Grayson R. Davis

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Education

Courant Institute of Mathematical Sciences (NYU) — New York, NY, USA
Ph.D. in Mathematics — 2024 - 2029 *(expected)*

- Research interests: PDEs, applied analysis, computer-assisted proofs
- GPA: 4.00/4.00

Simon Fraser University (SFU) — Burnaby, BC, Canada
BSc in Mathematics (Honours First Class with Distinction) — 2020 - 2024

- Thesis: Finite Element Approximation of the Modified Steklov-Maxwell Eigenproblem
- Advisor: Nilima Nigam
- Degree Award: Dean of Science Convocation Medal
- GPA: 4.25/4.33

Research and Readings

Self-Similar Analysis and Computer-Assisted Proofs (NYU)
Supervisor: Tristan Buckmaster — January 2025 – *Present*

- Presented material from *Singularities: Formation, Structure, and Propagation* (Eggers & Fontelos, 2015) to build foundational understanding of self-similar analysis.
- Implemented interval arithmetic exercises using SageMath.
- Analyzed the stability of self-similar solutions to Burgers' equation using energy estimate methods that extend to broader PDE contexts.

Recent Developments in the Analysis of Nonlinear Kinetic Equations (SFU)
Supervisor: Weiran Sun — May 2024 – August 2024

- Investigated kinetic Schauder estimates with applications to the Landau equation.
- Studied regularity of solutions to a kinetic Fokker-Planck equation initial data that has a logarithmic modulus of continuity.
- Proved a time-integrable logarithmic-type decay estimate for the fundamental solution of the constant-coefficients problem.

Spectral Geometry of the Steklov-Maxwell System (SFU)
Supervisor: Nilima Nigam — May 2023 – December 2023

- Analyzed theoretical and numerical properties of a Steklov-type eigenvalue problem for Maxwell's equations.
- Compared conforming and non-conforming finite elements in computing the Steklov-Maxwell spectrum.
- Synthesized findings into a comprehensive undergraduate thesis.

Teaching

MATH-UA 131: Mathematics for Economics I (NYU)
Teaching Assistant — September 2025 - December 2025

MATH 150: Calculus I with Review (SFU)
Calc Connect Peer Mentor (Volunteer) — September 2022 - April 2024

MATH 322: Complex Variables (SFU)
Teaching Assistant (Only grading and quiz design) — September 2024 - December 2024

Selected Awards

- **SFU Math 2023 Undergraduate Research Prize** (SFU) August 2024
  Given in recognition of excellence in mathematical research at the undergraduate level.
- **Dean of Science Convocation Medal** (SFU) June 2024
  Awarded by the Dean of Science to one graduating student whose grades put them in the top five per cent of their class.
- **NSERC Undergraduate Student Research Award** (SFU) March 2024
  Grant from the Natural Sciences and Engineering Research Council of Canada (NSERC).
- **Department of Mathematics Award** (SFU) October 2023
  Given to students who are passionate about their studies and make positive contributions to the SFU community.
- **Scotiabank Student Scholarship in the Faculty of Science** (SFU) October 2023
  Granted to a student who exemplifies the aspects of a well-rounded student scholar.
- **NSERC Undergraduate Student Research Award** (SFU) March 2023
- **Dr. John Abreu Memorial Award in Mathematics** (SFU) February 2023
  Awarded to students who demonstrate a passion for their studies and community service.

Activities

Student Analysis Seminar (NYU)
Co-founder & Co-organizer September 2025 - *Present*

Courant Student Organization (NYU)
Vice President September 2025 - *Present*

NSF-FRG Summer School on Fluids and Computer Assisted Proofs (Princeton University)
Participant August 2025

Courant DEI Reading and Outreach Group (NYU)
Discussion Leader November 2024

CECM Computational Math Day (SFU)
Participant May 2023

Courses and Skills

Coursework: Measure Theory, Functional Analysis, Complex Analysis, Partial Differential Equations, Linear Algebra, Fluid Dynamics, Topology, Dynamical Systems, Galois Theory, Group Theory, Commutative Algebra and Algebraic Geometry.

Programming: `LaTeX`, `Python`, `MATLAB`, `Maple`, `FreeFem++`