

# Joshua Pfeffer

## EMPLOYMENT

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### Columbia University

NSF Postdoctoral Fellow

Sept. 2020 - present

## EDUCATION

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### Massachusetts Institute of Technology

PhD in Mathematics

May 2020

Advisor: Scott Sheffield

### Harvard University

A.B. and A.M. in Mathematics

May 2015

*Summa Cum Laude* with Highest Honors in Mathematics

GPA: 3.99/4.00

Senior Thesis: "Dyson Brownian motion and local quantum unique ergodicity for the generalized Erdős-Renyi ensemble"

## RESEARCH INTERESTS

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### Probability theory and mathematical physics.

I study random curves and surfaces, such as Schramm-Loewner evolution and Liouville quantum gravity, that arise as scaling limits of natural discrete models and that have links to statistical mechanics and conformal field theory.

## PUBLICATIONS

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**Weak Liouville quantum gravity metrics with matter central charge  $c \in (1, 25)$ .** arxiv:2104.04020

**Geodesics and metric ball boundaries in Liouville quantum gravity.** With Ewain Gwynne and Scott Sheffield. arxiv:2010.07889

**Brownian loops and the central charge of a Liouville random surface.** With Morris Ang, Minjae Park, and Scott Sheffield. arxiv:2005.11845

**KPZ formulas for the Liouville quantum gravity metric.** *Transactions of the American Mathematical Society*, to appear. With Ewain Gwynne. arxiv:1905.11790

**Weak LQG metrics and Liouville first passage percolation.** With Julien Dubedat, Hugo Falconet, Ewain Gwynne, and Xin Sun. *Probability Theory and Related Fields*, to appear. arxiv:1905.00380

**Bounds for distances and geodesic dimension in Liouville first passage percolation.** With Ewain Gwynne. *Electronic Communications in Probability*. arxiv:1903.09561

**Liouville quantum gravity with central charge in  $(1,25)$ : a probabilistic approach.** With Ewain Gwynne, Nina Holden and Guillaume Remy. *Communications in Mathematical Physics*. arxiv:1903.09111

**External diffusion-limited aggregation on a spanning-tree-weighted random planar map.** With Ewain Gwynne. *Annals of Probability*. arxiv:1901.06860

**Connectivity properties of the adjacency graph of  $SLE_\kappa$  bubbles for  $\kappa \in (4, 8)$ .** With Ewain Gwynne. *Annals of Probability*. arxiv:1803.04923

**Anchored expansion, speed, and the hyperbolic Poisson Voronoi tessellation.** With Itai Benjamini and Elliot Paquette. *Annals of Probability*. arxiv:1409.4312

## TALKS

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University of Chicago Probability Seminar	January 2020
University of Cambridge Probability Seminar	November 2019
Columbia University Probability Seminar	October 2019
MIT Probability Seminar	September 2019
Random Geometry Follow-up Workshop, University of Cambridge	July 2018
Random Conformal Geometry and Related Fields, Korean Institute for Advanced Study	July 2018

## TEACHING

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Teaching Assistant with recitations (MIT), Fundamentals of Statistics	Spring 2018
Teaching Assistant with recitations (MIT), Topics in Math with Applications in Finance	Fall 2017
Teaching Assistant (MIT), Introduction to PDEs	Spring 2017
Teaching Assistant (MIT), Statistics for Applications	Spring 2017
Course Assistant (Harvard), Combinatorics	Spring 2014

## HONORS AND AWARDS

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National Science Foundation Graduate Research Fellowship	2015 - 2020
Phi Beta Kappa "Junior 24" (awarded to 24 students in the Harvard Class of 2015)	2014
Kupcinet-Getz Summer Research Fellow, Weizmann Institute of Science	2014
John Harvard Scholar	2012, 2014
Herchel-Smith Summer Research Fellow, Harvard University	2013
NSF REU Summer Research Fellow, University of Minnesota	2012
Seaborg SIYSS Award (US student representative to 2010 Nobel Prize ceremonies)	2010
Best in Category Award in Mathematical Sciences, Intel International Science and Engineering Fair (ISEF)	2010
National Finalist, Intel Science Talent Search (STS)	2010