QED-C Workforce TAC Panel: IBM Quantum

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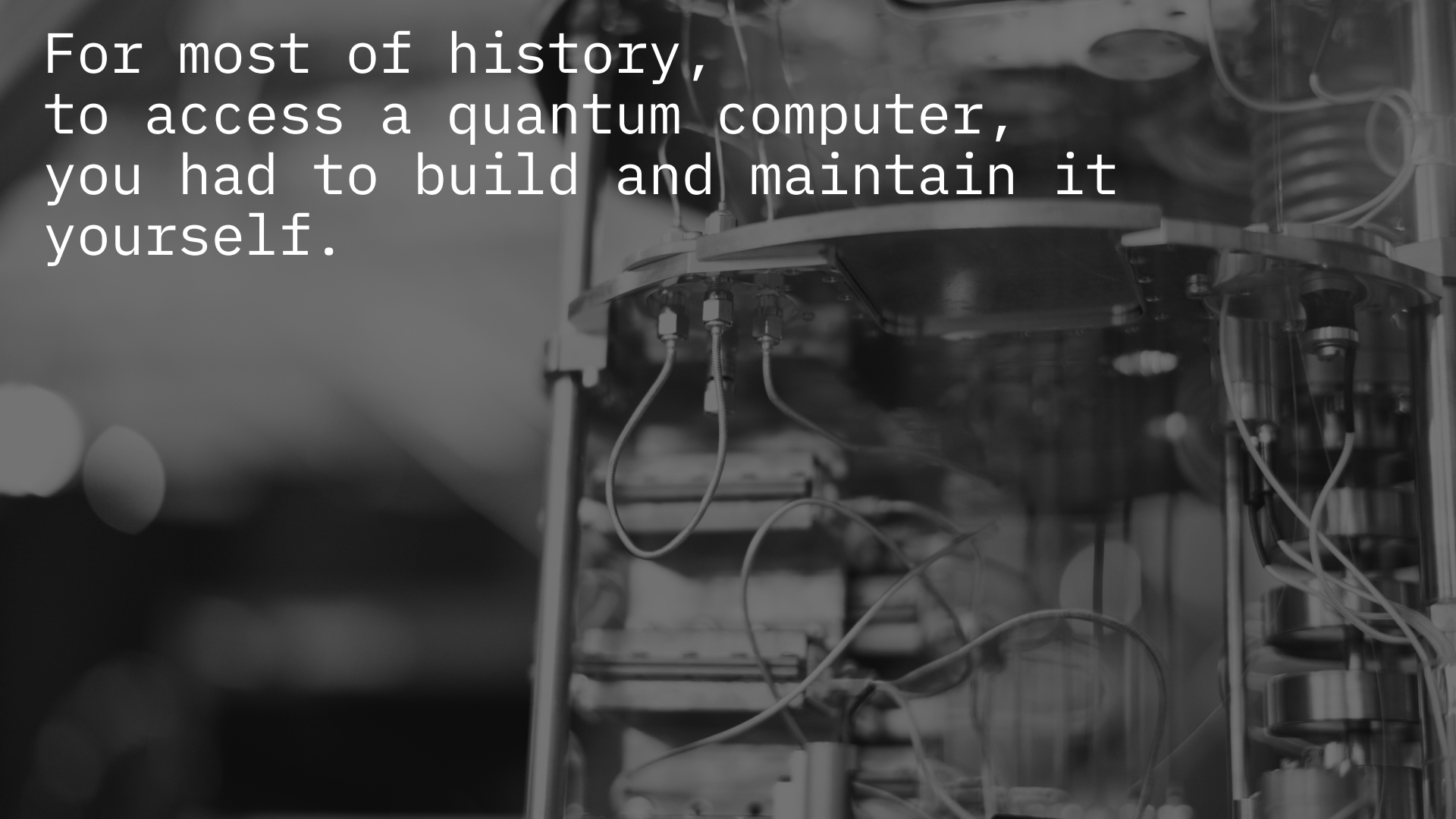


For most of history,
to access a quantum computer,
you had to build and maintain it
yourself.

Five years ago, that changed.

IBM

May 3, 2016
Posted in: Quantum Computing

Quantum computing: It's time to build a quantum community

WIRED

CADE METZ BUSINESS 05.04.16 12:01 AM

IBM IS NOW LETTING ANYONE PLAY WITH ITS QUANTUM COMPUTER

The New York Times

IBM Wants Everyone to Try a Quantum Computer

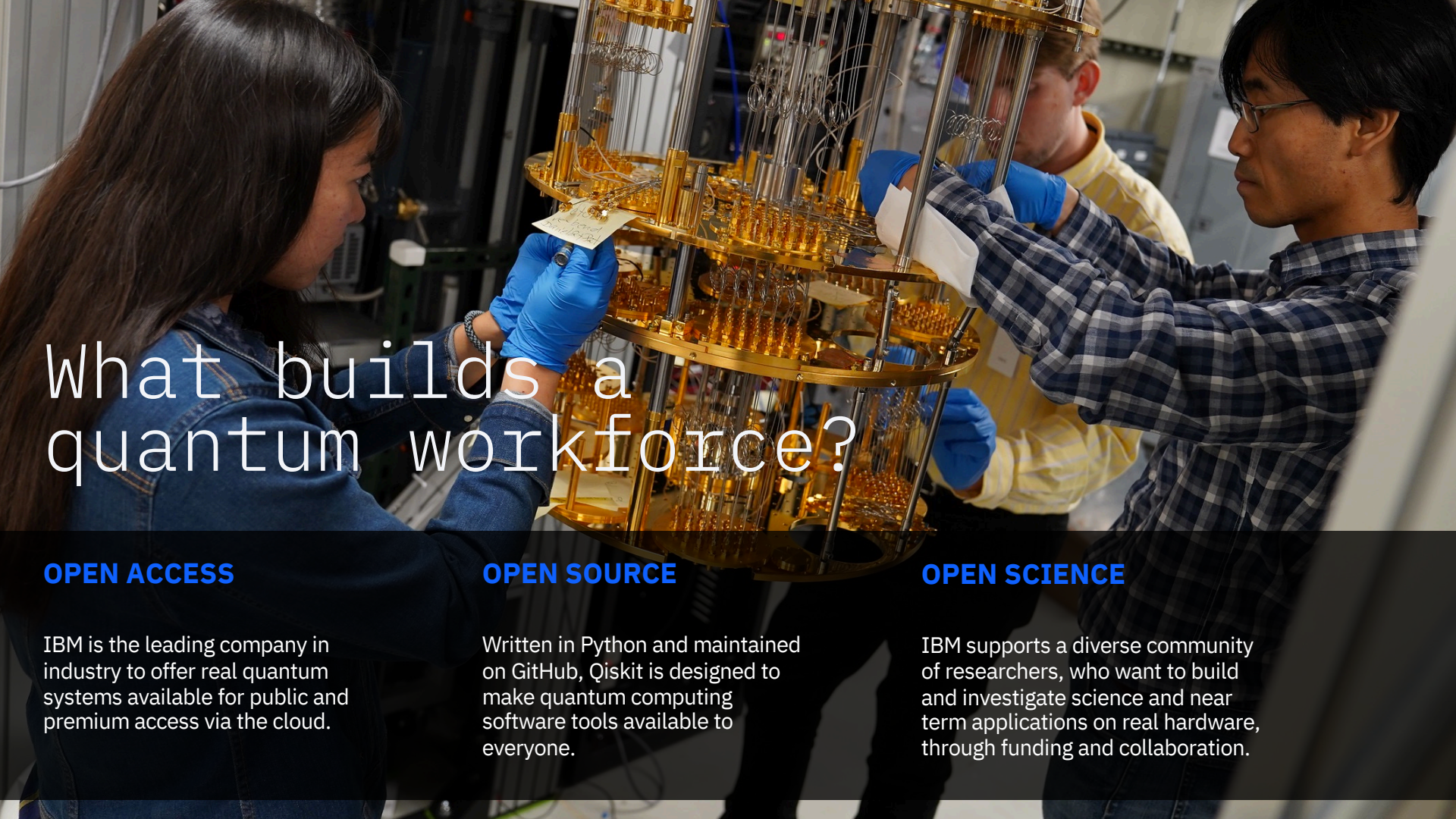
By John Markoff

May 4, 2016

TechCrunch

IBM launches quantum computing as a cloud service

Ron Miller @ron_miller / May 4, 2016



What builds a quantum workforce?

OPEN ACCESS

IBM is the leading company in industry to offer real quantum systems available for public and premium access via the cloud.

OPEN SOURCE

Written in Python and maintained on GitHub, Qiskit is designed to make quantum computing software tools available to everyone.

OPEN SCIENCE

IBM supports a diverse community of researchers, who want to build and investigate science and near term applications on real hardware, through funding and collaboration.

Your future starts with an IBM Quantum internship

IBM has created the **largest quantum computing training program in the world**. Our internship program has grown to providing over **100 paid internship opportunities** distributed globally where we recruit the best diverse talent entering the field.

Areas of study:
Computer science
Physics
Math
Chemistry

Desired skills:
Research, engineering,
Software development,

IBM Quantum Interns

An IBM Quantum internship will connect you with other students, university programs, IBM Quantum Network organizations, and the quantum computing community. Gain valuable skills and experience essential for future professional opportunities and continued studies. Contribute to the open source Qiskit project, conduct fundamental research into quantum computing, and help people understand the relevance of quantum computing.

We are looking for candidates with exposure to quantum computing fundamentals through formal

See IBM Quantum internships

ibm.co/quantuminternships

Career Roles in Quantum Computing at IBM

IBM **Quantum**

STUDY

Physics

Math

Chemistry

Computer Science

Electrical Engineering

Computer Engineering

Mechanical Engineering

RESEARCH

Quantum computing theory

- Error correction
- Quantum algorithms
- Quantum device and quantum operations physics

Quantum applications

Quantum hardware and device design, including automated Hamiltonian extraction from geometry

Optimal control theory and experiment

Quantum verification, validation, benchmarking

Multi-qubit gates optimization

Quantum transduction

Materials science and engineering

Decoherence mechanisms

Low-noise cryogenic amplifiers

Experimental physics (low noise/cryogenic/RF/qubit) measurements

Simulation of quantum systems/physical systems

SOFTWARE

Architecture, systems software, and firmware engineering

Scientific programming

Programming languages such as Python, C++, and their bindings (Cython, pybind11, etc)

Graph algorithms and data-structures

Compiler design

Program language design

Qiskit

DevOps, Security, Cloud Services & APIs

User experience design

Quantum applications research

HARDWARE

Quantum engineering

Micro fabrication (especially thin-film deposition, lithography, and Josephson junction growth)

Packaging (bump bonding, fanout/interposers, light-tight enclosures)

Microelectronics process development and integration

Microwave circuit engineering

Mechanical engineering / Thermal engineering

Quantum control and classical electronics

Real-time systems, including DSP and FPGAs

RF and μW radio transceivers

Low-power cryoelectronics, e.g. CryoCMOS and SFQ

Circuit design

Chip design and layout

Microwave Modeling

How to stay connected with our community?

IBM **Quantum**

Explore Qiskit.org

The single best landing spot for new and existing members of the Quantum Community. Get started here to learn more about all things Qiskit.

Be Part of the Github Community

Learn how to write your first quantum program - by having fun! Check out the repo of community-contributed Jupyter notebooks that leverage the features of Qiskit

Join the Qiskit Slack Community

Join the Qiskit Slack Community to connect with Advocates, IBMers, and other members of the community to ask questions and find the answers you are looking for (making connections along the way)!

Subscribe to Qiskit YouTube

For high-quality and fun videos that are accurate, practical, and engaging. Get started with the Coding with Qiskit series.

Learn Quantum with the Qiskit Textbook

The textbook is not only a coursework supplement: it's a comprehensive and interactive self-learner's resource for programming quantum computers using Qiskit!

Compete in Qiskit Camps & Challenges

From virtual Quantum Challenges, university hackathons, to full-scale Qiskit Camps - join a loacl event to put your Qiskit skills to the test and connect in person with fellow Qiskitters, as well as IBM Quantum Researchers.

Organize Community Events

With support from the IBM Quantum team, plan and host hackathons, meetups, or other events at your local university or community!

Apply to be an IBM Quantum Intern

Experience contributing to Qiskit, fundamental research in quantum computing, and promoting the relevance of quantum computing while gaining valuable skills and essential experience.

Become a Qiskit Advocate

Be a community leader focused in growing and developing open-source and Quantum communities, research, and development.