



RYAN HILL

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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, qBraid-QIR and an active code/community contributor to various other quantum open-source projects including Qiskit, Amazon Braket, and PennyLaneAI. 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 Co.

⌚ 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 qBraid SDK: SW toolkit for cross-FWK abstraction, transpilation, execution of quantum programs.

Open Quantum Benchmark Committee Member | Unitary Fund (Metriq)

⌚ 04 2024 – Present

📍 Virtual

- Quantum benchmarking, platform, non-profit
- Guided the strategic direction of Metriq, a Unitary Fund platform for quantum technology benchmarks, focusing on performance tracking across different computing platforms, software stacks, and workloads over time.
- Contributed expertise in quantum computing, specifically in simulators and compilers, to enhance Metriq's ability to benchmark and compare technology performance, ensuring robust and meaningful data for users.

Mentor | Quantum Open Source Foundation (QOSF)

⌚ 10 2023 – Present

📍 Virtual

- Quantum software, open-source, non-profit, qir
- The QOSF Mentorship Program connects early-career quantum enthusiasts with mentors in academia and industry.
- Cohort 8: lead 3-person project team in developing qBraid-QIR (Quantum Intermediate Representation), an LLVM-based quantum compiler integration for the qBraid-SDK.

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

Exhibitor | MIT Research and Development Conference

 11 19 2024 – 11 19 2024

 Cambridge, MA

- Invited to represent qBraid as an exhibitor with a booth at the annual MIT Research and Development Conference, hosted by the MIT Industrial Liaison Program (ILP).

Mentor | IQuHACK: IonQ Remote Challenge

 02 02 2024 – 02 04 2024

 Virtual

- Built REST API to facilitate IonQ Remote Challenge as part of MIT’s annual quantum hackathon. Managed development of real-time leader board hosted on qBraid. Served as one of three mentors to over 300 remote participants.

Speaker | Qiskit Fall Fest: Latino

 10 30 2023 – 10 30 2023

 Virtual

- Gave talk "Improving Quantum Workflows with qBraid Lab" at event hosted by COF Alumni USB, an alumni initiative seeking to contribute to careers in Physics at the University Simón Bolívar (USB) and other universities in Venezuela.

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 alongside 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 iQuSE. 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.

PAPERS & PUBLICATIONS

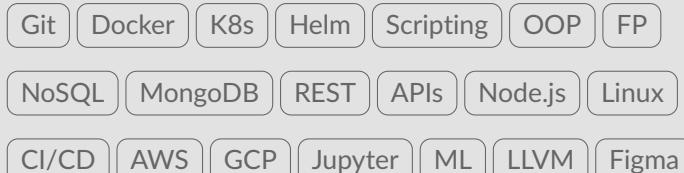
- Ryan Hill, Harshit Gupta, Ricky Young, Kanav Setia. "qBraid-SDK: Platform-agnostic quantum runtime framework" (2024). <https://doi.org/10.5281/zenodo.12627596>
- Mainak Roy, Jessica John Britto, **Ryan Hill**, Victor Onofre. "Simulating open quantum systems using noise models and NISQ devices with error mitigation" (2024). arXiv.2401.06535
- 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 Gual, An- thony Hayes, **Ryan Hill**, [+44]. "Pennylane: Automatic differentiation of hybrid quantum-classical computations" (2022). arXiv.1811.04968
- **Ryan Hill**, Maxwell Anderson, Chengji Liu, Logan Wright. "A Practical Introduction to Echo State Networks using Python" (2021).
- **Ryan Hill**, Nam Mannucci, Andrew Yates, Logan Wright. "Supervised Machine Learning in Quantum Feature Spaces with Reservoir-Inspired Applications" (2020).

SKILLS & TOOLS

Quantum Software



Classical Software



LANGUAGES

7+ yrs: **Python**

5+ yrs: **Bash**

4+ yrs: **Docker**

3+ yrs: **JavaScript**

2+ yrs: **OCaml**

1+ yrs: **C++**
Java