

Welcome to this month's roundup of exciting developments in the quantum computing world!

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### New finds this week

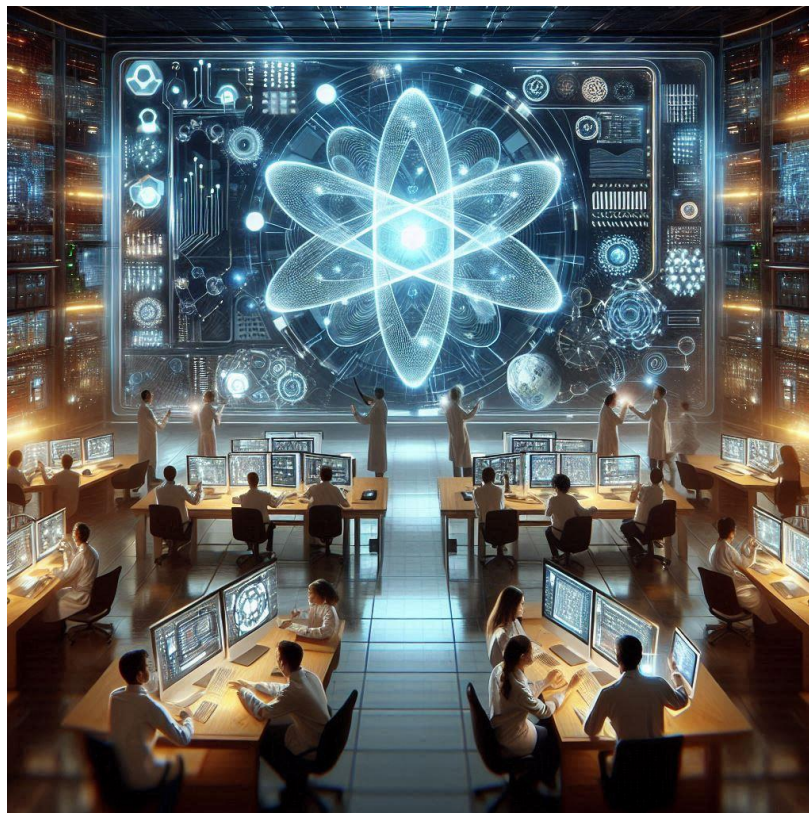
World Quantum Day

### IBM's 4,158-Qubit System

Combining Quantum and Classical Computing

### Being Qday Ready

Preparing for the Quantum Computing Era

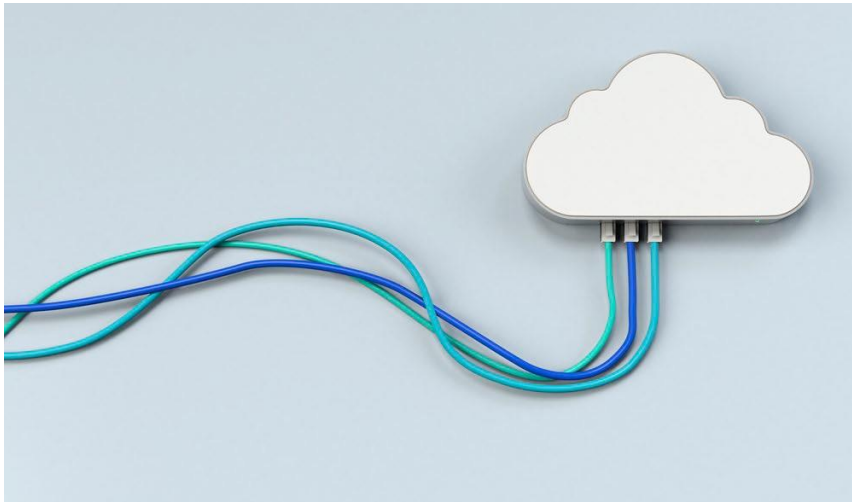


## World Quantum Day!

The UN is celebrating 2025 as the International Year of Quantum Science and Technology to recognize the significant advancements in quantum science and its potential to revolutionize various fields. April 14th is particularly significant as World Quantum Day, which is celebrated to honor the contribution of quantum theory and the importance of Planck's constant.

**In celebration of World Quantum Day on April 14, 2025, marking a century of groundbreaking quantum research, we are thrilled to introduce our new website: qdayready.com. This platform is dedicated to raising awareness about quantum computing and its far-reaching implications. We warmly invite you to explore the website and subscribe to our monthly newsletters to stay updated and informed.**

This is our first monthly newsletter that is designed to keep you updated about the latest advancements in the field of Quantum Computing and related technologies. Q-Day is **the day that a quantum computer will be able to crack our public encryption systems, hence the need to be aware and Qday Ready....more on Pg 3.**



## Quantum Supremacy Milestone

D-Wave recently demonstrated a groundbreaking achievement in quantum computing by solving a complex material simulation problem in just 20 minutes using their Advantage2 annealing quantum computer. This simulation involved programmable spin glasses, which are computationally challenging magnetic material problems with real-world applications in materials discovery.

In comparison, solving the same problem on one of the world's most powerful classical supercomputers, equipped with GPU clusters, would take nearly a million years and consume more energy than the world's annual electricity usage. This milestone is considered a significant demonstration of quantum computational supremacy on a practical, real-world problem, showcasing the potential of quantum annealing for solving problems beyond the reach of classical systems.

## Distributed Entanglement Breakthrough

Photonic achieved a milestone by demonstrating distributed entanglement, linking qubits across separate quantum computers. This advancement paves the way for scalable quantum networks.

## IBM's 4,158-Qubit System

**IBM unveiled a quantum system combining quantum and classical computing, designed to tackle complex problems in industries like finance and telecommunications.**

IBM's hybrid computing model seamlessly combines quantum and classical computing capabilities by linking its Quantum Processing Unit (QPU) with a network of classical computers. This integrated setup facilitates crucial functions such as calibration, storage of results, error mitigation, and future error correction, harnessing the complementary strengths of both quantum and classical systems to tackle intricate computational challenges.

## Breakthrough in Chip Fabrication

Researchers at University College London achieved near-perfect atom placement using arsenic in silicon, marking a major leap toward scalable, low-error quantum computing systems.

## Topological Qubit Development

Microsoft announced the creation of a "topological qubit," which promises greater stability and reliability for ultrafast quantum computing. This innovation could revolutionize the field by tackling complex computational challenges.

**Learn more about Qday and Quantum Computing on**

**[www.qdayready.com](http://www.qdayready.com)**

# Being Qday Ready

Q-Day refers to the anticipated moment when quantum computers become powerful enough to break the encryption systems that currently secure our digital communications, financial transactions, and sensitive data. These encryption systems, such as RSA and ECC (Elliptic Curve Cryptography), rely on the difficulty of factoring large numbers or solving discrete logarithms—tasks that classical computers find nearly impossible within a reasonable timeframe. However, quantum computers, using algorithms like Shor's algorithm, could perform these tasks exponentially faster, rendering traditional encryption methods obsolete. The implications of Q-Day are profound. It could compromise the security of everything from online banking and e-commerce to government communications and critical infrastructure. This is why there is an urgent need to transition to quantum-resistant cryptographic methods, also known as post-quantum cryptography, to safeguard data against future quantum threats.



Being "Qday Ready" means preparing for this eventuality by raising awareness, adopting quantum-safe encryption standards, and ensuring that systems and networks are resilient to the challenges posed by quantum computing. It emphasizes proactive measures to protect sensitive information before Q-Day arrives, as the transition to quantum-safe systems can take years to implement effectively.

## Quantum Networking Progress

QuTech successfully connected two small quantum computers located in different cities. This marks a significant step toward practical quantum communication systems.

## Medical Device Innovation

IonQ showcased quantum computing's capabilities in medical device design, achieving a 12% improvement in processing performance. This collaboration with Ansys highlights the expanding applications of quantum technology.

## Quantum Sensing Advancements

MIT researchers introduced a new theoretical approach for generating quantum states, enhancing the accuracy and reliability of quantum sensing systems.

## Public Access to Quantum Systems

Cloud platforms like Amazon Braket, IBM Qiskit, and Azure Quantum are democratizing access to quantum computing, enabling more researchers and developers to explore its potential.

## Quantum-AI Synergy

Quantum computing is now boosting AI efficiency by up to 1,000x while using significantly less energy, as demonstrated by recent hybrid systems.