

# Ruiyi Yang

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CONTACT INFORMATION	Fine Hall 209, Washington Road Princeton University, Princeton, NJ 08544.	E-mail: ry8311@princeton.edu Website: <a href="https://ruiyiyang.github.io">https://ruiyiyang.github.io</a>
POSITION	<b>Princeton University</b> , Princeton, NJ. <ul style="list-style-type: none"><li>• Postdoctoral Research Associate, Program in Applied and Computational Mathematics. Supervisor: Amit Singer.</li></ul>	Aug 2022–Aug 2025
EDUCATION	<b>University of Chicago</b> , Chicago, IL. <ul style="list-style-type: none"><li>• Ph.D. in Computational and Applied Mathematics. Advisor: Daniel Sanz-Alonso.</li></ul> <b>University of California, Los Angeles</b> , Los Angeles, CA. <ul style="list-style-type: none"><li>• B.S. in Mathematics. College Honors Program.</li></ul>	Sep 2017–Jun 2022  Sep 2013–Jun 2017
PUBLICATIONS AND PREPRINTS	(Authors are ordered alphabetically in all papers.) <ol style="list-style-type: none"><li>1. Bryon Aragam and Ruiyi Yang. Model-free Estimation of Latent Structure via Multiscale Non-parametric Maximum Likelihood. <i>arXiv preprint</i>, 2024. Preprint available at <a href="https://arxiv.org/abs/2410.22248">https://arxiv.org/abs/2410.22248</a>.</li><li>2. Daniel Sanz-Alonso and Ruiyi Yang. Gaussian process regression under computational and epistemic misspecification. <i>SIAM Journal on Numerical Analysis</i>, 63(2):495-519, 2025.</li><li>3. Amit Singer and Ruiyi Yang. Alignment of density maps in Wasserstein distance. <i>Biological Imaging</i>, 4:e5, 2024</li><li>4. Hwanwoo Kim, Daniel Sanz-Alonso, and Ruiyi Yang. Optimization on manifolds via graph Gaussian processes. <i>SIAM Journal on Mathematics of Data Science</i>, 6(1):1-25, 2024</li><li>5. Bryon Aragam and Ruiyi Yang. Uniform consistency in nonparametric mixture models. <i>The Annals of Statistics</i>, 51(1):362-390, 2023</li><li>6. Nicolás García Trillos, Daniel Sanz-Alonso, and Ruiyi Yang. Mathematical foundations of graph-based Bayesian semi-supervised learning. <i>Notices of the American Mathematical Society</i>, 69(10), 2022</li><li>7. Daniel Sanz-Alonso and Ruiyi Yang. Finite element representations of Gaussian processes: Balancing numerical and statistical accuracy. <i>SIAM/ASA Journal on Uncertainty Quantification</i>, 10(4):1323-1349, 2022</li><li>8. Daniel Sanz-Alonso and Ruiyi Yang. Unlabeled data help in graph-based semi-supervised learning: a Bayesian nonparametrics perspective. <i>Journal of Machine Learning Research</i>, 23(97):1-28, 2022</li><li>9. Daniel Sanz-Alonso and Ruiyi Yang. The SPDE approach to Matérn fields: Graph representations. <i>Statistical Science</i>, 37(4):519-540, 2022</li><li>10. John Harlim, Daniel Sanz-Alonso, and Ruiyi Yang. Kernel methods for Bayesian elliptic inverse problems on manifolds. <i>SIAM/ASA Journal on Uncertainty Quantification</i>, 8(4):1414-1445, 2020</li><li>11. Nicolás García Trillos, Daniel Sanz-Alonso, and Ruiyi Yang. Local regularization of noisy point clouds: Improved global geometric estimates and data analysis. <i>Journal of Machine Learning Research</i>, 20(136):1-37, 2019</li></ol>	
AWARDS	<ul style="list-style-type: none"><li>• Travel Award, SIAM Conference on Uncertainty Quantification.</li><li>• Harper Dissertation Fellowship, University of Chicago. <i>In recognition of record or achievement and professional promise, one of University of Chicago's highest honors.</i></li><li>• Travel Award, SIAM Conference on Computational Science and Engineering.</li><li>• Travel Award, SIAM Conference on Mathematics of Data Science.</li><li>• Travel Award, GTDAML Graduate Student Conference.</li></ul>	2022 2021 2021 2020 2019

## TALKS

- Alignment of Density Maps in Wasserstein Distance. Oct 2024  
SIAM Conference on Mathematics of Data Science, Atlanta GA.  
Minisymposium: “Processing data with geometric structure: optimal transport and manifold learning”.
- Optimization on Manifolds via Graph Gaussian Processes. Feb 2024  
University of California Davis MADDD Seminar.
- Optimization on Manifolds via Graph Gaussian Processes. Jan 2024  
IMS Young Mathematical Scientists Forum—Applied Mathematics, Singapore.
- Optimization on Manifolds via Graph Gaussian Processes. Mar 2023  
New Jersey Institute of Technology Statistics Seminar.
- Unlabeled Data Help in Graph-Based Bayesian Semi-Supervised Learning. Sep 2022  
SIAM Conference on Mathematics of Data Science, San Diego CA.  
Minisymposium: “Graph-Based Methods in Low-Label Rate Machine Learning”.
- Graph-Based Approximation of Matérn Gaussian Fields. Aug 2022  
IMSI Workshop on Expressing and Exploiting Structure in Modeling, Theory, and Computation with Gaussian Processes, Chicago IL.
- Balancing Numerical and Statistical Accuracy in the SPDE Approach to Gaussian Processes. Apr 2022  
SIAM Conference on Uncertainty Quantification, Atlanta GA.  
Minisymposium: “New Developments in Gaussian Processes”.
- Matérn Gaussian Fields on Graphs: Theory and Applications. Aug 2021  
Joint Statistical Meetings (Virtual).  
Topic-contributed Session: “Algorithms for Threat Detection”.
- Graph-Based Methods for Bayesian Elliptic Inverse Problems on Manifold. Mar 2021  
SIAM Conference on Computational Science and Engineering (Virtual).  
Minisymposium: “Data-Driven Scientific Computing”.
- Graph-Based Approximation of Matérn Gaussian Fields. Feb 2021  
University of Wisconsin-Madison Statistics Seminar (Virtual).
- Graph-Based Methods for Inverse Problems on Manifolds and Point Clouds. Jun 2020  
SIAM Conference on Mathematics of Data Science (Virtual).  
Minisymposium: “Bridging Data Assimilation with Data-driven analysis”.
- Local Regularization of Noisy Point Clouds. Jun 2019  
GTDAML Graduate Student Conference, The Ohio State University.

TEACHING  
EXPERIENCE

- Princeton University Course Instructor
  - MAT321/APC321 Numerical Analysis and Scientific Computing Fall 2023
- University of Chicago Guest Lecturer
  - CAAM 31440: Applied Analysis. Fall 2021
- University of Chicago Teaching Assistant
  - CAAM 31440: Applied Analysis. Fall 2021
  - CAAM 31210: Applied Functional Analysis. Fall 2018, 2019, Winter 2021, 2022
  - STAT 24300: Numerical Linear Algebra. Fall 2020
  - CAAM 31511: Monte Carlo Simulation. Spring 2020, 2022
  - STAT 31700: Introduction to Probability Models. Winter 2020
  - CAAM 31450: Applied Partial Differential Equations. Spring 2019
  - CAAM 31220: Partial Differential Equations. Winter 2019

PROFESSIONAL SERVICES	<ul style="list-style-type: none"> <li>• Conference Session Organizer SIAM Conference on Mathematics of Data Science, Atlanta GA. Oct 2024 Minisymposium: “Recent Advances in Gaussian Process and Kernel Methods” (with Daniel Sanz-Alonso).</li> <li>• Journal Referee Journal of the Royal Statistical Society Series B; Journal of the American Statistical Association; Journal of Machine Learning Research; Statistics and Computing; IJSE Transactions; Signal Processing</li> <li>• Conference Reviewer NeurIPS (2023,2024); ICML (2024); ICLR (2024,2025); AAAI (2025); AISTATS (2025)</li> </ul>
SKILLS	Matlab, Python, R.