RYAN HILL

Chief Technology Officer, qBraid

@ ryanhill@qbraid.com
🌐 ryanhill.tech
in ryan-james-hill
○ ryanhill1
☰ ryanhill1

ABOUT ME

I am a physicist, software developer, and engineering team leader passionate about quantum computing and cloud HPC. I received my Master's in engineering physics at Cornell University, where my research focused on quantum machine learning, specifically quantum neural networks. As an undergraduate at Cornell, I studied physics and computer science and was a member of the varsity soccer team.

In addition to my executive role at qBraid, I am a maintainer and lead developer of the qBraid-SDK, and an active code/community contributor to various other quantum open-source projects including PennyLaneAI, Qiskit, and Amazon Braket. Professionally, I am driven to apply my experience across technical roles, program management, and deep tech strategic partnerships to grow the quantum ecosystem, and accelerate research and development in the field of quantum computing.

EDUCATION

Master of Engineering, Applied and Engineering Physics | Cornell University

📅 01 2020 – 12 2020   📍 Ithaca, NY

- *Thesis*: Supervised Machine Learning in Quantum Feature Spaces with Reservoir-Inspired Applications

Bachelor of Arts, Physics | Cornell University

📅 01 2017 – 12 2019   📍 Ithaca, NY

- *Concentration*: Computer Science

EXPERIENCE

CTO, Software Engineer | qBraid

📅 04 2021 – Present   📍 Chicago, IL

- Quantum computing, quantum software, cloud computing
- Leading development of qBraid Lab, a cloud-based IDE/platform highly optimized for quantum computing.
- Lead developer of the qBraid SDK, a Python toolkit for cross-framework abstraction, transpilation, and execution of quantum programs.

Research Assistant | McMahon Lab

📅 08 2019 – 05 2021   📍 Ithaca, NY

- Quantum computing, machine learning, neuromorphic computing
- Contributed to developing general-purpose HHL-based quantum reservoir computing algorithm.
- Investigated alleviations to exponentially vanishing gradients (i.e. barren plateaus) in QNNs.
- Supervised by Professor Peter McMahon, Cornell University School of Applied and Engineering Physics

Research Assistant | Cordes Research Group

📅 06 2019 – 12 2019   📍 Ithaca, NY

- Radio astronomy, signal processing, machine learning
- Added noise-filtering module to "black box" scientific software pipeline to better identify fast radio transients with a goal to discover new pulsars. Namely, built and trained CNN to classify various types of radio frequency interference.
- Supervised by Professor James M. Cordes, Cornell University Department of Astronomy

Research Assistant | Wilson Synchrotron Lab

📅 02 2019 – 06 2019   📍 Ithaca, NY

- Accelerator technology, physics of beams, high energy physics
- Edited, tested, ran Fortran simulations for touschek and residual gas scattering at Cornell-BNL Test Accelerator.
- Supervised by Professor Georg Hoffstaetter, Cornell University Department of Physics

EVENTS

Mentor | BIG Q Hackathon by Chicago Quantum Exchange and QuantX

📅 09 29 2023 – 10 02 2023   📍 Chicago, IL

- Quantum competition included a Technical Phase (Days 1 and 2) and a Business Phase (Days 3 and 4). Served as technical mentor alongisde business mentor from J&J to guide "hackers" in QML project with healthcare application.

Presenter | IBM Quantum Startup Developer Forum

📅 09 12 2023 – 09 14 2023   📍 Yorktown Heights, NY

- Represented qBraid as presenter at invite-only quantum developer forum held in person at IBM Thomas J. Watson Research Center. Participated in partner activities over three-day event to give feedback on upcoming Qiskit features.

Speaker | Qiskit DemoDays

📅 08 10 2023 – 08 10 2023   📍 Virtual

- Qiskit DemoDays are public meetings where Qiskit developers share recent and upcoming Qiskit features, bugfixes, and improvements. Was invited to demo the qBraid-SDK following its acceptance into the Qiskit Ecosystem.

Speaker | KNUST Quantum Computing Workshop

📅 05 17 2023 – 05 17 2023   📍 Virtual

- Lead practical "Quantum Computing with qBraid Lab" at Ghana 's first-ever quantum computing and programming workshop, hosted by the Dept. of Physics, Kwame Nkrumah University of Science and Technology (KNUST).

Speaker | Xanadu QHack

📅 02 21 2023 – 02 21 2023   📍 Virtual

- Gave talk "Improving Quantum Workflows with qBraid Lab" at Xanadu's annual quantum hackathon, QHack.

Speaker, Mentor | MIT Interdisciplinary Quantum Hackathon (iQuHACK)

📅 01 27 2023 – 01 29 2023   📍 Boston, MA

- Speaker and mentor at iQuHACK, annual quantum hackathon sponsored by MIT iQuISE. Event included 300 in-person attendees and over 1.2K remote participants. Gave final talk of opening ceremonies, "Introduction to qBraid Lab".

Exhibitor | SC22: International Supercomputing Conference

📅 11 13 2022 – 11 18 2022   📍 Dallas, TX

- Represented qBraid as an exhibitor at the Amazon booth at The International Conference for High Performance Computing, Networking, Storage, and Analysis hosted at Kay Bailey Hutchison Convention Center in Dallas, Texas.

Speaker, Mentor, Judge | qBraid HAQS

📅 10 21 2022 – 11 05 2022   📍 Virtual

- Speaker, mentor and judge at qBraid quantum computing hackathon. Authored and evaluated submissions to QML challenge and qBraid Open challenge. Gave two-part talk "HAQS Challenges Overview" and "Introduction to VQCs".

Panelist | Qiskit Fall Fest: Mexico

📅 10 18 2022 – 10 18 2022   📍 Virtual

- One of five panelists for programmed discussion "Open Source in Quantum Computing" for Qiskit Fall Fest event hosted by the Computing Research Center of the National Polytechnic Institute in Mexico City, Mexico.

Attendee | IBM Quantum Startup Developer Forum

📅 08 18 2022 – 08 19 2022   📍 San Jose, CA

- Represented qBraid at invite-only quantum developer forum held in person at IBM Research - Almaden. Discussed current and upcoming features of Qiskit and shared experience using IBM Quantum's stack.

Panelist | UChicago-France Exploratory Quantum Workshop

📅 04 27 2022 – 04 28 2022 📍 Paris, France

- One of three panelists for programmed discussion "Building a Quantum Startup" on day two of "UChicago/CQE - France Exploratory Workshop on Quantum Science, Engineering and Innovation", at the UChicago Center in Paris.

Speaker, Mentor, Judge | Quantum Coalition Hackathon (QC Hack)

📅 04 04 2022 – 04 10 2022 📍 Virtual

- Speaker, mentor and judge at Yale x Stanford x Berkeley Quantum Coalition Hackathon. Gave talk "Introduction to qBraid Platform". Authored and evaluated submissions to OpenQASM Parser Challenge.

Judge | MIT Interdisciplinary Quantum Hackathon (iQuHACK)

📅 01 28 2022 – 01 30 2022 📍 Virtual

- Judge at MIT Quantum Hackathon. Evaluated submissions to Microsoft x IonQ challenge.

Speaker | Chicago Quantum Exchange Seminar Series

📅 01 29 2022 – 01 29 2022 📍 Chicago, IL

- Keynote speaker for final event in the "Introduction to Quantum Computing Platforms and Software" seminar series, sponsored by the UChicago Research Computing Center and Quantum Society.

HONORS & AWARDS

🏆 **Quantum World Congress Pitch Competition, 1st Place** (qBraid, 2022)
Media: Meet the winners of the first Quantum World Congress' $25K pitch competition

🏆 **Q2B Startup Pitch Competition, 2nd Place** (qBraid, 2021)
Media: Duality Cohort 1 Startup qBraid Takes Second at Q2B Startup Pitch Competition

🌐 **Duality Accelerator, Cohort 1** (qBraid, 2021)
Media: Duality Quantum Accelerator Accepts Six Startups into Inaugural Cohort

🏛 **Centennial Conference Academic Honor Roll** (Haverford College, 2016)
Nominated by coaches and selected by merit of GPA for outstanding academic achievement as student-athlete.

PUBLICATIONS

- Ville Bergholm, Josh Izaac, Maria Schuld, Christian Gogolin, Shahnawaz Ahmed, Vishnu Ajith, M. Sohaib Alam, Guillermo Alonso-Linaje, B. Akash- Narayanan, Ali Asadi, Juan Miguel Arrazola, Utkarsh Azad, Sam Banning, Carsten Blank, Thomas R Bromley, Benjamin A. Cordier, Jack Ceroni, Alain Delgado, Olivia Di Matteo, Amintor Dusko, Tanya Garg, Diego Guala, An- thony Hayes, **Ryan Hill**, [+44]. "Pennylane: Automatic differentiation of hybrid quantum-classical computations" (2018). arXiv.1811.04968

SKILLS & TOOLS

Quantum Software

Cirq Amazon Braket Qiskit OpenQASM

qBraid-SDK Transpiler Compiler Runtime

Pennylane QML Hybrid Algorithms cuQuantum

Classical Software

Git Docker K8s Helm Scripting OOP FP

NoSQL MongoDB REST APIs Node.js Linux

CI/CD AWS GCP Jupyter Figma reST ML

LANGUAGES

6+ yrs: Python

4+ yrs: Bash

3+ yrs: Go

2+ yrs: JavaScript
OCaml

1+ yrs: C++
Java