Anthony Polloreno, Ph.D.
Information Theory, Computer Science and Software Engineering gmail, github, twitter: ampolloreno

Education (3)

August 2019 - May 2023	Ph.D., Physics *Thesis Title: Characterizing Quantum Devices Using the Principles of Quantum Information* University of Colorado, Boulder
August 2019 - May 2022	M.S., Physics University of Colorado, Boulder
August 2012 - May 2016	B.A., Computer Science, Physics, and Pure Mathematics University of California, Berkeley

Work Experience (2)

April 2019 - August 2019	Software Engineer at Ψ-inf Software engineering consultant. Built infrastructure for scientific computing companies. Developed tools for storing, structuring and retrieving data from various experiments (SQLAlchemy).
May 2016 - August 2019	Software Engineer at Rigetti Quantum Computing Calibrated and characterized superconducting quantum computers ($\leq$ 32 qubits). Developed, tested and simulated efficient routines for device bring-up and characterization (Julia). Maintained and developed the software suite for experiments, including APIs for easily accessing and using calibrated pulses and pulse sequences (Python). Developed instrument drivers and signal processing routines, e.g. matched filtering of RF signals (C++). Built functionality for the compiler and simulator, implemented randomized benchmarking and provided APIs to access them (Lisp). Developed customer facing code to access the quantum computer (pyQuil), including implementing standard algorithms (Grove).

Research Experience (6)

May 2021 - May 2023	Graduate Student Intern at Sandia National Laboratories *Quantum Characterization* Research with Robin Blume-Kohout, Kevin Young and Timothy Proctor to identify physical quantities that are predictive of error corrected performance. Working at the interface of quantum error correction and quantum characterization. Work funded by Sandia and QISE-NET grant.
August 2019 - May 2023	Graduate Student at JILA and University of Colorado, Boulder *Quantum Computation, Metrology, Characterization and Error Correction* Graduate student in the Smith group, focusing on quantum metrology, computation and characterization.
September 2018 - October 2018	Visiting Researcher at UT Austin *Random Quantum Circuits* Researching properties of random quantum circuits with Scott Aaronson. In particular, trying to prove that the probabilities for measuring different computational basis vectors following a random circuit are Porter-Thomas distributed.
June 2015 - January 2016	Student Intern at Sandia National Laboratories *Quantum Computation and Control* Worked with Kevin Young to develop techniques for using quantum optimal control to average away coherent error using gradient-based methods (GRAPE) and optimization.
July 2013 - July 2015	Student Assistant at Lawrence Berkeley National Laboratory *Beamline Optics, Reflection Zone Plates*

Worked with Dmitriy Voronov to develop elliptical grating patterns called reflection zone plates which allow for more efficient beamline signal transmission in the Advanced Light Source. Used Python to generate patterns for the gratings as .cif files for use by electron beam and laser lithography machines.

January 2013 - May 2013

Undergraduate Research Apprenticeship at U.C. Berkeley
Animal Flight Laboratory, Hummingbird Flight
Worked with graduate student Marc Badger to investigate how hummingbirds navigate natural vegetation. Learned about avian flight as well as animal handling, and was introduced to basic experimentation techniques, Arduino usage, and Mathematica.

Awards and Scholarships (5)

April 2021	NASA Space Technology Graduate Research Opportunity (NSTGRO) Fellowship
February 2021	QISE-NET Award (Cohort 4)
Dec 2019	C.U. Boulder Domestic Graduate Travel Grant
Dec 2014	Pomerantz Physics Scholarship
August 2012	U.C. Berkeley Regents' and Chancellor's Scholarship

Patents (2)

1.
2.

Publications (11)

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.

Talks/Posters (8)

1.
2.
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4.
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6.
7.
8.

Teaching Experience (6)

January 2020 - June 2020

Grader for Physics 4230 at C.U. Boulder
Graded homework and quizzes for upper division, thermodynamics and statistical mechanics with Oliver DeWolfe.

January 2020 - June 2020

Teaching Assistant for Physics 2020 C.U. Boulder

Taught two sections of introductory experimental physics for non-majors. Course taught by Colin West.

August 2019 - December 2019

Teaching Assistant for Physics 1110 and 1115 at C.U. Boulder

Taught three sections of introductory general physics, one for majors. Led tutorial sections introducing students to ideas in kinematics and dynamics and graded homework. Course taught by Daniel Bolton, Cindy Regal, and Shijie Zhong.

August 2019 - December 2019

Grader for Physics 4410 at C.U. Boulder

Graded homework and quizzes for upper division, second-semester quantum mechanics with Andreas Becker.

June 2014 - August 2014

Undergraduate Student Instructor for CS70 at U.C. Berkeley

Worked as an undergraduate student instructor under James Cook for the summer offering of a course in discrete mathematics and probability in the Computer Science department. Taught a discussion section of 10 students twice a week, held office hours, wrote homework and exam problems, and ran review sessions.

January 2014 - May 2014

Reader for CS61A at U.C. Berkeley

Graded homework, tests, and projects and held office hours for the introductory Computer Science course, taught by Paul Hilfinger.