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.

- *Gaussian approximations to posterior distributions in high dimensions.*
  "Optimization and Statistical Learning" workshop, Les Houches Physics School. January 2023
  Harvard University, Probabilitas Seminar. April 2023
  Georgia Institute of Technology, Stochastics Seminar. August 2023

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