



SUMMARY OF 2018 WHITE HOUSE SUMMIT ON ADVANCING AMERICAN LEADERSHIP IN QUANTUM INFORMATION SCIENCE

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Background

We are on the cusp of a revolution in which quantum information science (QIS) will change the way Americans live, work, and understand the world. QIS can transform industries, create jobs, and yield great benefits for the American people.

The United States is the world leader in QIS, but competition is growing. In order to maintain and expand leadership in this space, all stakeholders—academia, industry, and government—must work collaboratively to continue efficiently and effectively making advances.

On September 24, 2018, The White House convened over 100 senior government officials, Nobel Laureates, technical experts, international luminaries, university leadership, American business leaders, and renowned academics and researchers who are prioritizing QIS in their own departments, agencies, laboratories, and companies.

“For the first time, The White House has gathered representatives from 13 federal agencies along with some of the greatest innovators in QIS...We convened everyone here at The White House because we recognize government cannot do this alone. With your expertise and leadership, we can focus on this field long-term and realize the amazing potential of quantum science and technology,” said Deputy Assistant to the President for Technology Policy Michael Kratsios.

Summit attendees participated in two sets of breakout sessions focused on taking a science-first approach to QIS development, creating a quantum-smart workforce, and engaging with the innovative ecosystem surrounding QIS.

Industry attendees represented a diverse selection of startups and established companies that stand poised to lead the way to America’s quantum revolution, including in fields such as quantum computing, defense and homeland security.

The summit was kicked off by Mr. Kratsios, National Science Foundation (NSF) Director France Córdova, National Institute for Standards and Technology (NIST) Director Walt Copan, Department of Energy Under Secretary for Science Paul Dabbar, and Department of Defense Under Secretary of Defense for Research and Engineering Mike Griffin.

Other Federal participants included representatives from The White House National Security Council, National Economic Council, as well as representatives from the Defense Advanced Research Projects Agency (DARPA), Intelligence Advanced Research Projects Activity (IARPA), NSF, NIST, and Departments of Defense, Energy, Interior, Agriculture, and Homeland Security, many of whom sit on the National Science and Technology Council’s (NSTC) subcommittee on QIS. Federal participants had the opportunity to engage in robust discussions with academic and industry leaders about the innovations they are spearheading.

Key Takeaways

The breakout session discussions focused on:

- **Developing a National, science-first quantum strategy to ensure American leadership.** Participants noted a strong benefit to defining generational scientific milestones – Grand Challenges – and to ensure funding for the intermediate steps to encourage and maintain stakeholder investments. Integration of scientific and technical needs across boundaries – from physicists and materials scientists to engineers and computer scientists – should occur at the beginning of the research process. The Federal government can work to bring diverse stakeholders together, and can help sustain research towards such Grand Challenges. Research infrastructure, including national laboratories and industrial facilities, but also key trained support staff, will play a crucial role in enabling the next generation of science as quantum device complexity increases.
- **Supporting workforce development to promote quantum-smart workers.** Breakout discussions indicated that development of a quantum-specific degree within undergraduate curriculum at universities and colleges will be a crucial aspect of moving forward. Much of the future quantum workforce will be engineers and operators of the devices; a wide range of educational way points, from certificates to majors to professional masters, would complement the PhD track that currently exists. In addition, the Federal government could support educational opportunities at earlier stages, including high school, while also maintaining an open approach to research to enable the best and the brightest from around the world to contribute. A broad spectrum of potential contributors will also help to improve access for a more diverse workforce in this technical area.
- **Engaging with the diverse and capable innovative ecosystem surrounding QIS.** A broad consortium of industry, academia, government, and international partners can help resolve issues from intellectual property to technology forecasting to pre-competitive research and development. Industrial engagement with internship and externship programs, along with making available a network of quantum services that researchers can use will contribute significantly to ensuring that innovative workers can realize their potential.

Agency Announcements

National Science Foundation Director France Córdoba and Department of Energy Under Secretary for Science Paul Dabbar made announcements regarding their respective departments and agencies:

- National Science Foundation Director France Córdoba [announced](#) a \$31 million award for fundamental quantum research.
- Department of Energy Undersecretary for Science Paul Dabbar [announced](#) \$218 million in funding for 85 research awards in the emerging field of QIS.
- National Institute for Standards and Technology Director Walt Copan [announced](#) a cooperative research and development agreement with SRI International to lead a consortium focused on quantum science and engineering.

Next Steps and Conclusion

The National Strategic Overview for QIS identifies the tools and options necessary to expand American leadership in quantum information science. The Trump Administration recognizes the importance of this scientific field and the technology it will enable, and has taken steps to prioritize QIS for the Nation's benefit. The White House repeatedly designated QIS as an Administration research and development (R&D) budget priority, and The White House Office of Science and Technology Policy (OSTP) appointed its first-ever assistant director to lead its QIS portfolio. In June 2018, the NSTC chartered a Subcommittee on QIS, which coordinates R&D efforts across the Federal government. This Subcommittee just released its [National Strategic Overview](#) for QIS, which lays out the key policy recommendations to enable the expansion of American leadership in the field.

As the Trump Administration continues to support innovations in QIS, OSTP looks forward to collaborating with its agency partners, industry, and academia to ensure American leadership in this critical field.