# NTU Q

## **SELECTED NEWS**

#### How IBM Quantum is bringing organizations along their quantum-safe technology journey

egulatory	2022	2023	2024	2025	2026+
ilestones	Is NIST selects algorithms for standardization	4 Federal agencies plan for adoption of	PQC 4 NIST publishes PCC standards	4 CNSA 2.0: preference to PQC-compliant vendors	4 Vendors complete transition to PQC
IBM services		Helping clients throughout their journey to quantum safe			
		Scale toward crypto-agility           IBM multicloud services, cybersecurity transformation services           Modernize applications and data security           IBM application modernization, data modernization services			
		Establish foundation IBM Quantum Sale technical service	es		
BM Quantum Safe	Empowering clients to discover, obser	ve, and transform their cryptograph			
technology			IBM Quantum Safe Remedi	inter	
			aber Quantum sure Remea	ator	
		<ul> <li>Remediation patterns: Proxy, VPN,</li> </ul>			
		IBM Quantum Safe Advisor	TLS 🙁 Quantum-safe PKE,		
		IBM Quantum Safe Advisor Compliance posture, OV vulnerabilities, prioritration IBM Quantum Safe Explorer	TLS ② Quantum-safe FKI, key and certificate manag		
	Algorithms & protocols ■ Keysurasystom - CRNSTALS-Kyter ■ Dage sequence - CRNSTALS-Kyter	IBM Quantum Safe Advisor       Compliance assture, valenshill ex, priori dation       IBM Quantum Safe Explorer       Scarred, deprodency analyzer, CBOM generator       Intervention	TLS (2) Querchameante Erd, key and cest filoate manage MS Integration (NS) Integration operability standards Libraries		
IBM infrastructure	Key encryption – CRYSTALS-Kyber	TBM Quantum Safe Adviser     Compliance posture,     viberabilities, providuation     UBM Quantum Safe Explorer     Sour res dependency     analyzar, CBOM generator     Tore     Accon	TLS (2) Querchameante Erd, key and cest filoate manage MS Integration (NS) Integration operability standards Libraries		

**P**ractical quantum computing solutions could impact computing strategies across industries by the decade's end. But it will also profoundly alter how we secure our digital data fabric through cryptography. Organizations are already examining how to upgrade their cybersecurity to prepare for this new computational era.

IBM has announced its quantum-safe roadmap to equip industries with cybersecurity capabilities for the quantum computing era. They have introduced IBM Quantum Safe technology, which includes tools, capabilities, and approaches to ensure organizations' transition to quantum safety. The roadmap comprises three stages: Discover, Observe, and Transform. To aid these stages, IBM has developed three technologies: Quantum-Safe Explorer for discovering cryptographic usage, Quantum-Safe Advisor for observing cryptographic compliance and vulnerabilities, and Quantum-Safe Remediator for transitioning systems to quantum safety. The roadmap aligns with the imminent introduction of postquantum cryptographic standards by NIST and the NSA's mandate for quantum-safe algorithms in national security systems by 2025.

#### <u>Noise-canceling qubits can minimize errors in</u> <u>quantum computers</u>



Despite their immense promise to solve new kinds of problems, today's quantum computers are inherently prone to error. A small perturbation in their surrounding environment— a change in temperature, pressure, or magnetic field, for instance —can disrupt their fragile computational building blocks, called qubits.

Researchers at the University of Chicago's Pritzker School of Molecular Engineering have developed a novel method to minimize errors in quantum systems by continuously monitoring environmental noise. The method involves using spectator qubits, which are embedded in the quantum computer for the sole purpose of measuring external noise. This information is then used to adjust data-processing qubits, reducing noise and error. Likened to noise-canceling headphones, this system has shown promising initial results in a neutral atom quantum array, though more work is needed to improve its sensitivity. This innovative approach could eventually be implemented in the background of any quantum computer to minimize errors during data storage and computation.

## SELECTED EVENTS

### **Qiskit Hackathon Taiwan 2023 is coming**

This activity is open to all who interest in quantum computing! Registration will end on Jun 25th.

#### Qiskit Global Summer School 2023:Theory To Implementation

