

QUANTUM INDUSTRY COALITION

May 18, 2021

The Honorable Eddie Bernice Johnson
Chairwoman
House Science, Space and Technology
Committee

The Honorable Frank Lucas
Ranking Member
House Science, Space and Technology
Committee

The Honorable Jamaal Bowman
Chairman
Energy Subcommittee
House Science, Space and Technology
Committee

The Honorable Randy Weber
Ranking Member
Energy Subcommittee
House Science, Space and Technology
Committee

Dear Chairwoman Johnson, Ranking Member Lucas, Chairman Bowman and Ranking Member Weber:

I am writing to you on behalf of the Quantum Industry Coalition regarding this week's hearing on "Accelerating Discovery: the Future of Scientific Computing at the Department of Energy." The Quantum Industry Coalition is a group of companies dedicated to US leadership in the quantum fields. Its members include Accenture, AgilePQ, Amazon Web Services, Anametric, ColdQuanta, D-Wave Government Inc., EeroQ, Entanglement Institute, Founders Fund, Google, Honeywell, IBM, MagiQ Technologies, Nanotronics, Quantum Xchange, Qubitekk, Rigetti Computing, Safe Quantum, Inc., Seeqc, Strangeworks, Xofia, and Zapata Computing.

The Department of Energy (DOE) has been a leader in high-performance computing for decades. In the last few years, thanks in large part to research conducted through DOE, other federal agencies, academia, and the private sector, quantum computing has begun to emerge as a valuable aspect of high-performance computing. While quantum computing will not supplant classical computing, it will provide critically important new capabilities that will make it possible to solve computing problems that classical computers could not solve for the foreseeable future. The combination of quantum computing with classical computing, also called hybrid, will help drive the next generation of advances and breakthroughs across a broad spectrum of scientific and technological fields. Today, nearly all quantum computing hardware is now made available securely via the cloud, which provides the added benefit of breaking down any barriers to access the power of quantum computing. The technology is now at the point when accelerated innovation can occur.

The scientific, economic, and national security benefits of leadership in quantum information science have the potential to be extraordinary, which is why so many nations are making major quantum investments. China in particular is investing billions of dollars in quantum R&D, quantum infrastructure, and quantum workforce development because it sees quantum technologies as opportunities to leapfrog the U.S. economically and militarily.

In 2018, the House Science, Space, and Technology Committee helped lead a bipartisan, bicameral effort to improve our quantum standing by passing the National Quantum Initiative Act. It was an excellent start, and the Quantum Industry Coalition strongly supported it. But still the U.S. Government is not investing as much in quantum R&D as China is. The early lead we enjoyed is shrinking, and has disappeared in certain areas of quantum technology.

This should be alarming. Fortunately, answering our competitors' spending with more money of our own is not the only solution. The federal research enterprise - including the National Labs, NSF, NIST, and federally-supported research at universities, FFRDCs, and elsewhere - works best when it can leverage the full power of U.S. companies.

The level of quantum innovation taking place at U.S. companies today is unmatched anywhere in the world. From emerging companies to global powerhouses, the private sector is developing the quantum hardware, software, and applications that will help secure U.S. leadership.

The key question is how the federal government can maximize the value of the U.S. private sector's contribution. We offer a few thoughts, focused on the role of the Department of Energy and the National Laboratories:

- **Encourage translational research with near-term applications.** Too often, federal research priorities are limited to fundamental, basic research - excluding applied research that leads to near-term applications. This was a weak point of the otherwise largely successful National Nanotechnology Initiative; basic research conducted in the United States was often commercialized overseas, to our competitors' benefit. It is a challenge we see across federal research. Near-term applications should be a priority, and separate funding should be made available for applications with a development timeline of one, two, and three years.
- **Host user facilities with a variety of hardware, software, and applications.** DOE and the country would benefit greatly from a network of user facilities with a wide variety of commercially viable quantum computers and related hardware, available via cloud access, and supporting a wide variety of commercially viable software and applications. These facilities would help reduce the cost of access to quantum computing capabilities. They would also become hubs that would begin generating research and economic value based on the size and quality of the user group. The user facilities should be public-private partnerships involving small and large companies.
- **Provide on-ramps for small and medium-sized businesses.** Beyond the SBIR and STTR programs, DOE should look for ways to make it easier for small and medium-sized businesses to participate. This includes funding opportunities, but also being a good customer: operating at the speed of small business; avoiding unnecessary contracting complexity; and being willing to work with companies of all sizes.
- **Promote quantum workforce development.** A highly-qualified, large, and diverse domestic quantum workforce is key to long-term quantum leadership. Throughout its activities, DOE should seek to expand the domestic quantum workforce. This begins with education, including support for quantum-track instruction and research opportunities at the high school, secondary, and post-secondary levels. It also includes providing access to quantum computing capabilities for a diverse and growing group of students, researchers, and professionals, along with public-private partnerships to provide opportunities to enter the quantum fields.

Thank you for your continued leadership on these important matters. We would be happy to answer any questions you may have.

Sincerely,

Paul Stimers
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Quantum Industry Coalition
www.quantumindustrycoalition.com