

High-Growth Technology Business Forum



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Company History

25-Year History of Innovation and Leadership



Christopher Monroe
Co-founder & Chief Scientist



Jungsang Kim
Co-founder & CTO



1995

Monroe and Wineland demonstrate first known quantum gate (NIST)

2004

Kim proposes chip-based ion trap QC architecture (Bell Labs)

2007

Monroe demonstrates first known quantum network (UMD)

2012

Kim integrates optics with ion qubits on chip (Duke)

2016

Monroe QC bests IBM on all algorithms (UMD)

2005

Monroe traps ions on a monolithic chip (Michigan)

2000

Monroe and Wineland develop modern native ion trap gate (NIST)

2011

Kim and Monroe invent photonically-networked modular quantum computer (Duke/UMD)

2013

Kim realizes >99.9% fidelity operations on stable qubits (Duke)

Rapid Evolution of IonQ

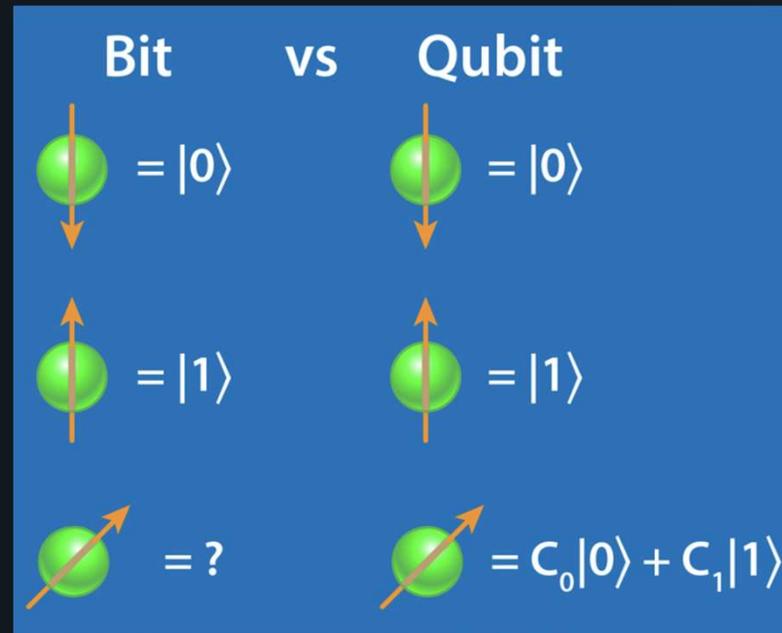






Quantum Computing

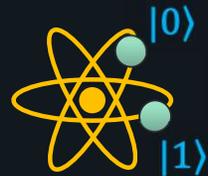
Classical Bits vs. Quantum Bits (Qubits)



Quantum Phenomena

Quantum Superposition

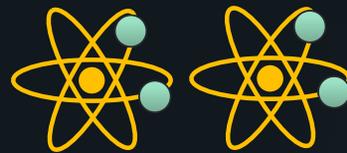
Quantum states can be added together



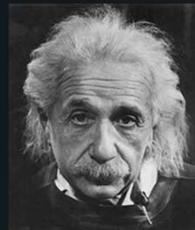
$$\text{qubit: } |\psi\rangle = a|0\rangle + b|1\rangle$$

Quantum Entanglement

Quantum state of each particle in a group is not independent even when separated by a large distance



$$\text{qubits: } |\psi\rangle = a|00\rangle + b|11\rangle$$

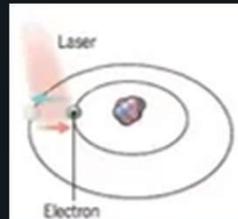


“spooky action-at-a-distance”



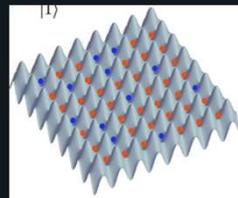
Technology

Qubit Technology - Natural Qubits



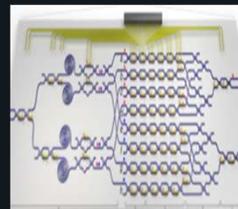
Trapped Ions

IonQ, Quantinuum, AQT,
Oxford Ionics



Neutral Atoms

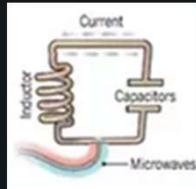
Atom Computing,
ColdQuanta, QuEra



Photonics

Psiquantum, Xanadu

Qubit Technology - Manufactured Qubits



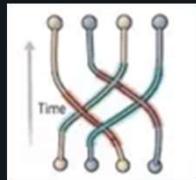
Superconducting Loops

Google, IBM, QCI, Rigetti



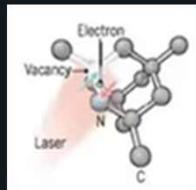
Silicon Quantum Dots

HRL, Intel, SQC



Topological Qubits

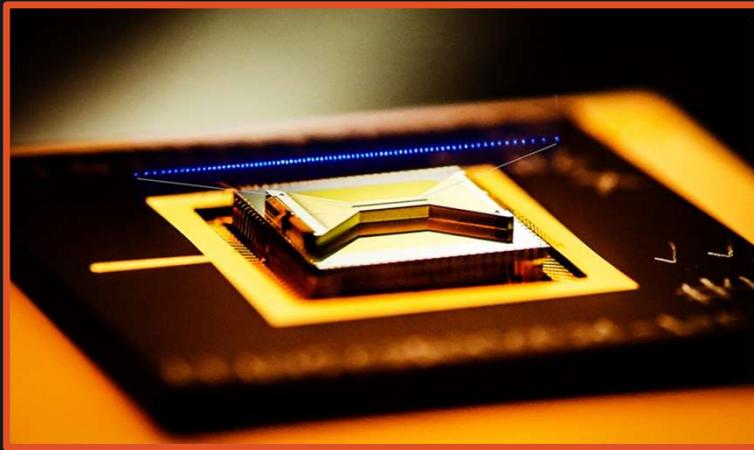
Microsoft



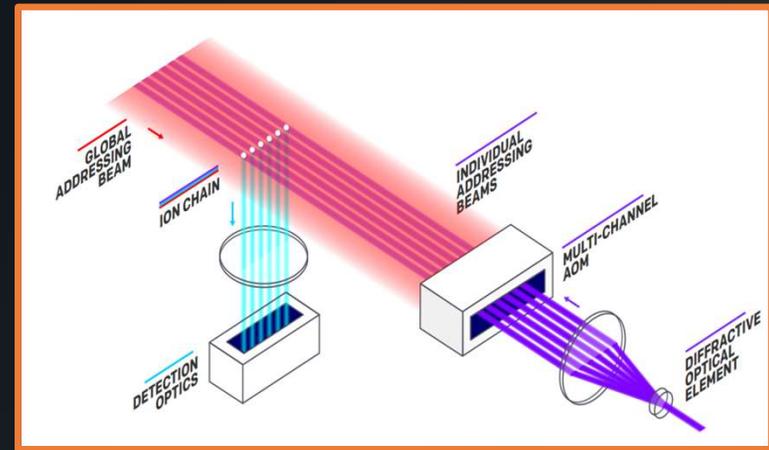
Diamond Vacancies

Quantum Diamond Technologies

IonQ Approach – Trapped Ions



Ion Trap



Quantum Module

IonQ Systems





Licensing and IP Portfolio

University Licensing



UNIVERSITY OF
MARYLAND

- **Initial IP license from universities**
Favorable terms to allow company to succeed
- **Option agreements from universities**
Ability to add to assets to IP license over time

IP Portfolio Development

International portfolio that includes more than 200 owned or licensed issued patents and pending or allowed patent applications

- Licensed growth through university option agreements
- Organic growth through internal R&D in hardware, software, system integration, and algorithms

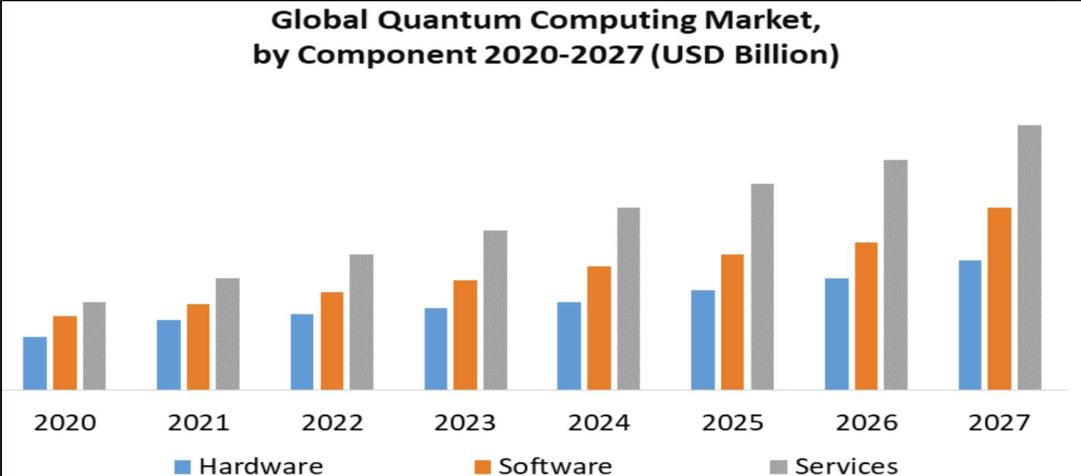
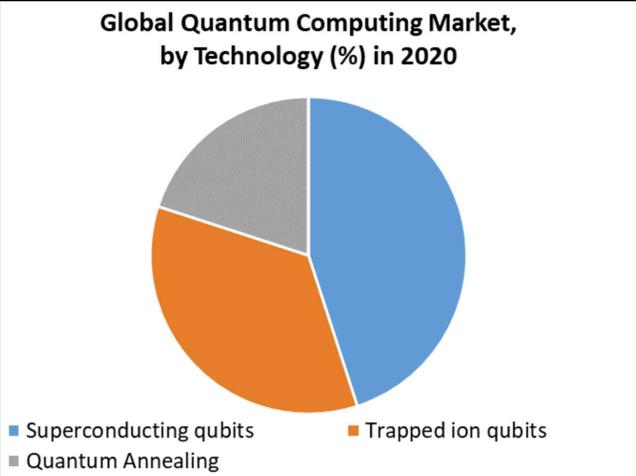


Business of Quantum Computing

Business Models

- **Quantum-as-a-Service (QaaS)**
Access to quantum computing systems through cloud providers or private services
- **Consulting Services/Software Development**
Algorithm development/solutions for different industries
- **Dedicated Systems**
Hosted or on-premise quantum computing systems

Quantum Computing Market



Maximize Market Research (MMR), Quantum Computing Market: Global Industry Analysis and Outlook, Updated November 2021.



IONQ