Adam Quinn Jaffe

Contact Information

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Website

https://aqjaffe.github.io/

Academic Employment

Columbia University, Department of Statistics

- Postdoctoral Research Scientist — July 2024 - Present
- Mentor: Bodhisattva Sen

Education

UC Berkeley

- Ph.D. in Statistics — May 2024
- Thesis: *Geometry, Analysis, and Optimization in Probability Theory*
- Advisor: Steven Neil Evans.

Stanford University

- B.S. in Mathematics with Honors — June 2019

Research Interests

Generally: interactions between **probability, statistics, and geometry**

Specifically: clustering, dimensionality reduction, empirical Bayes, Fréchet means, optimal transport, Riemannian optimization, and stochastic processes.

Awards

UC Berkeley, Department of Statistics, Department Citation in Probability, 2024. (Given in recognition of an outstanding doctoral thesis in probability)

UC Berkeley, Outstanding Graduate Student Instructor Award, 2024
(Given in recognition of top 10% of graduate student instructors)

NSF Graduate Research Fellowship, 2019. Grant No. DGE 1752814

Papers and Preprints

Coupling theory, optimal transport, and Strassen's theorem beyond regular orders. with Daniel Raban. https://arxiv.org/abs/2509.21616 Submitted (2025+).

Consistency and inconsistency in k-means clustering with Moïse Blanchard and Nikita Zhivotovskiy. https://arxiv.org/abs/2507.06226 Submitted (2025+).

Constrained denoising, empirical Bayes, and optimal transport with Nikolaos Ignatiadis and Bodhisattva Sen. https://arxiv.org/abs/2506.09986 Submitted (2025+).

Fréchet means in infinite dimensions. https://arxiv.org/abs/2410.17214 Submitted (2025+).

Large deviations principle for Bures-Wasserstein barycenters with Leonardo Santoro. https://arxiv.org/abs/2409.11384 Submitted (2025+).

Asymptotic theory of geometric and adaptive k-means clustering. https://doi.org/10.1214/25-AOS2514 **Annals of Statistics**. 53(4): 1559-1586.

Fréchet mean set estimation in the Hausdorff metric, via relaxation with Moïse Blanchard. https://doi.org/10.3150/24-BEJ1734 **Bernoulli**. 31(1), 432-456.

Constructing maximal germ couplings of Brownian motions with drift with Sebastian Hummel. https://doi.org/10.1214/24-ECP592 **Electronic Communications in Probability**. 29, 1-11.

Limit theorems for Fréchet mean sets with Steven N. Evans. https://doi.org/10.3150/23-BEJ1603 **Bernoulli**. 30(1), 419-447.

A strong duality principle for equivalence couplings and total variation. https://doi.org/10.1214/23-EJP1016 **Electronic Journal of Probability**. 28, 1-33.

Virtual Markov chains with Steven N. Evans. https://doi.org/10.53733/147. **New Zealand Journal of Mathematics (Vaughan Jones Memorial Special Issue)**. 52, 511–559.

Teaching

Instructor, Columbia University, Department of Statistics
- Elementary stochastic processes (STAT GU4207 / STAT GR5207), Spring 2025.

Teaching Assistant, UC Berkeley, Department of Statistics
- Machine learning (STAT 154 / STAT 254), Spring 2024.
- Probability theory (MATH 218B / STAT 205B), Spring 2023.
- Stochastic processes (STAT 150), Fall 2022 and Fall 2023
- Game theory (STAT 155), Spring 2021.

Other Work

New York Mets, Baseball Data Science Intern (Summer 2023)
- Created strategic methodology for the MLB Rule 4 Draft
- Developed statistical model to predict future player availability and stochastic optimal control framework to predict optimal budget allocation
- Implenented codebase in `R` and `Python` to make real-time predictions

Selected Invited Talks

65th ISI World Statistics Congress, Invited Paper Session on Recent Advances in Geometric and Object Data Analysis. *Fréchet Means in Infinite Dimensions.* (The Hague, Netherlands; October 2025)

Columbia Applied Probability Seminar. *Large Deviations Principle for Bures-Wasserstein Barycenters.* (New York, NY, USA; October 2025)

CUNY Probability Seminar. *Local Limit Principles via Coupling.* (New York, NY, USA; September 2025)

JSM Invited Paper Session on Optimal Transport in Statistics and Machine Learning. *Constrained Denoising, Empirical Bayes, and Optimal Transport.* (Nashville, TN, USA; August 2025)

4th Italian Meeting on Probability and Mathematical Statistics, Session on Statistical Inference in Infinite-Dimensional Spaces. *Fréchet Means in Infinite Dimensions* (Rome, Italy; June 2024)

EPFL Statistics Seminar. *Large Deviations Principle for Bures-Wasserstein Barycenters.* (Lausanne, Switzerland; May 2024)

UC Berkeley Probability Seminar. *Large Deviations Principle for Bures-Wasserstein Barycenters.* (Berkeley, CA, USA; May 2024)

International Shape Statistics Seminar. *Fréchet Mean Set Estimation in the Hausdorff Metric, via Relaxation* (online; December 2023)

UC Berkeley Probability Seminar. *A Strong Duality Principle for Equivalence Couplings and Total Variation.* (Berkeley, CA, USA; April 2023)

Colorado State University Topology Seminar. *Limit Theorems for Fréchet Mean Sets.* (Fort Collins, CO, USA; February 2023)

Reviewing Service

- Annals of Applied Probability
- Annals of Statistics
- Bernoulli
- Biometrika
- Electronic Communications in Probability
- Electronic Journal of Probability
- Journal of the American Statistical Association
- Journal of Theoretical Probability
- Sankhyā A
- Stochastic Process and their Applications

Organizational Activities

UC Berkeley Student Probability Seminar, leading reading groups in:

- Stein's method (Spring 2023)
- Large deviations for random graphs (Fall 2022)
- Gaussian free field (Spring 2022)
- Markov chain mixing times (Fall 2021)
- Random matrix theory (Spring 2021)

REUs, Workshops, and Short Courses

Geometric Sciences in Action: from Geometric Statistics to Shape Analysis at CIRM (Marseille, France; May 2024)

Online Open Probabiltity School (OOPS) at PIMS-CRM (online; Summer 2020, Summer 2021)

RIPS at IPAM, advised by The Aerospace Corporation (Los Angeles, CA, USA; Summer 2018)

REU at ICERM, advised by Henry Adams (Providence, RI, USA; Summer 2017)

Ross Mathematics Program (Columbus, OH, USA; Summer 2014)

Other Information

Natural Languages: English (native), Spanish (advanced)

Computer Languages: Python, R, LaTeX