

BORONG ZHANG

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EDUCATION

University of Wisconsin–Madison

Ph.D. Candidate in Mathematics, Advisors: Prof. Qin Li & Leonardo Andrés Zepeda Núñez

• **Honors:** Mathematics Department Ascending Scholar Fellowship

Madison, WI

09/2020 – Present

University of California, Berkeley

Bachelor of Arts in Applied Mathematics & Computer Science

• **Honors:** High Honors in Applied Mathematics; Distinction in General Scholarship; Dean's Honors Lists

Berkeley, CA

08/2016 – 06/2020

PUBLICATIONS

Zhang, B., Li, Q., & Di, Z. W. (2025). Stochastic multigrid minimization for ptychographic phase retrieval [Preprint]. ArXiv.org. <https://arxiv.org/abs/2504.10118>

Zhang, B., Guerra, M., Li, Q., & Zepeda-Núñez, L. (2025). Back-Projection Diffusion: Solving the wideband inverse scattering problem with diffusion models. *Computer Methods in Applied Mechanics and Engineering*, 443, 118036. <https://doi.org/10.1016/j.cma.2025.118036>

Zhang, B., Zepeda-Nunez, L., & Li, Q. (2024). Solving the wide-band inverse scattering problem via equivariant neural networks. *Journal of Computational and Applied Mathematics*, 451, 116050–116050. <https://doi.org/10.1016/j.cam.2024.116050>

Huang, E. G., Wang, R.-Y., Xie, L., Chang, P., Yao, G., **Zhang, B.**, Ham, D. W., Lin, Y., Blakely, E. A., & Sachs, R. K. (2020). Simulating galactic cosmic ray effects: Synergy modeling of murine tumor prevalence after exposure to two one-ion beams in rapid sequence. *Life Sciences in Space Research*, 25, 107–118. <https://doi.org/10.1016/j.lssr.2020.01.001>

TALKS

Efficient Symmetry-Driven Diffusion Models for Wideband Inverse Scattering

• SIAM Conference on Applications of Dynamical Systems

05/2025

Denver, CO

Multigrid-based Stochastic Minimization for Ptychographic Phase Retrieval

• Copper Mountain Conference On Iterative and Multigrid Methods

04/2025

Denver, CO

Multigrid-based Stochastic Minimization for Ptychographic Phase Retrieval

• Graduate Applied Math Seminar, University of Wisconsin-Madison

03/2025

Madison, WI

Solving the Inverse Scattering Problem: Leveraging Symmetries for Machine Learning

• SIAM Student Chapter Seminar, University of Wisconsin-Madison

11/2024

Madison, WI

Solving the Inverse Scattering Problem: Leveraging Symmetries for Diffusion Models

• Graduate Applied Math Seminar, University of Wisconsin-Madison

09/2024

Madison, WI

CONFERENCES, WORKSHOPS & SUMMER SCHOOLS

Statistical and Computational Challenges in SciML

• The Institute for Mathematical and Statistical Innovation

06/2025

Chicago, IL

SIAM Conferences SIAM Conference on Applications of Dynamical Systems

• Sheraton Denver Downtown Hotel

05/2025

Denver, CO

Copper Mountain Conference On Iterative and Multigrid Methods

• Copper Mountain

04/2025

Frisco, CO

Atlanta SIAM Student Conference • Georgia Institute of Technology	03/2025 Atlanta, GA
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Data-driven PDE-based Inverse Problem, in Theory and Practice • University of Wisconsin-Madison	08/2024 Madison, WI
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Junior Researcher Meeting, on Forward and Inverse Kinetic theory • University of Wisconsin-Madison	09/2022 Madison, WI
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RESEARCH EXPERIENCE & INTERNSHIPS

Givens Associate, MCS Division, Argonne National Laboratory Supervisor: Dr. Zichao (Wendy) Di • Upcoming	05/2025 - 08/2025 Lemont, IL
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Research Aide, MCS Division, Argonne National Laboratory Supervisor: Dr. Zichao (Wendy) Di • Proposed stochastic multigrid methods for solving ptychographic phase retrieval. • Designed, implemented and tested the model in Python.	06/2024 - 09/2024 Lemont, IL
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Solving the Wideband Inverse Scattering Problem with Diffusion Models University of Wisconsin-Madison • Proposed an end-to-end probabilistic framework for approximating the posterior distribution induced by the inverse scattering map from wideband scattering data. • Designed, implemented and tested the model in JAX/Flax.	01/2024 - 08/2024 Madison, WI
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Solving the Wide-band Inverse Scattering Problem via Equivariant Neural Networks University of Wisconsin-Madison • Proposed novel deep neural network architecture for solving the inverse scattering problem with wide-band datasets • Designed, implemented and tested the network in TensorFlow.	10/2023 Madison, WI
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TEACHING EXPERIENCE

Math 211: Calculus, Head TA	Spring 2025
Math 112: College Algebra, Instructor	Fall 2023-Fall 2024
Math 234: Calculus - Functions of Several Variables, TA	Spring 2023
Math 211: Calculus, TA	Fall 2022
Math 521: Analysis I, TA	Summer 2022
Math 222: Calculus and Analytic Geometry II, TA	Spring 2021
Math 221: Calculus and Analytic Geometry I, TA	Fall 2020

ORGANIZATIONS & OUTREACH

Directed Reading Program, Mentor • Topic: Stochastic Differential Equations: Score-Based Diffusion Models	Spring 2025
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Directed Reading Program, Mentor • Topic: Solving the Inverse Scattering Problem: Classical Methods and Machine Learning	Fall 2024
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SKILLS & INTERESTS

Programming Languages: Python, Java, MatLAB, Julia, R, C Libraries, APIs, and Technologies: Git, Jupyter, SciPy, NumPy, JAX, Flax, Tensorflow, PyTorch
