

Caleb Rotello

RESEARCH INTERN · QUANTUM APPLICATIONS

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Education

Colorado School of Mines

M.S. IN QUANTUM ENGINEERING

Golden, Colorado

May 2021 - Aug. 2022

- Thesis title: *Symmetry Protected Subspaces in Quantum Simulations*
- Advisor: Dr. Eliot Kapit, Associate Professor
- 4.0 GPA

Colorado School of Mines

B.S. IN COMPUTER SCIENCE

Golden, Colorado

Aug. 2018 - May 2021

- 3.78 GPA, 4.0 Major GPA
- Transamerica C-MAPP Scholar, 2020

Skills

Quantum Computing	Quantum code execution, NISQ algorithms, Noise mitigation, Mathematical physics
Programming Languages	C++, Python, OCaml, R, Matlab, Mathematica
Hardware	7K Cryostat, SQUID, Class 1000 clean room, Photolithography, Evaporator, VNA calibration & measurement

Writing

Automated detection of symmetry-protected subspaces in quantum simulations

arXiv preprint

CALEB ROTELLO, ERIC B. JONES, PETER GRAF, ELIOT KAPIT

Feb. 2023

Work Experience

National Renewable Energy Laboratory

QUANTUM COMPUTING RESEARCH INTERN

Golden, Colorado

Nov. 2021 - Present

- Discovered and published algorithms to identify symmetry protected subspaces in quantum systems
- Wrote efficient classical and quantum software
- Reviewed quantum approaches to optimizing stochastic systems
- Collaborated with researchers across disciplines

Colorado School of Mines

GRADUATE RESEARCH ASSISTANT

Golden, Colorado

May 2021 - Aug. 2022

- Submitted loop quantum gravity simulation code to Google's Sycamore processor
- Implemented quantum optimization algorithms for research
- Wrote and successfully defended a thesis

Invitae

BIOINFORMATICS INTERN

Boulder, Colorado

May 2021 - Aug. 2021

- Created analysis code for research on acute myeloid leukemia
- Implemented ALPHABETR algorithm to pair RNA alpha and beta sequences across multiple cells
- Collaborated with biologists and machine learning experts to develop technical goals
- Wrote and refactored R and Python code

ArcherDX

RESEARCH & DEVELOPMENT SOFTWARE INTERN

Boulder, Colorado

May 2020 - Aug. 2020

- Discovered algorithm to efficiently detect DNA sample errors with lexical analysis
- Contributed to AMP chemistry analysis software for cancer genomics
- Wrote and refactored C++ and Python code with test-driven development

Contracting with County Police Departments

Denver, Colorado

HEALTH & WELLNESS APP DEVELOPER

Jun. 2019 - Dev. 2019

- Wrote secure API calls to AWS Lambda
- Developed application backend to securely handle personal information
- Worked with non-technical professionals to determine development goals
- App development in XCode

Valor Christian High School

Highlands Ranch, Colorado

IT INTERN

Dec. 2017 - Dec. 2018

- Planned projects and supervised interns
- Administration of 640 Apple devices, from hardware maintenance to software deployment
- Directed setup and maintenance with Aerohive wireless access points
- Resolved user and helpdesk tickets

Honors

2022 **1st Place**, Womanium Hackathon, IBM Challenge *Humans vs Quantum Computers*

Online

2020 **4th Place**, HackCU VI Hackathon

CU Boulder

2019 **Semifinalist**, RASC-AL

NASA

Extracurricular Activity

2011-17 **Eagle Scout**, Boy Scouts of America

Troop 794, Colorado

2021-22 **Vice President**, Creative Writing Club

Mines

2022 **Poetry Editor**, *High Grade Art Journal*

Mines