Milind Hegde

math.columbia.edu/~milind • *milind.hegde@ntu.edu.sg*

Employment

October 2025 –	Nanyang Technological University, Singapore. Nanyang Assistant Professor (tenure-track).
Spring 2022 – August 2025	Columbia University, New York, NY. Joseph F. Ritt Assistant Professor (Spring 2022). Postdoctoral Research Scientist (Summer 2022–August 2025).
Fall 2021	Mathematical Sciences Research Institute, Berkeley, CA. Gamelin Endowed Postdoctoral Fellow at the programme *Universality and Integrability in Random Matrix Theory and Interacting Particle Systems.*

Education

2016 – 2021	Ph.D., Mathematics, *University of California, Berkeley*. Advised by Alan Hammond & Shirshendu Ganguly.
2012 – 2016	Bachelor of Science, *Indian Institute of Science*, Bangalore. Major in Mathematics.

Research Interests

Probability theory, specifically stochastic growth models and Kardar-Parisi-Zhang universality, with a focus on Gibbsian line ensembles, last passage percolation, and integrable or exactly solvable models.

Grants & Honors

- Nanyang Assistant Professorship, 2025 – 2029, Nanyang Technological University.
- NSF Award DMS-2348156, 2024 – 2027, National Science Foundation.
- US Junior Oberwolfach Fellow, October 2024, Mixing Times in the Kardar-Parisi-Zhang Universality Class.
- Friedman Memorial Prize in Applied Mathematics, 2020, UC Berkeley Mathematics Department.
- Richman Fellowship, 2019 – 2020 academic year, UC Berkeley Mathematics Department.

Publications

1. *The lower tail of q-pushTASEP*.
   With Ivan Corwin. *Comm. Math. Phys., 405, no. 3, 64 (2024)*.
2. *Brownian structure in the KPZ fixed point*.
   With Jacob Calvert and Alan Hammond. *Astérisque, vol. 441 (2023)*.
3. *Local and global comparisons of the Airy difference profile to Brownian local time*.
   With Shirshendu Ganguly. *Ann. Inst. H. Poincaré Probab. Statist., 59, no. 3, 1342–1374 (2023)*.
4. *Optimal tail exponents in general last passage percolation via bootstrapping & geodesic geometry*.
   With Shirshendu Ganguly. *Probab. Theory Relat. Fields, 186, no. 1–2, 221–284 (2023)*.
5. *Exceptional times when the KPZ fixed point violates Johansson's conjecture on maximizer uniqueness*.
   With Ivan Corwin, Alan Hammond, and Konstantin Matetski. *Electron. J. Probab., 28, no. 11, 1–81 (2023)*.

Last updated October 24, 2025.

6. *Interlacing and scaling exponents for the geodesic watermelon in last passage percolation*.
With Riddhipratim Basu, Shirshendu Ganguly, and Alan Hammond. *Comm. Math. Phys., 393, no. 3, 1241–1309 (2022)*.
7. *Lower Deviations in β-ensembles and Law of Iterated Logarithm in Last Passage Percolation*.
With Riddhipratim Basu, Shirshendu Ganguly, and Manjunath Krishnapur. *Israel J. Math., 242, no. 1, 291–324 (2021)*.
8. *Critical point for infinite cycles in a random loop model on trees*.
With Alan Hammond. *Ann. Appl. Probab., 29, no. 4, 2067–2088 (2019)*.

Preprints

9. *Scaling limit and tail bounds for a random walk model of SOS level lines*.
With Yujin H. Kim and Christian Serio. *arXiv:2502.10384*.
10. *KPZ fixed point convergence of the ASEP and stochastic six-vertex models*.
With Amol Aggarwal and Ivan Corwin. *arXiv:2412.18117*.
11. *Large deviation principle for the stationary measures of open asymmetric simple exclusion processes*.
With Zongrui Yang. *arXiv:2412.12026*.
12. *Scaling limit of the colored ASEP and stochastic six-vertex models*.
With Amol Aggarwal and Ivan Corwin. *arXiv:2403.01341*.
13. *Brownian bridge limit of path measures in the upper tail of KPZ models*.
With Shirshendu Ganguly and Lingfu Zhang. *arXiv:2311.12009*.
14. *Sharp upper tail behavior of line ensembles via the tangent method*.
With Shirshendu Ganguly. *arXiv:2208.08922*.

Expository Writing

15. *Fractal structure in the directed landscape*.
With Shirshendu Ganguly. *Probability and Stochastic Processes: A Volume in Honour of Rajeeva L. Karandikar, 129–147 (2024)*.

Invited Talks

- NTU Singapore Mathematics Colloquium; May 2025.
- All roads to the KPZ universality class; American Institute of Mathematics, Pasadena; March 2025.
- University of British Columbia Mathematics Colloquium; January 2025.
- Indiana University Mathematics Colloquium; December 2024.
- Mixing Times in the Kardar-Parisi-Zhang Universality Class, Oberwolfach; November 2024.
- North Carolina State University Mathematics Colloquium; November 2024.
- Harvard Probability Seminar; October 2024.
- Los Angeles Probability Forum; October 2024.
- University of Washington, Seattle Probability Seminar; October 2024.
- University of British Columbia Probability Seminar; October 2024.
- Analysis and Probability Research Group Seminar, Indian Institute of Science, Bangalore; May 2024.
- KPZ Meets KPZ workshop, Fields Institute, Toronto; March 2024.
- CRM-ISM Probability Seminar, Montreal; February 2024.
- Integrable Systems and Random Matrix Theory Seminar, University of Michigan; November 2023.
- Stochastic Processes and Applications 2023, Lisbon, Portugal; July 2023.

- Random growth models and KPZ universality; BIRS, Banff, Canada; May 2023.
- Columbia-Princeton Probability Day 2023; April 2023.
- MIT Probability Seminar; March 2023.
- University of Wisconsin, Madison Probability Seminar; February 2023.
- KTH Random Matrix Theory Seminar; October 2022.
- University of Maryland Probability Seminar; October 2022.
- University of Virginia Probability Seminar; April 2022.
- Temple University/University of Pennsylvania Probability Seminar; April 2022.
- University of Chicago Probability Seminar; April 2022.
- City University of New York Probability Seminar; April 2022.
- Probability in the City (Columbia-NYU Seminar); October 2021.
- University of Utah Stochastics Seminar; October 2021.
- Cornell Probability Seminar; April 2021.
- Stanford Probability Seminar; March 2021.
- Berkeley Probability Seminar; January 2021, August 2020, February 2019.
- Purdue Probability Seminar; September 2020.
- Junior Integrable Probability Seminar; July 2020.
- Open Online Probability School; June 2020.
- Bangalore Probability Seminar; January 2020, January 2019.

Contributed Talks

- One World Symposium, August 2020.

Conferences & Summer Schools Attended

- Emerging Synergies between Stochastic Analysis and Statistical Mechanics; BIRS, Banff; (October 2025)
- All roads to the KPZ universality class; American Institute of Mathematics, Pasadena; March 2025.
- Mixing Times in the Kardar-Parisi-Zhang Universality Class; Oberwolfach; November 2024.
- Universality & Integrability in KPZ; Columbia University; March 2024.
- KPZ Meets KPZ; Fields Institute, Toronto; March 2024.
- International Colloquium on randomness, geometry, and dynamics; TIFR, Mumbai; January 2024.
- The Asymmetric Simple Exclusion Process; Stony Brook; October 2023.
- Stochastic Processes and Applications; Lisbon, Portugal; July 2023.
- Simons Symposium on Solvable Lattice Models and Interacting Particle Systems; June 2023.
- Random growth models and KPZ universality; BIRS, Banff, Canada; May 2023.
- Topics in High Dimensional Probability; ICTS Bangalore; January 2023.
- Bernoulli-IMS One World Symposium; online; August 2020.
- Eighth Pacific Rim Conference in Mathematics; online; August 2020.
- Persi Diaconis' 75th Birthday Conference; Stanford University; February 2020.
- MSRI Summer School (Mathematics of Machine Learning); University of Washington; August 2019.
- Cornell Probability Summer School; June 2019.
- Seminar on Stochastic Processes; University of Utah; March 2019.
- Universality in Random Structures; ICTS Bangalore; January 2019.
- PCMI Summer School on Random Matrix Theory; Park City; June 2017.

Service

- Refereed for *Acta Mathematica*; *Annales de l'Institut Henri Poincaré*; *Annals of Probability*; *Astérisque*; *Communications in Mathematical Physics*; *Electronic Journal of Probability*; *International Mathematics Research Notices*; *Journal d'Analyse Mathematique*; *Journal of the American Mathematical Society*; *Mathematical Physics, Analysis and Geometry*; *Probability and Mathematical Physics*; *Probability Theory and Related Fields*; and *Selecta Mathematica*.
- Co-organized initiative to provide financial aid to undergraduates of the Indian Institute of Science to pay US PhD program application fees in 2019, 2020, 2021, 2022, and 2023.
- Served as a jury member for the UAA Academic Research Conference, 2023 (a Turkey-based program for high school students to write a research paper).

At Columbia University:

- Co-organized Probability seminar, Fall 2022 – Spring 2024.
- Co-organized Sonia Kovalevsky Day (math outreach program for young women in middle school), Fall 2023, and helped run the event in Fall 2024.
- Co-organized Probability and the City seminar (joint between Columbia and NYU), Spring 2022 (weekly), as well as Fall 2022, Spring 2023, Fall 2023, and Spring 2024 (now a twice semesterly event).
- Co-organized a KPZ probability workshop at Columbia, May 2023.
- Co-organized Columbia-Princeton Probability Day 2023.
- Co-organized Northeast Probability Seminar in 2021 and 2022.

At UC Berkeley:

- Organized the Probability Student Seminar, Fall 2018 – Spring 2021.
- Served in the math student diversity group, Spring 2017 – 2021.
- Assisted in organizing the *Eighth Pacific Rim Conference in Mathematics*, held online in August 2020, with local organizers Alan Hammond and Fraydoun Rezakhanlou.

Teaching & Mentoring

- Planned and taught two courses in "Monsoon Mathematics 2021", an online summer camp for motivated high school students in India.

At Columbia University:

- Courses taught: Intro to Modern Analysis II (Fall 2022, Fall 2023, and Fall 2024), Honors Probability theory (Spring 2022).
- Mentored four undergraduate students (Stanley Jian, Charles Beck, Harrison Wang, Catherine Lyu) in the Columbia Math Department REU program (Summer 2022).
- Advised, with Ivan Corwin, the undergraduate senior thesis of Shiyang Shen (Fall 2022–Spring 2023).
- Mentored an undergraduate student, James Stephens, on independent research being supervised by Ivan Corwin (Summer 2024).

At UC Berkeley:

- Teaching assistant at for six courses: Concepts of Probability, Intro to PDE, Linear Algebra, Mathematical Methods of Optimization, Mathematics for Biologists (Parts A & B).
- Served as a mentor in the math department's Directed Reading Program for two semesters, meeting with an undergraduate student weekly as they studied an advanced topic.