Thomas Alexander

thomasalexander2718@gmail.com | 226.505.1869 | t4alexan@uwaterloo.ca

EDUCATION

UNIVERSITY OF WATERLOO
PhD in Quantum Information/Physics
Jan 2018 - Deferring | Waterloo, ON

UNIVERSITY OF WATERLOO
MSc in Quantum Information/Physics
Sept 2014 - Dec 2017 | Waterloo, ON
GPA: 89%

MOUNT ALLISON UNIVERSITY
Honours in Physics
double minor
Mathematics/Computer Science
Sept 2010 - May 2014 | Sackville, NB
First Class Honours
GPA: 3.7

LINKS

Github:// **whitewhim2718**
LinkedIn:// **thomasalexander2718**
Quora:// **Thomas-Alexander-4**

COURSEWORK

GRADUATE
Quantum Information Theory
Open Quantum Systems
Nanoelectronic Devices
Experimental Quantum Computing
Quantum Mechanics

UNDERGRADUATE
Object Oriented Programming
Data Structures and Algorithms
Algorithm Analysis
Vector Analysis
Advanced Linear Algebra
Statistical Mechanics
Statistics
Discrete Mathematics
Complete Physics Curriculum

SKILLS

PROGRAMMING
Over 5000 lines:
Python • Mathematica
LaTeX
Over 1000 lines:
Java • Scala • Javascript/Node
Familiar:
C • Matlab •HTML • Shell
Tensorflow • MongoDB • MySQL

RESEARCH

IQC/TQT CORY LAB | Researcher
Sep 2014 – Dec 2017 | Waterloo, ON
Studied under **Prof David Cory** director of the Transformitive Quantum Technologies program in the field of experimental Quantum Information.

- Developed new Bayesian adaptive experimental design algorithms for continuous outcome parameter estimation and demonstrated near order of magnitude in wall clock experiment time.
- Obtained conclusive evidence in favor of proposed hyperpolarization mechanism in phosphorus defects in silicon-28.
- Contributed to development and release of **QInfer** a Bayesian parameter estimation library using particle filtering.
- Proposed new metric for direct comparison of arbitrary neutron interferometer configurations information content.

IQC CORY LAB | Undergraduate Researcher
May 2013 – August 2013 | Waterloo, ON

- One of thirty students out of 400 applicants selected to attend the Undergraduate School on Experimental Quantum Information Processing.
- Led the development and implementation of NI-Engine, a software library used to interface with hardware, design, schedule and execute experiments for the neutron inteferometer at the NIST research nuclear reactor.
- Designed Bayesian adaptive experiment selection strategies for Hamiltonian parameter estimation for use with neutron interferometers.

EXPERIENCE

MOUNT ALLISON UNIVERSITY | Backend Developer
May 2014 - August 2014 | Sackville , NB

- Developed RESTful API for Android application **Iron Tracker** with Python/Flask.
- Developed Python CLI for interaction with API and easy integration with Android application.

G2 RESEARCH (TRACK GROUP) | Software Engineering Intern
June 2012 – Sep 2012 | Halifax, NS

- Developed prototype software for tracking cellular users via confidential Telecom tower data in C#.
- Correlated timestamped calls with tower locations, headings, signal strengths.

SELECTED AWARDS

2017	1st/30 place Citadel Correlation One Datathon, Waterloo
2014-2017	CREATE NSERC scholarship
2014-2016	UW Varsity Athlete (Rugby)
2012	4th/30 ACM Atlantic regional qualifiers

SELECTED TALKS

Optical hyperpolarization and inductive readout of 31P donor nuclei in natural abundance single crystal 29Si DAMOP | 2016 | Providence, RI
Ionization and Inductive Detection of Phosphorus Defects in Isotopically Purified Silicon
Google-IQC Conference | 2015 | Kitchener , ON

PUBLICATIONS

[1] C. Granade, C. Ferrie, I. Hincks, S. Casagrande, T. Alexander, J. Gross, M. Kononenko, and Y. Sanders. QInfer: Statistical inference software for quantum applications. *Quantum*, 1:5, Apr. 2017.