

Xin Sun

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EDUCATION

Massachusetts Institute of Technology	Cambridge, MA
Ph.D. Mathematics, advised by Scott Sheffield	2017
Peking University	Beijing, China
B.S. Mathematics	2011

EMPLOYMENT

University of Pennsylvania	Philadelphia, PA
Assistant Professor	7/2020-Present
Columbia University	New York, NY
Simons Junior Fellow	7/2017-6/2020

HONORS AND AWARDS

National Science Foundation Career Award: 2046514	2021-2026
Bernoulli Society New Researcher Award	2020
National Science Foundation Standard Grant: DMS-1811092, DMS-2027986	2018-2022
Junior Fellow, Simons Society of Fellows	2017-2020

PUBLICATIONS AND PREPRINTS

1. **Convergence of uniform triangulations under the Cardy embedding**, Nina Holden and Xin Sun. *Acta Mathematica*, accepted.
2. **Percolation on triangulations: a bijective path to Liouville quantum gravity**, Olivier Bernardi, Nina Holden and Xin Sun. *Mem. Amer. Math. Soc.*, accepted.
3. **Natural parametrization of percolation interface and pivotal points**, Nina Holden, Xinyi Li and Xin Sun. *Ann. Inst. Henri Poincaré Probab. Stat.*, accepted.
4. **Minkowski content of Brownian cut points**, Nina Holden, Greg Lawler, Xinyi Li and Xin Sun. *Ann. Inst. Henri Poincaré Probab. Stat.*, accepted.
5. **Mating of trees for random planar maps and Liouville quantum gravity: a survey**, Ewain Gwynne, Nina Holden and Xin Sun. *Panoramas et Synthèses*, accepted.
6. **Liouville dynamical percolation**, Christophe Garban, Nina Holden, Avelio Sepúlveda and Xin Sun. *Probab. Theory Relat. Fields* (2021).
7. **Joint scaling limit of site percolation on random triangulations in the metric and peanosphere sense**, Ewain Gwynne, Nina Holden and Xin Sun. *Electronic Journal of Probability*, Vol. 26, 1-58, (2021).
8. **Mating of trees for critical Liouville quantum gravity**, Juhan Aru, Nina Holden, Ellen Powell and Xin Sun. *ArXiv e-prints*, August 2021.
9. **Integrability of the conformal loop ensemble**, Morris Ang and Xin Sun. *ArXiv e-prints*, June 2021.
10. **FZZ formula of boundary Liouville CFT via conformal welding**, Morris Ang, Guillaume Remy and Xin Sun. *ArXiv e-prints*, April 2021.
11. **Integrability of SLE via conformal welding of random surfaces**, Morris Ang, Nina Holden and Xin Sun. *ArXiv e-prints*, April 2021.

12. **Volume of metric balls in Liouville quantum gravity**, Morris Ang, Hugo Falconet and Xin Sun. *Electronic Journal of Probability*, 25 (2020), no. 169, 1-50.
13. **Scaling limit of large triangulations of polygons**, Marie Albenque, Nina Holden and Xin Sun. *Electronic Journal of Probability*, 25 (2020), no. 135, 1-43.
14. **Weak LQG metrics and Liouville first passage percolation**, Julien Dubédat, Hugo Falconet, Ewain Gwynne, Joshua Pfeffer and Xin Sun. *Probab. Theory Relat. Fields*, Vol. 178, 369–436 (2020).
15. **A mating-of-trees approach for graph distances in random planar maps**, Ewain Gwynne, Nina Holden and Xin Sun. *Probab. Theory Relat. Fields*, Vol. 177, 1043–1102 (2020).
16. **Induced graphs of uniform spanning forests**, Russell Lyons, Yuval Peres, and Xin Sun. *Ann. Inst. Henri Poincaré Probab. Stat.*, Vol. 56, No. 4, 2732-2744 (2020).
17. **Conformal welding of quantum disks**, Morris Ang, Nina Holden and Xin Sun. *ArXiv e-prints*, September 2020.
18. **Probabilistic conformal blocks for Liouville CFT on the torus**, Promit Ghosal, Guillaume Remy, Xin Sun and Yi Sun. *ArXiv e-prints*, March 2020.
19. **Four-dimensional loop-erased random walk**, Gregory Lawler, Xin Sun and Wei Wu. *Annals of Probability*, Vol. 47, No. 6, 3866-3910 (2019).
20. **A distance exponent for Liouville quantum gravity**, Ewain Gwynne, Nina Holden and Xin Sun. *Probab. Theory Relat. Fields*, Vol. 173, 931-997 (2019).
21. **Occupation measure of random walks and wired spanning forests in balls of Cayley graphs**, Russell Lyons, Yuval Peres, Xin Sun and Tianyi Zheng. *Annales de la Faculté des Sciences de Toulouse*, (2020) no. 1, pp. 97-109.
22. **Scaling limits for the critical Fortuin-Kasteleyn model on a random planar map I: cone times**, Ewain Gwynne, Cheng Mao and Xin Sun. *Ann. Inst. Henri Poincaré Probab. Stat.*, Vol. 55, No. 1, 1-60 (2019).
23. **Random planar geometry through the lens of uniform spanning tree**, Xin Sun. *Bernoulli News*, Vol. 26, No. 2, 10–13 (2019).
24. **Almost sure multifractal spectrum of SLE**, Ewain Gwynne, Jason Miller and Xin Sun. *Duke Math. J.*, Vol. 167, No. 6, 1099-1237 (2018).
25. **SLE as a mating of trees in Euclidean geometry**, Nina Holden and Xin Sun. *Commun. Math. Phys.*, 364, 171-201 (2018).
26. **Negative moments for Gaussian multiplicative chaos on fractal sets**, Christophe Garban, Nina Holden, Avelio Sepúlveda and Xin Sun. *Electronic Communications in Probability*, 23 (2018), no. 100, 1-10.
27. **Brownian motion correlation in the peanosphere for $\kappa > 8$** , Ewain Gwynne, Nina Holden, Jason Miller and Xin Sun. *Ann. Inst. Henri Poincaré Probab. Stat.*, Vol. 53, No. 4, 1866-1889 (2017).
28. **Two perspectives of the unit area quantum sphere and their equivalence**, Juhan Aru, Yichao Huang and Xin Sun. *Commun. Math. Phys.*, 356, 261-283 (2017).
29. **Deep Learning with Coherent Nanophotonic Circuits**, Yichen Shen, Nicholas C. Harris, Scott Skirlo, Mihika Prabhu, Tom Baehr-Jones, Micheal Hochberg, Xin Sun, Shijie Zhao, Hugo Larochelle, Dirk Englund and Marin Soljačić. *Nature Photonics*. Vol. 11, Issue 7, 441-446 (2017).
30. **Scaling limits for the critical Fortuin-Kasteleyn model on a random planar map II: local estimates and empty reduced word exponent**, Ewain Gwynne and Xin Sun. *Electronic Journal of Probability*, 22 (2017), no. 45, 1-56.
31. **Schnyder woods, SLE_{16} and Liouville quantum gravity**, Yiting Li, Xin Sun and Samuel Watson. *ArXiv e-prints*, May 2017.
32. **Fractional Gaussian field: a survey**, Asad Lodhia, Scott Sheffield, Xin Sun and Samuel Watson. *Probability Surveys*, Vol. 13 (2016), 1-56.

33. **Sandpiles and unicycles on random planar maps**, David Wilson and Xin Sun. *Electronic Communications in Probability*, 21 (2016), no. 57, 1-12.
34. **Joint scaling limit of a bipolar-oriented triangulation and its dual in the peanosphere sense**, Ewain Gwynne, Nina Holden and Xin Sun. *ArXiv e-prints*, Mar 2016.
35. **On fluctuations for random band Toeplitz matrices**, Yiting Li and Xin Sun. *Random Matrices: Theory and Applications*, Vol. 4, No.2 (2015).
36. **Scaling limits for the critical Fortuin-Kasteleyn model on a random planar map III: finite volume case**, Ewain Gwynne and Xin Sun. *ArXiv e-prints*, Oct 2015.
37. **Ergodicity of the Airy line ensemble**, Ivan Corwin and Xin Sun. *Electronic Communications in Probability*, 19 (2014), no. 49, 1-11.
38. **Equivalence of Liouville measure and Gaussian free field**, Nathanael Berestycki, Scott Sheffield and Xin Sun. *ArXiv e-prints*, Oct 2014.
39. **Uniform spanning forest and the bi-Laplacian Gaussian field**, Xin Sun and Wei Wu. *ArXiv e-prints*, Dec 2013.
40. **Fluctuations of eigenvalues for random Toeplitz and related matrices**, Dangzheng Liu, Xin Sun and Zhengdong Wang. *Electronic Journal of Probability*, 17 (2012), no. 95, 1-22.
41. **A note on eigenvalues of random block Toeplitz matrices with slowly growing bandwidth**, Yiting Li, Dangzheng Liu, Xin Sun and Zhengdong Wang. *Statistics and Probability Letters*, 08/2011; 81 (12).

PROFESSIONAL SERVICE

Reviewer for:

ALEA, Ann. Inst. Henri Poincaré Probab. Stat., Ann. Inst. Henri Poincaré D, Ann. of Math., Ann. Probab., Comm. Math. Phys., Duke Math. J., ESAIM: P&S, Forum Math. Sigma, Int. Math. Res. Not, Invent. Math., J. Funct. Anal., MathSciNet, Mem. Amer. Math. Soc., PMP, Probab. Theory Related Fields, Scientific Reports, Trans. Amer. Math. Soc.

Co-organizer for:

Penn/ Temple Probability Seminar (9/2020 - Present).

Random geometry and statistical physics online seminar (9/2020 - Present).

Columbia Probability Seminar (9/2017-6/2020), Columbia-Princeton Probability Day (4/2018).

Member/Panelist for:

Grant review panel for National Science Foundation (2021).

Dissertation defense committee for Mateo Wirth at University of Pennsylvania (2021).

Tutorial committee for *Seminar on Stochastic Processes* (2021).

INVITED CONFERENCE TALKS

<i>Bernoulli-IMS 10th World Congress in Probability and Statistics</i> , online	7/2021
<i>AMS Fall Eastern Sectional Meeting</i> , online	10/2020
Plenary talk at <i>Bernoulli-IMS One World Symposium</i> , online	8/2020
<i>AMS Fall Eastern Sectional Meeting</i> , Binghamton University	10/2019
<i>Stochastic process and their applications 2019</i> , Northwestern University	7/2019
Minicourse at <i>Probability and quantum field theory</i> , Porquerolle, France	6/2019
<i>Young Mathematician Forum</i> , Peking University	6/2019
<i>Applied Mathematics and Statistics Youth Forum</i> , Peking University	12/2018
<i>Amir Dembo's Birthday Conference</i> , Stanford University	12/2018
<i>Columbia-Princeton Probability Day</i> , Columbia University	4/2018

<i>SLE, GFF and LQG in NYC</i> , Columbia University	3/2017
<i>Workshop on Recent Developments in SLE</i> , Mittag-Leffler Institute	6/2016
<i>Annual Graduate Student Math Conference in Analysis</i> , Brown University	2/2016
<i>Peking University Youth Probability Forum</i> , Peking University	7/2015
<i>Seymour Sherman Lecture and Conference</i> , Indiana University	5/2015
<i>Workshop on Conformally Invariant Scaling Limits</i> , Cambridge University	1/2015

INVITED SEMINAR TALKS

School of Mathematical Science Colloquium, Peking University, online	6/2021
Duke Probability Seminar, online	4/2021
THU-PKU-BNU Joint Probability Webinar	10/2020
KU Probability and Statistics Seminar, online	4/2020
Perimeter Institute Mathematical Physics Seminar, online	2/2020
Northwestern Probability Seminar	12/2019
Penn Probability Seminar	11/2019
UCSD Math Colloquium	11/2019
Olivier Club, Cornell University	11/2019
University of Washington Rainwater Seminar	10/2019
Peking University Probability Seminar	6/2019
Chicago Probability Seminar	5/2019
Cornell Probability Seminar	4/2019
Stanford Probability Seminar	4/2019
Berkeley Probability Seminar	4/2019
UCSD Probability Seminar	2/2019
Penn/Temple Probability Seminar	2/2019
Peking University Probability Seminar	12/2018
MIT Probability Seminar	10/2018
CUNY Probability Seminar	10/2018
ETH Zurich: Seminar on Stochastic Processes	11/2017
Lyon Probability Seminar	11/2017
Indiana Probability Seminar	10/2017
Brandeis Every Topic Seminar	3/2017
Stanford Probability Seminar	1/2017
Michigan State University Probability Seminar	12/2016
ETH Zurich: ITS Talks in Theoretical Sciences	11/2016
University of British Columbia Probability Seminar	11/2016
NYU Probability and Mathematical Physics Seminar	10/2016
Brown Discrete Math Seminar	4/2016
Columbia Probability Seminar	4/2016
Northwestern Analysis Seminar	11/2015
Chicago Probability and Statistical Physics Seminar	11/2015
MIT Probability Seminar	11/2015
Harvard Random Matrix and Probability Seminar	9/2015

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