

Kaleb Ruscitti

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Education:

University of Waterloo

Candidate for Doctor of Mathematics

Expected Graduation: April 2027

McGill University

Master of Science in Mathematics

University of Waterloo

Bachelor of Science in Mathematical Physics, minor in Pure Mathematics

Employment History:

Communications Security Establishment

May-Aug 2023 (4 mo.)

Cryptographic Scientist

- Read, analyzed, and summarized current research on homomorphic encryption.
- Presented findings to both researchers and non-technical administrators.
- Developed prototype software and contributed to internal software libraries.

University of Waterloo, Department of Pure Mathematics

May-Aug 2020 (4 mo.)

Undergraduate Research Assistant under Dr. Ruxandra Moraru

- 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 coronavirus.

Institut National de la Recherche Scientifique

May-Aug 2019 (4 mo.)

Undergraduate Research Assistant under Dr. Roberto Moriandotti

- 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.

Institute for Quantum Computing

Jan-April 2019 (12 mo.)

Undergraduate Research Assistant under Dr. Raffi Budakian

- 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.

Jan-April 2017, 2018

Undergraduate Research Assistant under Dr. Rajibul Islam.

- 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.

Grants and Awards:

2x Undergraduate Student Research Award, NSERC

Jan 2019, April

2020

\$4,500, held at the University of Waterloo.

Undergraduate Student Research Award, NSERC

April 2019

\$4,500, held at the Institut National de la Recherche Scientifique

Confucius Institute Scholarship, Confucius Institute in Waterloo

Sept 2018

\$1,000, given for scholarship in a Chinese study abroad program.

Presentations:

“The Verlinde formula for flat $SU(2)$ connections using a toric degeneration”

- AARMS-CMS Graduate Student Poster Session

“Adaptive Optics for Ion-Addressing in an Ion Trap Quantum Simulator”

- PhUnC 2018, Western University.

Extracurricular Activities:

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

Mathematical Physics Seminar - Organized a group of students who meet to present and discuss papers.

Physics Club - Elected as a communications executive

Ballroom Dancing - Both as a competitor and as a club communications executive.

Other Relevant Skills:

Experienced in computer programming in Python, C++ and LabVIEW

Experienced with symbolic and numeric mathematical computations.

Proficient in French and Mandarin Chinese.