

Kaleb Ruscitti

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Education:

University of Waterloo

Candidate for Bachelor of Mathematical Physics, minor in Pure Mathematics

Expected Graduation: April 2021

Relevant Coursework:

- Physics: Optics, Thermal Physics, Intro to Quantum Mechanics, Electricity and Magnetism 2
- Maths: Ordinary Diff. Equations 2, Real and Complex Analysis, Linear Algebra 2, Differential Geometry

Employment History:

Institut Nationale de la Recherche Scientifique (4 mo.)

May-Aug 2019

Undergraduate Research Assistant under Dr. Roberto Moriandotti

- Studied the use of machine learning to develop novel optical experiments.
- Created Monte Carlo simulations for determining the experimental robustness of our theoretical results.

Institute for Quantum Computing (12 mo.)

Jan-April 2019

Undergraduate Research Assistant under Dr. Raffi Budakian

- Developing a novel technique to measure the electrical transfer function of an experimental system.
- Learning about nuclear magnetic resonance and spin physics, as applied to quantum information.
- Working 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.

- Completed a major laboratory project that will be used in future experiments.
- Developed fundamental knowledge of optics and electronics, and applied it to create functional lab equipment.
- Presented and explained my work to peers in group meetings and conferences.

Projects:

Digital Holographic Beam-shaping for Ion Addressing

Quantum Info. with Trapped Ions Group (Dr. Islam) at the Institute for Quantum Computing

- Implemented a scheme for robust, in-situ, quick and fully programmable laser beam-shaping and optical aberration correction.
- Constructed the required equipment myself, including the optics, circuits and machining the mount.

- Developed and published a software package in Python to facilitate the implementation of this scheme on any spatial light modulator.

Micromechanical Characterization and Correction of Electrical Transfer Function (Ongoing)

Budakian Group (Dr. Budakian) at the Institute for Quantum Computing

- Developing a procedure and equipment for making precise measurements of the electrical transfer function of a system cooled to 4 kelvin, in high vacuum.
- Implementing all aspects of the project including design of the components, developing the measurement procedure and how to extract the transfer function from the data.

Grants and Awards:

Undergraduate Student Research Award, NSERC

Jan 2019

\$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

Presentations:

“Adaptive Optics for Ion-Addressing in an Ion Trap Quantum Simulator” - PhUnC 2018, Western University.

Extracurricular Activities:

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. (MATLAB, Sage)

Proficient in French and Mandarin Chinese.