seminar.**
 Mar 2024 **Penn / Temple Probability Seminar.**
 Jan 2024 **Northwestern University Probability Seminar.**
 Jan 2024 **Joint Mathematics Meetings, Special Session on Large Random Permutations, San Francisco.**
 Nov 2023 **University of Michigan.**
 Oct 2023 **University of Illinois Chicago.**
 Aug 2023 **National University of Singapore Probability Seminar.**
 Aug 2023 **Random Matrix days, Indian Statistical Institute.**
 Apr 2023 **University of Chicago Probability Seminar.**
 Jan 2023 **University of North Carolina Probability Seminar.**
 Dec 2022 **UC Berkeley Probability Seminar.**
 Dec 2022 **Stanford Probability Seminar.**
 Nov 2022 **MIT Probability Seminar.**
 Nov 2022 **University of Chicago Probability Seminar.**
 Oct 2022 **KTH Random Matrix Theory Seminar, Online.**
 Oct 2022 **Cornell University Probability Seminar.**
 Sep 2022 **University of Toronto Probability Seminar.**
 May 2022 **Probability and the City Seminar, Online.**
 Mar 2022 **UC Berkeley Probability Seminar, Online.**
 Mar 2022 **University of Wisconsin-Madison Probability Seminar.**
 Mar 2022 **University of Utah Stochastic Seminar.**
 Mar 2022 **Columbia Integrable Probability Seminar, Online.**
 May 2021 **Columbia Princeton Probability Day 2021 (Short Talk), Online.**
 Feb 2021 **Columbia Integrable Probability Seminar, Online.**

Contributed Talks

Sep 2022 **Graduate Student Probability Conference, University of Wisconsin-Madison.**
 Jun 2022 **Summer School in Probability, University of British Columbia, Vancouver.**
 Oct 2021 **Program Associates Short Talk, MSRI, Berkeley.**
 Nov 2020 **North East Probability Seminar 2020, Online.**
 Aug 2020 **Bernoulli-IMS One World Symposium 2020, Online.**

Teaching and Teaching Assistantships

Instructor

Fall 2026 **Probability (undergraduate level), Vanderbilt University.**
 Spring 2026 **Mathematical Methods in the Physical Sciences II, University of Chicago.**
 Winter 2026 **Probability and Stochastic Processes I (for Financial math masters), University of Chicago.**
 Fall 2025 **Mathematical Methods in the Physical Sciences I (2 sections), University of Chicago.**
 Winter 2025 **Mathematical Methods in the Physical Sciences I (2 sections), University of Chicago.**
 Fall 2024 **Mathematical Methods in the Physical Sciences I (2 sections), University of Chicago.**
 Winter 2024 **Mathematical Methods in the Physical Sciences I (2 sections), University of Chicago.**
 Fall 2023 **Mathematical Methods in the Physical Sciences II (2 sections), University of Chicago.**
 Spring 2021 **Calculus I, Columbia University.**
 Summer 2020 **Calculus III, Columbia University.**

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Fall 2022 **Intro to Honors Mathematics, Columbia University.**
 Spring 2022 **Undergraduate Probability, Columbia University.**
 Fall 2020 **Calculus II, Columbia University.**
 Spring 2020 **Honors Math II, Columbia University.**

Fall 2019 **Analysis and Probability I**, *Columbia University*.

Awards and Honours

- 2025 **Winner of Stochastic Process and Applications Travel Awards**, *sponsored by Elsevier*.
- 2021-22 **Peter and Catherine Klein Fellowship**, *for academic qualifications and contributions*, Columbia University, New York.
- 2021 **Stephen Della Pietra Program Associate Fellowship**, MSRI, Berkeley.
- 2021 **Winner of Student Paper Competition**, *Statistical theory and methodology section*, International Indian Statistical Association Conference, 2021.
- 2020-21 **Peter and Catherine Klein Fellowship**, *for academic qualifications and contributions*, Columbia University, New York.
- 2019-20 **Carl B. Boyer Memorial Fellowship**, *for academic qualifications and contributions*, Columbia University, New York.
- 2018 **PCM Memorial Award**, *for academic performance in M.Stat Programme*, Indian Statistical Institute, Kolkata.
- 2017 **D.Basu Memorial Award**, *for academic performance in B.Stat Programme*, Indian Statistical Institute, Kolkata.
- 2013-2018 **INSPIRE Scholarship**, *Department of Science and Technology*, Govt. of India.

Mentorship

- Summer 2025 **Mentor in 'UChicago Math REU'**.
-Students: Xiaoxian Chen (UCLA)
- Spring 2025 **Mentor in a quarter-long Reading/Research Course**.
-Student: Aaron Ho (UChicago)
- Summer 2024 **Mentor in 'UChicago Math REU'**.
-Students: Shreyas Iyer (UChicago), Matthew Lys (UChicago)
- Winter 2024 **Mentor in 'Association for Women in Mathematics (AWM) Mentor Network'**.
-Student: Ashna Jain (UMass Amherst)
- Fall 2020 **Mentor in 'Twoples'**, *A Directed Reading Program for Math Undergraduates*.
-Student: Duncan Haystead (UC Berkeley)
-Project Title: The Moment Problem
- Fall 2020 **Mentor in Columbia Directed Reading Program**.
-Student: Adiba Ejaz (Columbia)
-Project Title: Cover Time of a graph

Services

Organizer

- 2023-26 **Co-organizer of UChicago Probability and Mathematical Physics Seminar**.
- 2020-21 **Co-organizer of Junior Integrable Probability Seminar**.
- 2020 **Organizer of Student Probability Seminar at Columbia**, *Spring 2020 - Fall 2020*.

Refereeing

Annals of Probability, *Annales de l'Institut Henri Poincaré (B) Probabilités et Statistiques*, *Electronic Journal of Probability* (2), *Communications in Mathematical Physics* (2), *Annals of Applied Probability*, *Duke Mathematical Journal*, *Journal of Statistical Physics*, *Random Structures & Algorithms*, *Publications mathématiques de l'IHÉS*, *Transactions of American mathematical society*.

Languages

Bengali (Native), Hindi (Fluent), English (Fluent), Mandarin (Basic).

References

Ivan Corwin

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