

# Zijie Zhuang

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## Education

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University of Pennsylvania

2021–2026 (expected)

Ph.D. student in Statistics

Advisors: Jian Ding and Xin Sun

Peking University

2017–2021

B.S. in Mathematics

## Research interests

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Probability theory with focus on statistical mechanics and random geometry.

## Articles

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1. **Three-point connectivity constant for  $q$ -state Potts spin clusters**, with Gefei Cai, Haoyu Liu and Baojun Wu. Preprint, arXiv:2510.05850.
2. **Schramm-Loewner evolution contains a topological Sierpiński carpet when  $\kappa$  is close to 8**, with Haoyu Liu. Preprint, arXiv:2506.09609.
3. **Bounds on the distance exponent for higher-dimensional Liouville first passage percolation**, with Andres A. Contreras Hip. Preprint, arXiv:2504.09141.
4. **Mixing rate exponent of planar Fortuin-Kasteleyn percolation**, with Haoyu Liu and Baojun Wu. Preprint, arXiv:2502.09950.
5. **Percolation of thick points of the log-correlated Gaussian field in high dimensions**, with Jian Ding and Ewain Gwynne. Preprint, arXiv:2410.22075.
6. **Dynamical random field Ising model at zero temperature**, with Jian Ding and Peng Yang. Accepted by *Probability Theory and Related Fields*. arXiv:2410.20457.
7. **The bulk one-arm exponent for the  $CLE_{\kappa'}$  percolations**, with Haoyu Liu, Xin Sun and Pu Yu. Preprint, arXiv:2410.12724.
8. **Backbone exponent and annulus crossing probability for planar percolation**, with Pierre Nolin, Wei Qian and Xin Sun. *Physical Review Letters*, 134(11), p.117101, 2025.
9. **Annulus crossing formulae for critical planar percolation**, with Xin Sun and Shengjing Xu. Preprint, arXiv:2410.04767.
10. **Boundary touching probability and nested-path exponent for non-simple CLE**, with Morris Ang, Xin Sun and Pu Yu. *Annals of Probability*, 53(3) 797–847, 2025.
11. **Tightness of exponential metrics for log-correlated Gaussian fields in arbitrary dimension**, with Jian Ding and Ewain Gwynne. Preprint, arXiv:2310.03996.
12. **Backbone exponent for two-dimensional percolation**, with Pierre Nolin, Wei Qian and Xin Sun. Preprint, arXiv:2309.05050.
13. **Sharp asymptotics for arm probabilities in critical planar percolation**, with Hang Du, Yifan Gao and Xinyi Li. *Communications in Mathematical Physics*, 405(8):Paper No. 182, 51, 2024.
14. **On large deviations and intersection of random interlacements**, with Xinyi Li. *Bernoulli*, 30(3):2102–2126, 2024.
15. **Long range order for random field Ising and Potts models**, with Jian Ding. *Communications on Pure and Applied Mathematics*, 77(1):37–51, 2024.

16. **On the percolative properties of the intersection of two independent interlacements.** *ALEA Lat. Am. J. Probab. Math. Stat.*, 18, 1061-1084 (2021).

## Awards

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| 1. J. Parker Memorial Bursk Prize for Excellence in Research, University of Pennsylvania | 2025 |
| 2. Weiming Scholarship (for Outstanding Undergraduate Researchers), Peking University    | 2021 |

## Teaching

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I am a teaching assistant for STAT 9300 (Probability theory) in Fall 2025 and was in Fall 2022.

I was a undergraduate research mentor for Maxmillian Tjauw in Spring 2022.

## Professional Service

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I have been a reviewer for Ann. Appl. Probab., PMP, Proc. London Math. Soc., Trans. Amer. Math. Soc., and AFST.

## Talks

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| 1. CFT program at Institut Pascal                          | 10/2025 |
| 2. International Conference for Young Chinese Probabilists | 8/2025  |
| 3. PKU Probability Seminar                                 | 6/2025  |
| 4. MIT Probability Seminar                                 | 4/2025  |
| 5. Two-Dimensional Random Geometry Workshop                | 7/2024  |
| 6. UW Madison Probability Seminar                          | 4/2024  |
| 7. KPZ meets KPZ Workshop                                  | 3/2024  |
| 8. UChicago Probability Seminar                            | 2/2024  |
| 9. Percolation Today Webinar                               | 11/2023 |
| 10. BICMR Summer School on Probability                     | 6/2023  |
| 11. Random Geometry and Statistical Physics Workshop       | 10/2022 |
| 12. Penn Local Probability Seminar                         | 4/2022  |
| 13. THU-PKU-BNU Joint Probability Webinar                  | 12/2021 |
| 14. Percolation Today Webinar                              | 10/2021 |

(Last updated: Nov 21, 2025)