

Hanwen Zhang

Contact Information

Department of Applied and
Computational Mathematics

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Yale University

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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

Education Ph.D. , Applied Physics, Yale University
B.Sc. , Physics, National University of Singapore
B.Eng. , Material Science, National University of Singapore

Publications

H Zhang. “Constructing optimal Wannier functions via potential theory,
Part II: isolated multiband for matrix models.” (To be submitted.)

H Zhang. “A highly accurate procedure for computing globally optimal Wannier functions in one-dimensional crystalline i

H Zhang. “Constructing optimal Wannier functions via potential theory: isolated single band for matrix models.” *Preprint*

A. Gopal, **H Zhang**. “A highly accurate procedure for computing globally optimal Wannier functions in one-dimensional c

H. Zhang, V. Rokhlin. “Finding roots of complex analytic functions via generalized colleague matrices.” *Advances in Com*

W. Xue, **H. Zhang**, A. Gopal, V. Rokhlin, O. Miller. “Fullwave design of cm-scale cylindrical metasurfaces via fast direct s

H. Zhang, Z. Kuang, S. Puri and O. Miller. “Conservation-law-based global bounds to quantum optimal control.” *Physica*

H. Zhang, O. Miller. “Quasinormal coupled mode theory.” *Preprint* (2020).

H. Zhang, C.-W. Hsu, and O. Miller. “Scattering concentration bounds: brightness theorems for waves.” *Optica* (2019).

Solutions manual to Quantum Mechanics by Julian Schwinger with Berthold-Georg Englert. (To appear.)

Talks

Constructing optimal Wannier functions via potential theory, NYU Courant Institute of Mathematical Sciences (2025)

Constructing optimal Wannier functions via potential theory, Flatiron Institute Center for Computational Mathematics (202

Finding scattering resonances via generalized colleague matrices, SIAM Conference on Computational Science and Engineeri

Finding scattering resonances via generalized colleague matrices, 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