

Hanwen Zhang

CONTACT INFORMATION	Department of Applied and Computational Mathematics Yale University 12 Hillhouse Avenue, New Haven CT 06511, USA	
RESEARCH INTERESTS	Numerical analysis, fast algorithms, computational physics, PDE-constrained optimization	
EMPLOYMENT	Gibbs Assistant Professor, Yale University Graduate Research Assistant, Yale University Optical Scientist, Facebook Reality Lab	07/2022– 09/2017–05/2022 06/2021–08/2021
EDUCATION	Ph.D., Applied Physics, Yale University B.Sc., Physics, National University of Singapore B.Eng., Material Science, National University of Singapore	09/2017–05/2022 08/2012–05/2017 08/2012–05/2017
PUBLICATIONS	<ol style="list-style-type: none">1. H Zhang. “Constructing optimal Wannier functions via potential theory, Part II: isolated multiband for matrix models.” (To be submitted.)2. H Zhang. “A highly accurate procedure for computing globally optimal Wannier functions in one-dimensional crystalline insulators, Part II.” <i>Yale CS Technical Report</i> (2025)3. H Zhang. “Constructing optimal Wannier functions via potential theory: isolated single band for matrix models.” <i>Preprint</i> (2025).4. A. Gopal, H Zhang. “A highly accurate procedure for computing globally optimal Wannier functions in one-dimensional crystalline insulators.” <i>Advances in Computational Mathematics</i> (2025).5. H. Zhang, V. Rokhlin. “Finding roots of complex analytic functions via generalized colleague matrices.” <i>Advances in Computational Mathematics</i> (2024).6. W. Xue, H. Zhang, A. Gopal, V. Rokhlin, O. Miller. “Fullwave design of cm-scale cylindrical metasurfaces via fast direct solvers.” <i>Preprint</i> (2023).7. H. Zhang, Z. Kuang, S. Puri and O. Miller. “Conservation-law-based global bounds to quantum optimal control.” <i>Physical Review Letters</i> (2021).8. H. Zhang, O. Miller. “Quasinormal coupled mode theory.” <i>Preprint</i> (2020).9. H. Zhang, C.-W. Hsu, and O. Miller. “Scattering concentration bounds: brightness theorems for waves.” <i>Optica</i> (2019).10. Solutions manual to Quantum Mechanics by Julian Schwinger with Berthold-Georg Englert. (To appear.)	
TALKS	<ul style="list-style-type: none">• <i>Constructing optimal Wannier functions via potential theory</i>, NYU Courant Institute of Mathematical Sciences (2025)• <i>Constructing optimal Wannier functions via potential theory</i>, Flatiron Institute Center for Computational Mathematics (2025)• <i>Finding scattering resonances via generalized colleague matrices</i>, SIAM Conference on Computational Science and Engineering (2025)• <i>Finding scattering resonances via generalized colleague matrices</i>, UMass Lowell Mathematics & Statistics Colloquium (2024)	

- *An efficient scheme for fullwave inverse design of large-scale metasurfaces*, SPIE (2022)
- *Conservation-law-based global bounds to quantum optimal control*, SUTD Mathematics and Technology Seminar (2021)
- *Brightness theorems for nanophotonics*, CLEO (2019)

SERVICE AND
OUTREACH

- Organizer – Applied Mathematics Seminar, Yale University, 2023–2024
- Reviewer – Applied and Computational Harmonic Analysis; Journal of Scientific Computing.

TEACHING

Yale University, Department of Mathematics

- Instructor – MATH 325 Introduction to Functional Analysis, Spring 2026
- Instructor – MATH 325 Introduction to Functional Analysis, Spring 2025
- Instructor – MATH 246 Ordinary Differential Equations, Fall 2024
- Instructor – MATH 222 Linear Algebra with Applications, Spring 2024
- Instructor – MATH 246 Ordinary Differential Equations, Fall 2023
- Instructor – MATH 222 Linear Algebra with Applications, Spring 2023
- Instructor – MATH 222 Linear Algebra with Applications, Fall 2022

Yale University, Department of Physics

- Teaching assistant – PHYS 502 Electromagnetic Theory I, Spring 2019