

GEFEI CAI

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Beijing International Center for Mathematical Research, Peking University

EDUCATION

Peking University

Graduate Student, Probability and Mathematical Statistics

September 2022–Present

Advisor: Xinyi Li, Xin Sun

Peking University

Undergraduate Student, Mathematics and Applied Mathematics

September 2019–June 2022

AWARDS AND HONORS

Excellent Graduate

Peking University

2022

President's Scholarship

Peking University

2022

Elite Graduate Student Program in Mathematics

Peking University

2023–2027

Zhong Jiaqing Outstanding Paper Award

Chinese Society of Probability
and Statistics

2026

RESEARCH

Research Interests

Probability theory and mathematical physics, particularly Brownian motion, Schramm–Loewner evolutions, statistical mechanics, and conformal field theory.

Published and Accepted Papers

- [1] **Gefei Cai** and Yifan Gao. *Uniqueness of generalized conformal restriction measures and Malliavin–Kontsevich–Suhov measures for $c \in (0, 1]$* . *Annals of Probability*, 54(4):2149–2172, July 2026.
- [2] **Gefei Cai**, Wen-Bo Li, and Tim Mesikepp. *Quasisymmetric geometry of low-dimensional random spaces*. *Advances in Mathematics*, 487, Paper No. 110758, 21 pp., March 2026.
- [3] Morris Ang, **Gefei Cai**, Xin Sun, and Baojun Wu. *Integrability of conformal loop ensemble: Imaginary DOZZ and beyond*. Accepted for publication in the *Journal of the American Mathematical Society*. Available as arXiv:2107.01788v4.
- [4] **Gefei Cai** and Xinyi Li. *On natural measures of SLE- and CLE-related random fractals*. *Annales de l'Institut Henri Poincaré, Probabilités et Statistiques*, 60(4):2297–2327, November 2024.

Preprints

- [5] **Gefei Cai**. *The Brownian loop-catcher*. arXiv:2607.18070.
- [6] Morris Ang, **Gefei Cai**, Jesper Lykke Jacobsen, Rongvoram Nivesvivat, Paul Roux, Xin Sun, and Baojun Wu. *Exact solution of three-point functions in critical loop models*. arXiv:2604.05503.
- [7] **Gefei Cai**. *Boundary four-point connectivities of conformal loop ensembles*. arXiv:2603.28161.
- [8] **Gefei Cai** and Zhuoyan Xie. *Backbone probability of planar Brownian motion*. arXiv:2512.09683.
- [9] **Gefei Cai**, Haoyu Liu, Baojun Wu, and Zijie Zhuang. *Three-point connectivity constant for q -state Potts spin clusters*. arXiv:2510.05850.
- [10] **Gefei Cai**, Xuesong Fu, Xin Sun, and Zhuoyan Xie. *Disconnection probability of Brownian motion on an annulus*. arXiv:2509.14073.

- [11] Morris Ang, **Gefei Cai**, Xin Sun, and Baojun Wu. *SLE loop measure and Liouville quantum gravity*. arXiv:2409.16547.