
EDUCATION

Stanford University
PhD, Mathematics, advised by Professor Rafe Mazzeo

September 2021 – June 2027
Stanford, CA

University of Toronto, Trinity College
Honors Bachelor of Science, Mathematics Specialist

September 2018 – August 2021
Toronto, ON

RESEARCH

My interests lie at the intersection of spectral geometry, microlocal analysis, and inverse problems. I seek to understand how the algebraic structure of spectral data reflects geometric rigidity.

COMPLETED WORKS

- R. Speciel, *Steklov rigidity of Euclidean balls* (arXiv:2608.05577), preprint, 2026.
- R. Speciel, *Stability for commutativity properties of the Dirichlet-to-Neumann map* (arXiv:2510.08822), International Mathematics Research Notices, 2026.
- R. Speciel, *Surfaces with commuting boundary Laplacian and Dirichlet-to-Neumann map* (arXiv:2503.00270), Journal of Spectral Theory, 2026.
- R. Speciel, *A deformation approach to the BFK formula* (arXiv:2504.12509), Canadian Mathematical Bulletin, 2025.
- D. Nackan and R. Speciel, *Continuous limits of generalized pentagram maps* (arXiv:2010.00723), Journal of Geometry and Physics, 2021.
- G. Adam and R. Speciel, *Evaluating ensemble robustness against adversarial attacks* (arXiv:2005.05750), 2020.

TALKS

- Joint Mathematics Meetings (2027)
- Programme in Geometric Spectral Theory and Applications at the Isaac Newton Institute (2026)
- Boundary Inverse Problems Seminar (2026)
- Spectral Geometry in the Clouds (2025)
- UC Santa Cruz Geometry and Analysis Seminar (2025)
- Stanford Student Analysis Seminar (2021, 2022, 2023, 2024 as organizer, 2025)
- Stanford Graduate Students Colloquium (2021, 2022, 2023, 2024, 2025)
- Stanford Undergraduate Mathematical Organization (2021, 2022, 2023, 2024, 2025)
- Seminar on Boundary Value Problems for Dirac-Type Operators (2022 as organizer)
- Index Theorem Lecture Series (2022, 10 talks)

CONFERENCES AND WORKSHOPS

- Random and Arithmetic Models in Spectral Theory, Isaac Newton Institute, Cambridge (2026)
- The Future of Mathematics Symposium, Stanford University (2026)
- Geometry of Eigenvalues, Isaac Newton Institute, Cambridge (2026)
- 12th Applied Inverse Problems Conference, FGV EMAp (2025)
- Geometric Inverse Problems and Inverse Problems for Elliptic Equations Summer School, UC Santa Cruz (2024)
- Paris-Saclay Conference in Analysis and PDE, Laboratoire de Mathématiques d'Orsay (2024)
- From Microlocal to Global Analysis, MIT (2024)
- Microlocal and Probabilistic Methods in Geometry and Dynamics, Sorbonne-Université – Jussieu (2023)
- International Doctoral Summer School in Conformal Geometry and Non-local Operators, University of Granada (2023)
- Joint Japan/US Collaborative Workshop on Geometric Analysis, Stanford University (2023)
- Northeast Workshop in Geometric Analysis, University of Connecticut (2022)
- Geometric Applications of Microlocal Analysis, Stanford University (2022)

TEACHING

- Lecturer for MATH 190 – Communicating Mathematics, Stanford University (2026, 2027)

- Teaching Assistant for MATH 51 – Linear Algebra and Differential Calculus of Several Variables, Stanford University (2025, 2026)
- Teaching Assistant for MATH 62CM – Modern Mathematics: Continuous Methods, Stanford University (2023, 2024, 2026)
- Course Assistant for MATH 116 – Complex Analysis, Stanford University (2021, 2025)
- Teaching Assistant for Microlocal Analysis and the b -Calculus – Special Geometric Structures and Analysis Summer School, Simons Laufer Mathematical Sciences Institute (2024)
- Course Assistant for MATH 115 – Functions of a Real Variable, Stanford University (2022)
- Teaching Assistant for MAT 187 – Calculus II, University of Toronto (2021)
- Teaching Assistant for MAT 188 – Linear Algebra, University of Toronto (2020)

AWARDS AND FELLOWSHIPS

- Seed grant for AI in teaching and learning – US\$5,500 awarded by Stanford University (2026)
- Thought leadership award – US\$3,540 awarded by Stanford University (2026)
- Open Problems Benchmark selection – US\$1,000 awarded by EpochAI (2026)
- Centennial Teaching Assistant Award – US\$1,000 awarded by Stanford University (2025)
- NSERC Doctoral Postgraduate Scholarship – CA\$78,500 awarded by the Government of Canada (2022 – 2025)
- George Gray Falle Scholarship – CA\$2,000 awarded by the University of Toronto (2022)
- Margaret Ronald Taylor and Thomas Paxton Taylor Scholarship – CA\$3,924 awarded by the University of Toronto (2021)
- Samuel Beatty In-Course Scholarship – CA\$1,000 awarded by the University of Toronto (2021)
- NSERC Undergraduate Student Research Award – CA\$5,600 awarded by the Government of Canada (2021)
- Drew Thompson Scholarship – CA\$700 twice awarded by the University of Toronto (2019, 2020)

SERVICE AND OUTREACH

- Designed the new MATH 190 class, a requirement for all math majors, Stanford University (2026)
- Graduate Math Outreach Organization president, Stanford University (2025 – 2026)
- Graduate Math Outreach Organization financial officer, Stanford University (2024 – 2025)
- Directed reading program mentor, Stanford University (2021 – 2025)
- Host of open office hours, providing guidance to young mathematicians, Stanford University (2022 – 2026)

ADDITIONAL INFORMATION

- I am fluent in the Wolfram Language, Python (PyTorch), English, and French, and intermediate in Lean and Spanish.
- I am an adept Codex user for mathematical research, technical writing, and computational workflows.
- I am an American, Canadian, and French citizen.
- I enjoy writing, swimming outdoors, and using my phone as little as possible.