Anya Katsevich

Postdoctoral Fellow

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Education

Courant Institute, New York University, Ph.D. in Mathematics, May 2022.
Advisors: Afonso Bandeira and Jonathan Weare

University of North Carolina at Chapel Hill, B.S. in Mathematics with Highest Honors, May 2017.
Thesis Advisor: Jeremy Marzuola.

Awards

- NSF Postdoctoral Research Fellowship, 2022-2025
- Paul Garabedian Fellowship, "awarded each year to an outstanding PhD student", 2021
- Department of Energy Computational Sciences Graduate Fellowship (DOE CSGF), 2017-2021
- NSF Graduate Research Fellowship (declined for DOE CSGF)
- Barry Goldwater Scholarship, 2015-2017
- Archibald Henderson Medal, awarded by UNC math dept. for "high degree of mathematical ability and the greatest promise of originality in the field", 2015

Research Interests

High-dimensional Bayesian inference, applied probability, math of data science.

Preprints

[1] **A. Katsevich**. Tight skew adjustment to the Laplace approximation in high dimensions. Available on arXiv.

[2] **A. Katsevich**. Improved Scaling with Dimension in the Bernstein-von Mises Theorem for Two Statistical Models. Available on arXiv.

[3] **A. Katsevich**. Tight bounds on the Laplace approximation accuracy in high dimensions. Available on arXiv.

[4] **A. Katsevich**, P. Rigollet. On the Approximation Accuracy of Gaussian Variational Inference. Available on arXiv.

Publications

[1] **A. Katsevich.** From local equilibrium to numerical PDE: Metropolis crystal surface dynamics in the rough scaling limit. Accepted, *SIAM Multiscale Modeling and Simulation.* Available on arXiv.

[2] **A. Katsevich.** The Local Equilibrium State of a Crystal Surface Jump Process in the Rough Scaling Regime. *SIAM Multiscale Modeling and Simulation* 20 (4): pp. 1315-1360 (2022). Available on arXiv.

[3] **A. Katsevich**, A. Bandeira. Likelihood Maximization and Moment Matching in Low SNR Gaussian Mixture Models. *Communications on Pure and Applied Mathematics*, 2022. Available on arXiv.

[4] Y. Gao, **A. Katsevich**, J. Liu, J. Lu, J. Marzuola Analysis of a fourth order exponential PDE arising from a crystal surface jump process with Metropolis-type transition rates. *Pure and Applied Analysis*, 2020 (to appear) Available on arXiv.

[5] **A. Katsevich**, P. Mikusiński. On De Graaf spaces of pseudoquotients. *Rocky Mountain J. Math* 45 (5): pp. 1445-1455 (2015). Available on Project Euclid.

[6] **A. Katsevich**, P. Mikusiński. Order in Spaces of Pseudoquotients. *Topology Proceedings* 44: pp. 21-31 (2014). Available from journal.

Presentations

Invited talks

- *The connection between EM and the method of moments in low SNR Gaussian mixtures.*
  National Meeting of the Sociedade Portuguesa de Matemática (ENSPM), July 2021, held virtually.
- *Hydrodynamic limits under rough local equilibrium.*
  Southeastern Probability Conference at UNC Chapel Hill. August 2022.
- *The approximation accuracy of Gaussian variational inference.*
  "Optimization and Statistical Learning" workshop, Les Houches Physics School. January 2023
- *The Laplace approximation and Bernstein von Mises theorem for high-dimensional Bayesian inference.*
  Harvard University, Probabilitas Seminar. April 2023
  Georgia Institute of Technology, Stochastics Seminar. August 2023
  The Mathematics of Data workshop, Institute for Mathematical Sciences, National University of Singapore. January 2024

Contributed talks

- *Statistical Inference for High Variance Gaussian Mixture Models.*
  DOE Computational Sciences Graduate Fellowship (CSGF) Program Review, July 2021, held virtually.

Poster Presentations

- *Microgrid Reliability under Uncertainty: Static and Dynamic Analysis*
  DOE CSGF Annual Program Review, July 2019, in Arlington, VA