Highlights of Canada’s Move to Quantum Readiness

Bridget Walshe
Canadian Quantum Research

- Canada is home to several leading quantum technology research centres
- $1 billion invested in research and development
- Canada First Research Excellence Fund:
  - UBC
  - University of Waterloo
  - Université de Sherbrooke
Canadian Quantum Research

- Quantum Security Technology Access Centre (Q-STAC)
  - Research and Technology Foresight & Road Mapping
  - Quantum Education
  - Collaborative Research

- Open QKD Network
  - Maintained by researchers from IQC, University of Waterloo
  - Software from the Q-STAC QKD project
  - ETSI ISG-QKD is standardizing the API
  - GitHub: Open-QKD-Network/qkd-net
Canadian Quantum Research

- **Open Quantum Safe**
  - Support the development and prototyping of quantum-resistant cryptography
  - Prototype integration into protocols and applications, including OpenSSL and OpenSSH
  - Support future transition to quantum resistant cryptography

- **Quantum Encryption and Science Satellite (QEYSSat)**
  - Led by The Canadian Space Agency
  - Distribute quantum encryption keys between a ground station and a satellite
  - Scheduled launch and mission in 2022/2023
Canadian Transition to Quantum Safe

- **Quantum Safe Canada**
  - Not-for-profit dedicated to ensuring Canada will be safe and prosperous as powerful quantum computers become available
  - Identify important issues to enable quick transition

- **Quantum Industry Canada**
  - Industry group recently formed by members of the quantum technology sector in Canada
  - Support the growth of a vibrant commercial quantum technology ecosystem in Canada
  - Leverage the Canadian research base
  - Enabling an environment that fosters success
  - Addressing the impacts of quantum technologies, including quantum readiness
National Quantum Strategy

Enhance Canada’s ability to conduct leading-edge science and mobilize the results of this work through a dynamic quantum technology-based private sector in Canada.

- Under development by National Research Council Canada
- Informed by a group of Canadian University and Industry representatives

Key components to date include:
- University-based research and education
- Skills and talent development
- Engagement of the commercial sector
- Federal government research/procurement/operations
- The international arena and quantum standards systems
The Canadian Centre for Cyber Security

- Flagship cyber security authority for Canada, created by the National Cyber Security Strategy to demonstrate Federal leadership and bring clarity to stakeholders across Canada
- Unites cyber security expertise across the Government of Canada into a single window for stakeholders
Canadian Centre for Cyber Security
Promoting Quantum-Safety

- Protecting our most sensitive information today
  - Focusing on long-lifespan, sensitive information
  - Working with information owners to understand the impact to their information
  - Providing guidance on how to protect against the quantum threat today

- Developing a long-term strategy for the future
  - Partnering with Academia, Industry and Standards organizations
  - Advancing quantum-safe research, solutions, and technologies
  - Promoting awareness and planning and cryptographic agility
  - Leading the development of a Canadian cryptographic community-backed strategy for a secure online Canada
The Canadian Centre for Cyber Security

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