Quantum Information Science and the Technology Frontier

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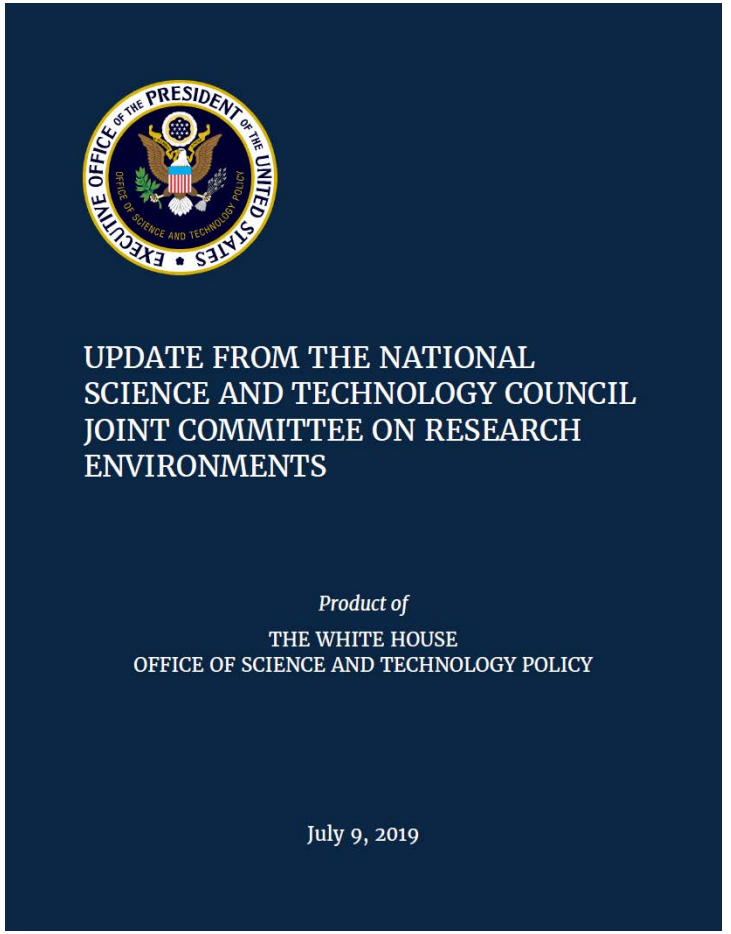
Building the research environment for transformative quantum science

- **The quantum workforce?** Need more people, from a broader set of backgrounds; requires a safe and inclusive work environment.
- **Science-first approach?** Need to maintain an open, rigorous approach to the research.
- **Connecting science to society?** Must continue to balance innovation and disruption, from industry to security to citizens.
- **Efficient and effective?** Leverage existing approaches, minimize administrative burden, nurture a culture of discovery, and enable responsible risk-taking.



Quantum industry and the frontier

- **Current quantum technology:**
  - Atomic clocks; modern telecom
  - Nuclear magnetic resonance; LIGO
- **Next generation quantum?**
  - Improved computational approach to materials, chemistry
  - Fundamental advances in condensed matter, high energy theory
  - New understanding of optimization, machine learning
  - Spin-offs: Quantum random number generators, new sensing modalities, better PNT, new qubit technologies, new analog microwave and optical technologies
- **The 10 year outlook?**
  - The beginnings of a sea change for corporations and government – the need to incorporate quantum computing and technologies into their business model
  - Unimagined applications are around the corner, but only if we explore!