

# National Quantum Initiative Reauthorization Act

## Executive Summary

### Background

The National Quantum Initiative Act (NQIA) was signed into law by President Trump on December 21, 2018 “to accelerate quantum research and development for the economic and national security of the United States.” The NQIA authorized the National Institute of Standards and Technology (NIST), the National Science Foundation (NSF) and the Department of Energy (DOE) to strengthen quantum information science programs, centers, and consortia. The NQIA also called for a coordinated approach to quantum research and development efforts across the United States government, including the civilian, defense, and intelligence sectors by establishing the National Quantum Coordination Office within the White House Office of Science and Technology Policy .

Quantum technologies will be transformative across the scientific, economic, and defense realms. For that reason, there is a global race among great powers to develop operational quantum platforms across a variety of applications. The United States has retained its lead in the theoretical physics that underpins quantum computing and related technologies, but adversarial nations like China have taken the lead in developing some quantum communications applications and are rapidly closing the gap in other areas.

Reauthorizing and updating NQIA’s quantum programs is critical to ensuring that the United States’ policies reflect the advances made in quantum information science, engineering, and technology since the passage of the original Act. A reauthorization is also necessary to ensure the quantum industry and ecosystem has access to a robust, educated workforce and the U.S. is partnering with allied nations to bolster quantum research and development to counter quantum advancements by our competitors.

### Summary of Legislation

**Modernizes Quantum Research and Development Programs and Increases Government Coordination:** The bill modifies the goals and objectives of many quantum programs across agencies to ensure quantum research can move beyond basic science and into applied research, demonstration, and commercialization. It also strengthens requirements for public-private partnerships between research agencies and the quantum industry.

**Authorizes the Creation of New Quantum Centers and Institutes:** The bill authorizes the creation of new quantum research centers and institutes at NIST, NSF, and NASA and bolsters support for the DOE centers. This includes a new workforce coordination hub to build new and strengthen existing workforce pathways between universities, technical schools, and other institutions and the quantum industry.

**Formally Adds NASA to the Quantum Program:** The bill formally adds NASA as a quantum research agency under the NQIA, bringing its unique capabilities, perspectives, and testing capacity into the quantum ecosystem.

**Strengthens International Research and Development Activities with Allies of the United States:** The bill addresses competition from China by requiring the President to develop a strategy to establish new international partnerships with allies of the United States. China has invested more in quantum research and development than the rest of the world combined over the last ten years and has identified quantum science as a key strategic field to dominate.

**Authorizes Activities to Support the Quantum Industry:** The bill authorizes the creation of Quantum Testbeds to support translational research for near-term and medium-term use cases and provide research and testing resources to support the development of new quantum capabilities across the private sector. It also authorizes the creation of a new Quantum Instrumentation and Foundry Program to develop domestic supply chains and provide resources, including devices, hardware, software, and materials, for the use of the quantum industry and research community.

**Strengthens Workforce and STEM Development Programs:** The bill authorizes NSF to extend new traineeships, fellowships, scholarships, and other workforce-supporting programs to a broader population of STEM students with the potential to enter the quantum field.