

Education:

<i>University of Waterloo</i> - Candidate for PhD in Mathematics	Expected: Sept. 2027
<i>McGill University</i> - MSc. Mathematics	Apr. 2023
<i>University of Waterloo</i> - BSc. Mathematical Physics	Apr. 2021

Employment History:

<i>Tutte Institute for Mathematics and Computing</i> Strategic Researcher - Data Science	May-Aug. 2024
<ul style="list-style-type: none"> • Invented new techniques for analyzing changes in the topics of a document corpus over time. • Implemented my algorithm in a public python library. (github.com/tutteinstitute/temporal-mapper) • Collaborated with other researchers and with clients to improve and tailor my work to their needs. 	
<i>Communications Security Establishment</i> Cryptographic Scientist	May-Aug. 2023
<ul style="list-style-type: none"> • Read, analyzed, and summarized current research on homomorphic encryption. • Presented findings to both researchers and non-technical administrators. • Collaborated with other researchers and with clients to improve and tailor my work to their needs. 	
<i>University of Waterloo</i> Undergraduate Research Assistant, under Dr. Ruxandra Moraru	May-Aug. 2020
<ul style="list-style-type: none"> • Conducted novel research towards understanding the symplectic structure of co-Higgs bundles. • Read, summarized and applied the results from previous works in the area to develop new results. • Adapted to self-guided research conditions imposed due to the coronavirus. 	
<i>Institut National de la Recherche Scientifique</i> Undergraduate Research Assistant, under Dr. Roberto Moriandotti	May-Aug. 2019
<ul style="list-style-type: none"> • Studied the use of mathematical optimization to develop and improve optical experiments. • Developed a mathematical procedure to analyze the results of our optimization process and quantify the magnitude of errors from physical non-idealities. • Verified the procedure both with mathematical proof and monte carlo simulations. 	
<i>Institute for Quantum Computing</i> Undergraduate Research Assistant, under Dr. Raffi Budakian	Jan-Apr. 2019
<ul style="list-style-type: none"> • Developed a novel technique to measure the electrical transfer function of an experimental system. • Learned about nuclear magnetic resonance and spin physics, as applied to quantum information. • Worked with microscale and vacuum-safe components, including computer assisted design and assembly for use in the experiment. 	
<i>Institute for Quantum Computing</i> Undergraduate Research Assistant, under Dr. Rajibul Islam	Jan-Apr. 2018
<ul style="list-style-type: none"> • Constructed a system to manipulate the frequency spectrum of laser light. • Improved my personal organization, problem solving and laboratory skills. • Presented and explained my work to peers in group meetings and conferences. 	

Academic Contributions:

Publications

Improving Mapper's Robustness by Varying Resolution According to Lens-Space Density, Ruscitti & McInnes, arXiv preprint, 2025. arxiv.org/abs/2410.03862

Inverse Design of Photonic Systems, MacLellan et. al., Laser & Photonics Reviews, 2024.
doi:10.1002/lpor.202300500

Conference Presentations

Degeneration of Holomorphic Sections to Bohr-Sommerfeld Points Nov 2024
CMS Winter Meeting 2025, Canadian Mathematics Society.

The Verlinde formula for flat $SU(2)$ connections using a toric degeneration. Dec. 2022
AARMS-CMS Graduate Student Poster Session, Canadian Mathematics Society.

Adaptive Optics for Ion-Addressing in an Ion Trap Quantum Simulator Apr. 2018
Physics Undergrad Conference 2018, Western University.

Grants and Awards:

Postgraduate Doctoral Scholarship (NSERC PGS-D) Jan 2025-Sept 2027
\$40,000 per year, held at the University of Waterloo

Ontario Graduate Scholarship Sept 2024-Dec 2024
\$15,000, held at the University of Waterloo.

Women in Math Mentorship Award Jan 2024
\$1,000, awarded for mentoring in the directed reading program.

Undergraduate Student Research Award (NSERC) Apr 2020
\$4,500, held at the University of Waterloo

Undergraduate Student Research Award (NSERC) Apr 2019
\$4,500, held at the Institut National de la Recherche Scientifique

Undergraduate Student Research Award (NSERC) Jan 2019
\$4,500, held at the University of Waterloo

Confucius Institute Scholarship Sept 2018
\$1,000, given for scholarship in a Chinese study abroad program.

Service and Teaching Activities:

Singular Learning Theory Seminar - Founded and organized an interdisciplinary research seminar.

Algebraic Geometry Seminar - Organized a departmental working seminar, see the seminar webpage.

Directed Reading Program - Mentored undergraduates to complete expository reading projects in math.

Math Tutorial Center - Tutored students in first and second year math courses.

Teaching Assistant - Prepared and gave weekly tutorials, graded assessments, and held office hours.

Other Relevant Skills:

Experienced in computer programming in Python and C.

Experienced with Unix, including basic system administration and server management.

Con conversationally proficient in French and Mandarin Chinese.