Zhenhao Li

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Research interests

Mathematical physics, microlocal analysis, PDEs, spectral theory, dynamical systems

Education

Massachusetts Institute of Technology, Ph.D. student 2021-present
Advisor: Semyon Dyatlov

Yale University, dual B.S./M.S. in Mathematics 2017-2021

Research

12. *Evolution of internal waves in a 2D subcritical channel*
with Jian Wang and Jared Wunsch, preprint (2025); arXiv:2509.20327

11. *Internal waves in a 2D subcritical channel*
with Jian Wang and Jared Wunsch, preprint (2025); arXiv:2408.16953

10. *Long time quantum–classical correspondence for open systems in trace norm*,
Annales Henri Poincaré (2025); arXiv:2408.16953

9. *Internal waves in aquariums with characteristic corners*,
Pure and Applied Analysis **7** (2025), 445-534; arXiv:2402.01896

8. *Internal waves in 2D domains with ergodic classical dynamics*,
with Yves Colin de Verdière, Probability and Mathematical Physics, **5** (2024), 735-751; arXiv:2306.13834

7. *2D internal waves in an ergodic setting*,
preprint (2023); arXiv:2301.12365

6. *Weyl laws for open quantum maps*,
Journal of Spectral Theory **12** (2023), 1541–1566; arXiv:2202.10591

5. *Uniqueness of excited states to* $-\Delta u + u - u^3 = 0$ *in three dimensions*,
with Alex Cohen and Wilhelm Schlag, Analysis & PDEs, **17** (2024), 1887-1906; arXiv:2101.08356

4. *Dynamic transitions of the Swift-Hohenberg equation with third-order dispersion*,
Discrete and Continuous Dynamical Systems-B, **26** (2021), 6069-6090; arXiv:2007.15722

3. *Certain hyperbolic regular polygonal tiles are isoperimetric*,
with Jack Hirsch, Jackson Petty, and Christopher Xue, Geometriae Dedicata, **214** (2021), 65–77; arXiv:1910.12966

2. *The Optimal Double Bubble for Density* r^p,
with Jack Hirsch, Jackson Petty, and Christopher Xue, Rose-Hulman Undergraduate Mathematics Journal, **22** (2021); arXiv:1908.10766

1. *Optimal monohedral tilings of hyperbolic surfaces*,
with Leonardo Di Giosia, Jahangir Habib, Jack Hirsch, Lea Kenigsberg, Dylanger Pittman, Jackson Petty, Christopher Xue, Weitao Zhu, Rose-Hulman Undergraduate Mathematics Journal, **24** (2023); arXiv:1911.04476

Talks

The Austral Winter Workshop on Microlocal Analysis and Non-elliptic Fredholm Theory, *Quantum-classical correspondence past Ehrenfest time* (poster)	2025
Simons Foundation Moire Materials Magic, *Quantum-classical correspondence past Ehrenfest time* (poster)	2025
Spring Eastern Sectional Meeting, Special Session on Spectral Theory and Quantum Systems, *Quantum-classical correspondence past Ehrenfest time*	2025
Spring Central Sectional Meeting, Special Session on Recent Trends in Harmonic Analysis and PDE I, *Internal waves in a 2D aquarium*	2025
Joint Math Meetings, AMS Special Session on Mathematical Quantum Chaos, *Quantum–classical correspondence past Ehrenfest time*	2025
Berkeley APDE Seminar, *Quantum–classical correspondence past Ehrenfest time*	2024
SLMath: Special Geometric Structures and Analysis, *A basic introduction to b-calculus*	2024
Berkeley HADES Seminar, *Internal waves in a 2D aquarium*	2024
Purdue Spectral and Scattering Theory Seminar, *Internal waves in a 2D aquarium*	2024
Yale Analysis Seminar, *Internal waves in a 2D aquarium*	2024
Séminaire de Mathématiques Supérieures 2023: Periodic and Ergodic Spectral Problems, *Internal waves in 2D domains*	2023
QMATH 15, *Weyl laws for open quantum maps*	2022
Tsinghua Microlocal Analysis Seminar, *Weyl laws for open quantum maps*	2022
Indiana REU conference, *Dynamic transitions of the Swift-Hohenberg equation with third-order dispersion*	2021
Joint Math Meetings, *Certain hyperbolic regular polygonal tiles are isoperimetric*	2019
Young Mathematicians Conference, *The Optimal Double Bubble for Density r^p*	2019

Teaching

18.032 (Differential Equations, MIT), teaching assistant	Spring 2025
MIT directed reading program on classical mechanics	Winter 2024
18.155 (Differential Analysis I, MIT), teaching assistant	Fall 2022
18.100A (Real Analysis, MIT), teaching assistant	Fall 2022
RSI mentor for two projects, see abstracts	Summer 2022
MIT directed reading program on dynamical systems	Winter 2022
MATH305 (Real Analysis, Yale), grader	Spring 2021
MATH310 (Complex Analysis, Yale), grader	Fall 2020
MATH270 (Set Theory, Yale), grader	Spring 2020
MATH300 (Topics in Analysis, Yale), grader	Fall 2019

Awards/Fellowships

MathWorks Fellowship	2023
NSF GRFP Honorable Mention	2021
George Beckwith prize in astronomy or mathematics (Yale)	2021