

# The Impact of Quantum Computing How & When

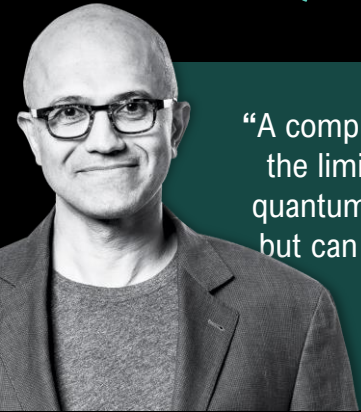


**Ilyas Khan**

Founder and Chief Product Officer

QUANTINUUM

# Quantum computing is geopolitically important



“A computer based on quantum physics could take us beyond the limitations of traditional, transistor-based computers. A quantum computer that doesn’t just go beyond Moore’s Law, but can create entirely new laws, and **would be so powerful it’s able to model nature itself.**”

**Satya Nadella - Microsoft CEO**



“**There are problems that classical computers can never solve...** We look at problems around fertilizers, food supply, new materials, financial risk. These are issues that quantum computers will be able to solve in the next three to five years. That is something which **really excites us.**”

**Arvind Krishna - IBM CEO**



“The real excitement about quantum is **that the universe fundamentally works in a quantum way**, so you will be able to understand nature better... Drug discovery is a great example.”

**Sundar Pichai - Google CEO**



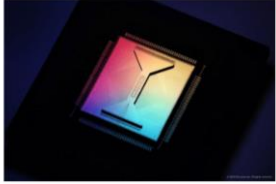
NOTE: NOT EXHAUSTIVE; TIMELINES FOR FUNDING VARY BY COUNTRY

SOURCE: “OVERVIEW OF QUANTUM INITIATIVES WORLDWIDE 2024”, QURECA, QURECA.COM/QUANTUM-INITIATIVES-WORLDWIDE


# Trusted by industry leaders today

INSIDE  
**QUANTUM TECHNOLOGY NEWS**

## Quantinuum debuts 56-qubit H2-1, touts RCS achievement with JPMorgan Chase



Quantinuum selected as a founding collaborator for NVIDIA Accelerated Quantum Research Center March 18, 2025



**Initiating impact today:**  
Combining the world's most powerful in quantum and classical compute

FORBES > INNOVATION > CLOUD

## Microsoft And Quantinuum Improve Quantum Error Rates By 800x

Paul Smith-Goodson Contributor  
Moor Insights and Strategy Contributor Group [Follow](#)

[Bookmark](#) [Share](#) [0](#)

Apr 18, 2024, 08:22pm EDT


SoftBank R&D

Press Release Computing

### SoftBank Corp. and Quantinuum Announce Collaborative Research Aimed at Integrating Quantum Computing and AI for Practical Applications

#Quantum Technology

Jan 29, 2025  
SoftBank Corp.



**“Quantum computers  
will change  
everything, even  
human biology”**

**-Steven Hawking**



# Quantum will impact every sector

Quantum computing will accelerate and enable technological breakthroughs that realise a **trillion-dollar market opportunity**

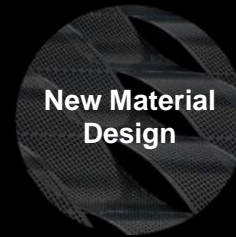
---



**Encryption Software**  
**\$20B**



**Drug Discovery**  
**\$110B**



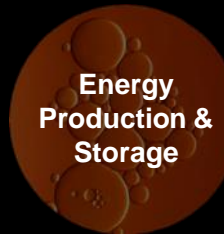
**EV / OLED Battery**  
**\$94B / \$73B**



**Risk / Portfolio Mgmt.** **\$10B**



**Carbon Capture**  
**\$4B**



**Hydrogen Storage**  
**\$18B**



**Fertilizer Market**  
**\$208B**



**Electric Vehicle Market**  
**\$18B**

# Quantinuum in summary

The leader in quantum computing



Quantinuum Investment **Partners** Timeline

420+

PhDs and Masters

Largest concentration of quantum experts outside of academia

200+

scientific papers

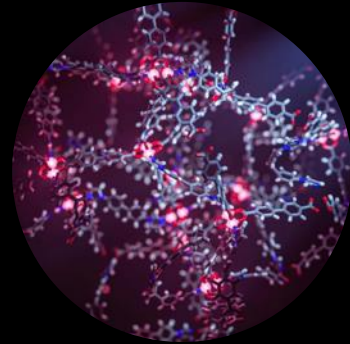
130+

global patents

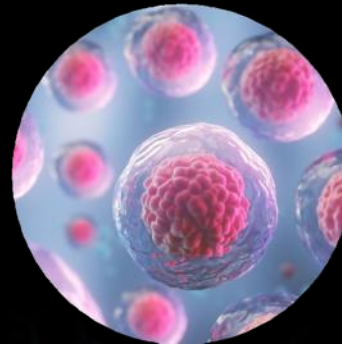
Cross-domain subject matter expertise:

- Chemistry | Materials science
- Artificial intelligence | Machine learning
- Condensed matter | Cybersecurity
- Encryption | Finance

Revolutionizing  
**Biology**



Emergence of MOFs  
in drug delivery



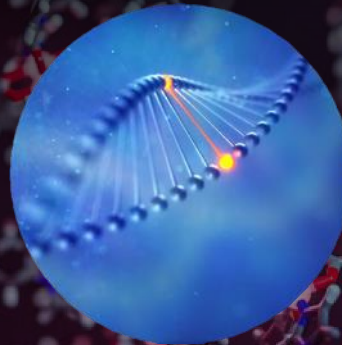
Cellular  
genetics



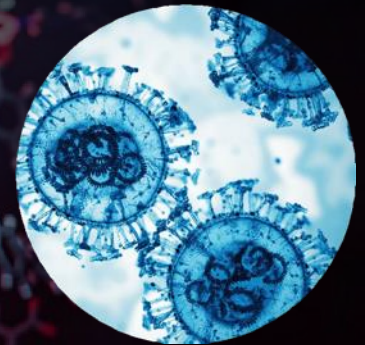
Human  
genetics



Cancer, aging, and  
somatic mutation



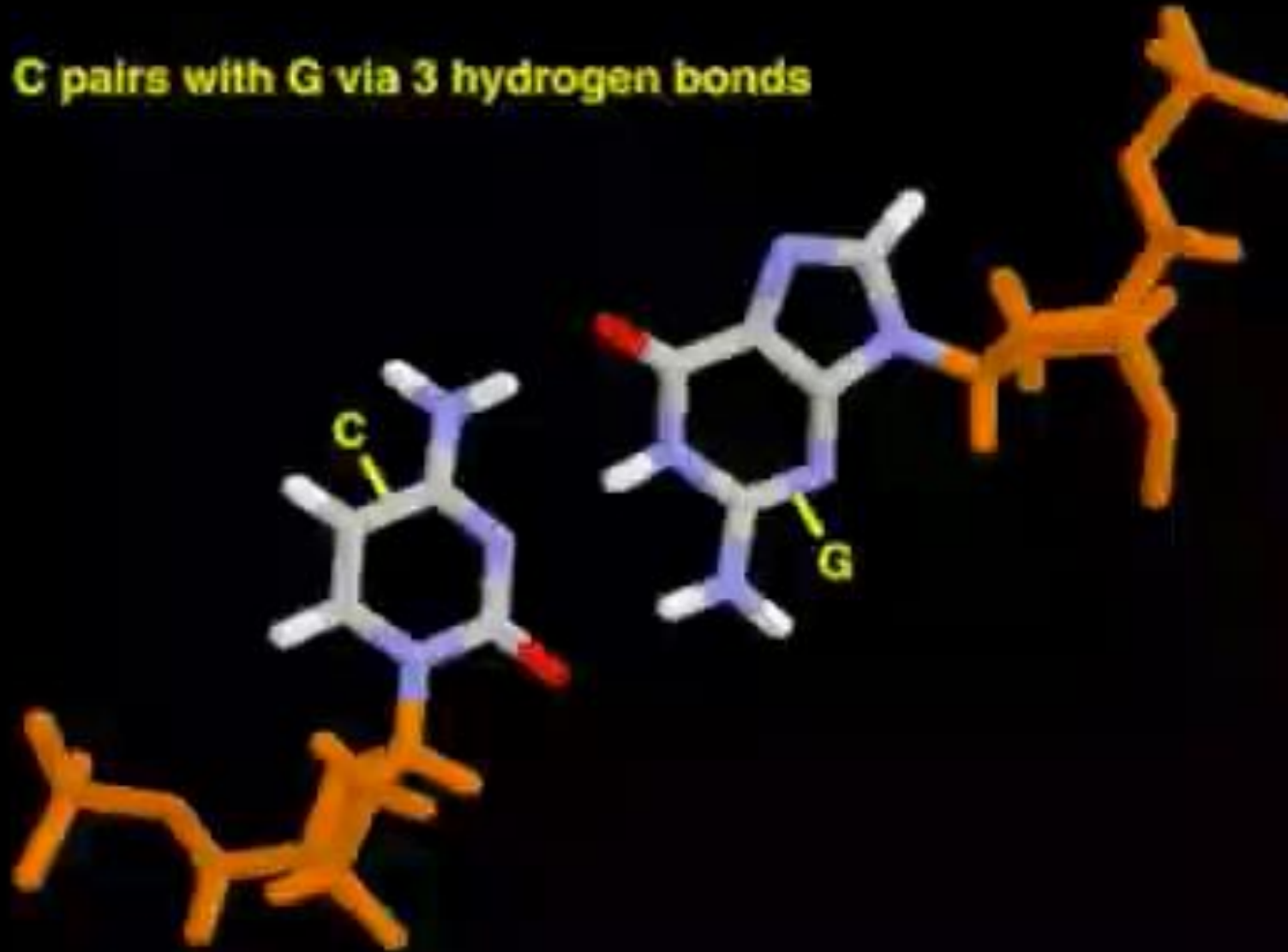
Generative  
genomics



Parasites &  
microbes

# DNA

C pairs with G via 3 hydrogen bonds



# Knot theory



## A Full Quantum Pipeline for Knot Theory

Built a complete algorithmic workflow for computing the Jones Polynomial (a key knot invariant).

### Why It Matters:

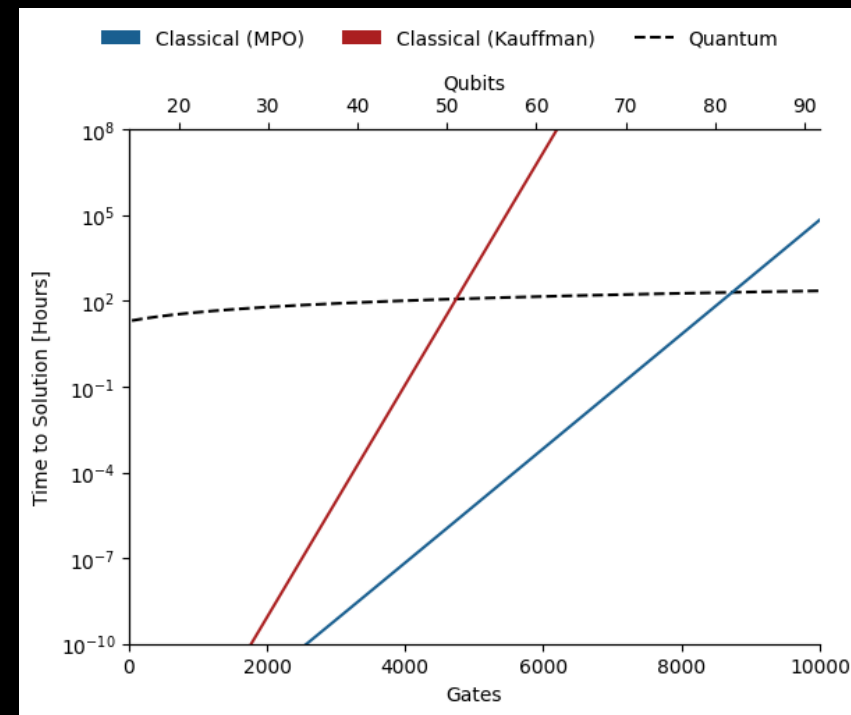
Offers a path to near-term quantum advantage, with concrete benchmarks showing exactly when/where quantum will outperform even large-scale classical HPC.

### Broad Impact:

**HPC:** Pinpoints what workloads would be better handled on quantum over classical supercomputers.

**Mathematics & Topological Data Analysis:** Accelerates large-scale knot computations fundamental to geometry.

**DNA and other biomolecules:** Can be better understood if we can rapidly compute topological properties—this quantum pipeline could eventually yield insights into how DNA strands fold, tangle, and interact in cells.



# Quantum is leading this revolution

**AGE OF DISCOVERY**

- < 20 qubits
- $10^{-3}$  error rate
- System Model H1
- TKET
- InQuanto
- Quantum Origin

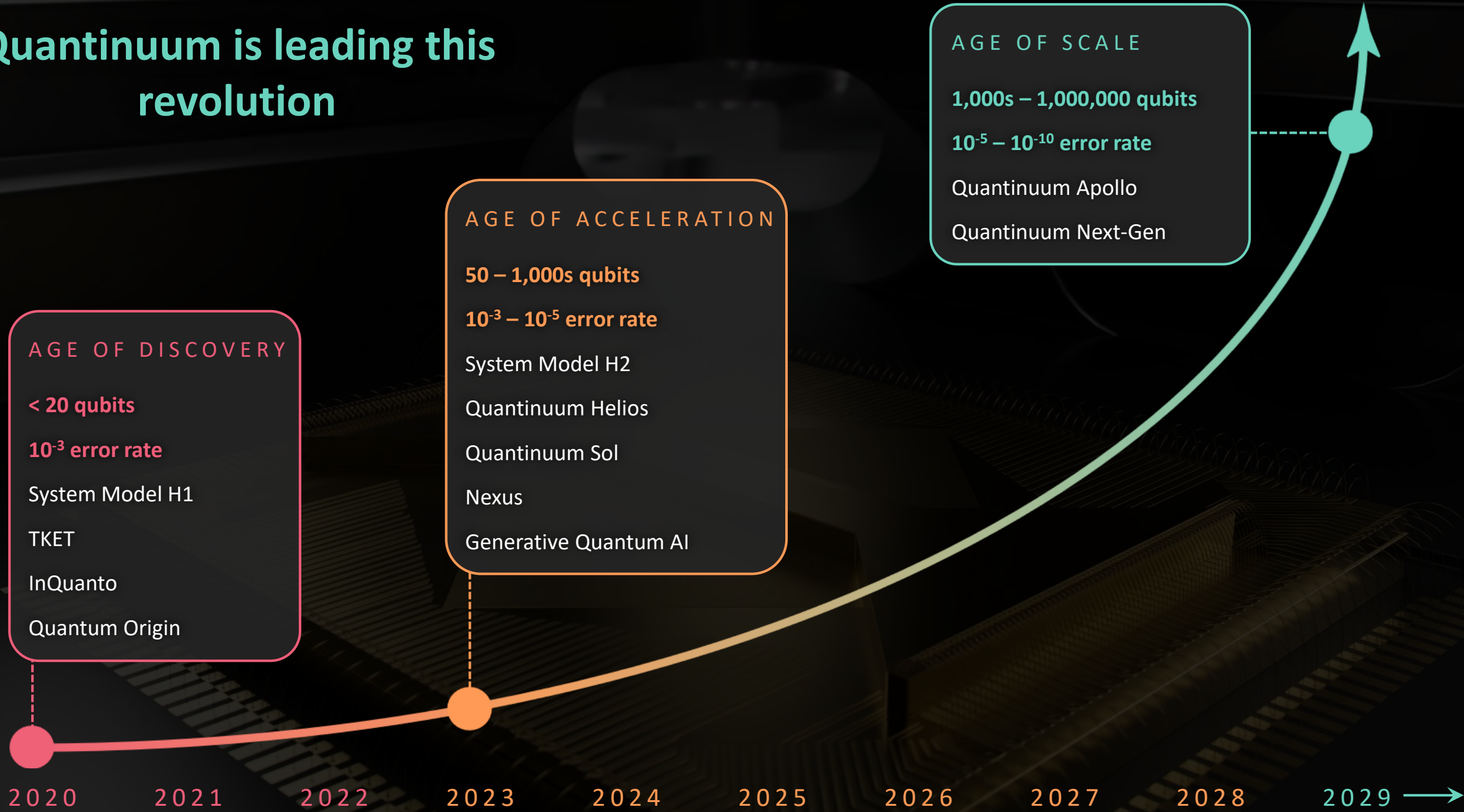
**AGE OF ACCELERATION**

- 50 – 1,000s qubits
- $10^{-3} - 10^{-5}$  error rate
- System Model H2
- Quantinum Helios
- Quantinum Sol
- Nexus
- Generative Quantum AI

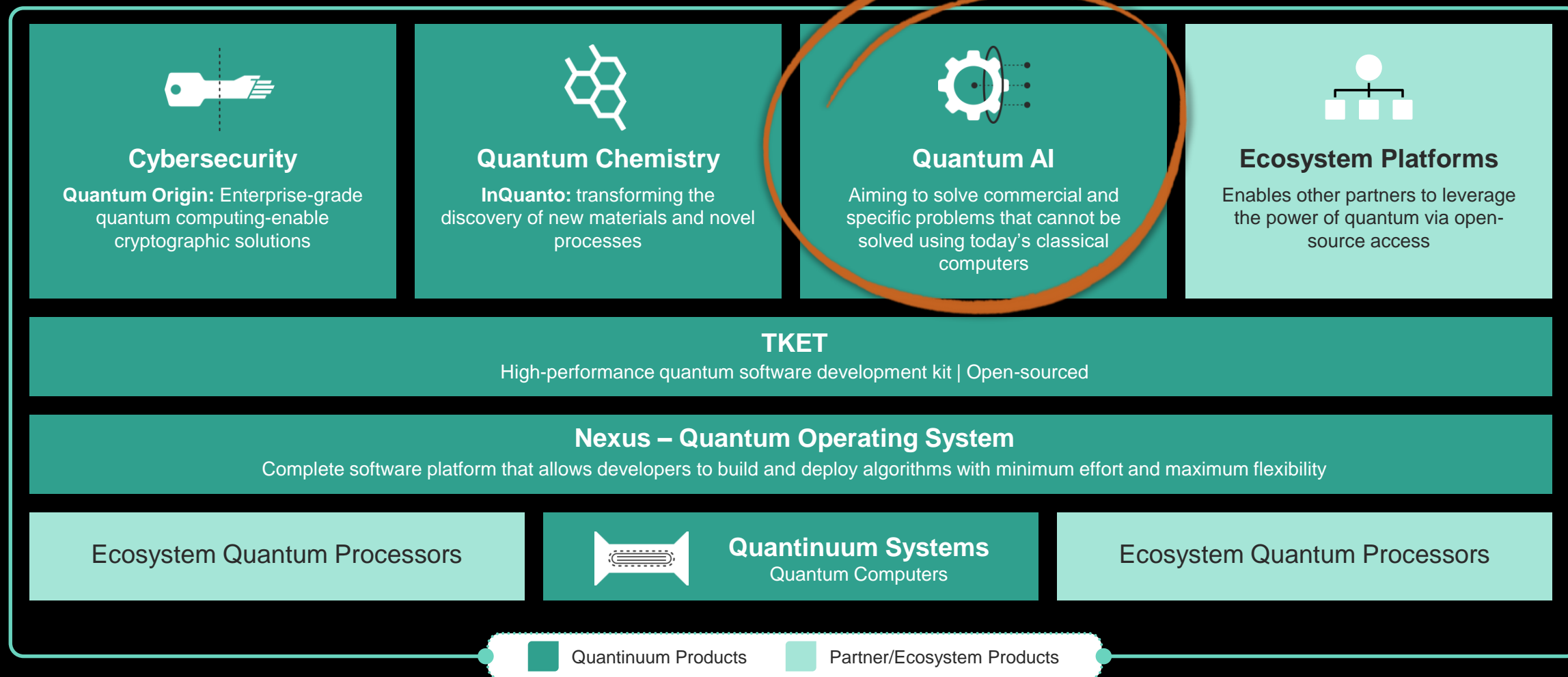
**AGE OF SCALE**

- 1,000s – 1,000,000 qubits
- $10^{-5} - 10^{-10}$  error rate
- Quantinum Apollo
- Quantinum Next-Gen

2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 →

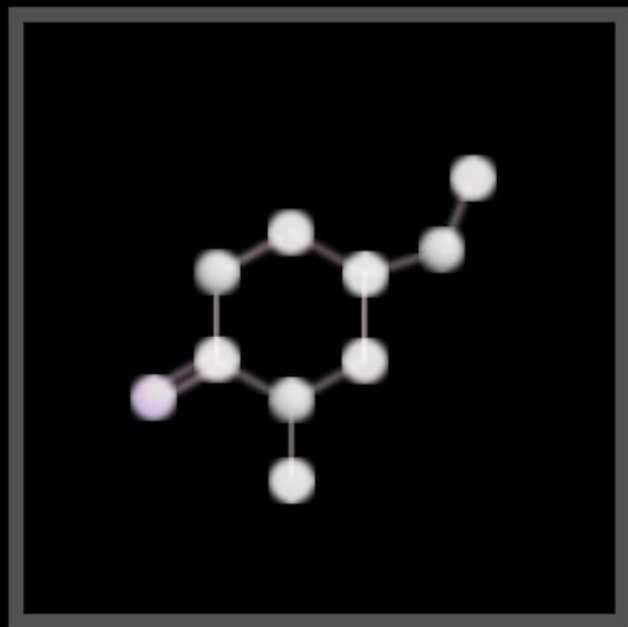


# Our business model is **differentiated and resilient: a true full stack**

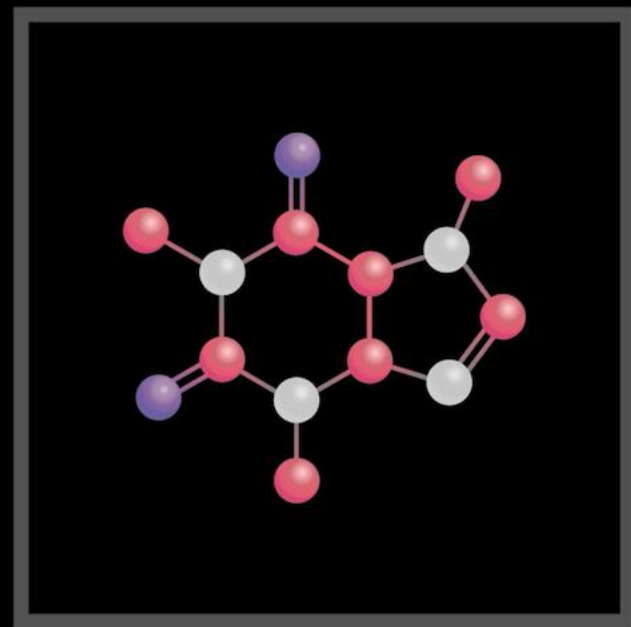


The next industrial revolution

is **AI + QUANTUM**

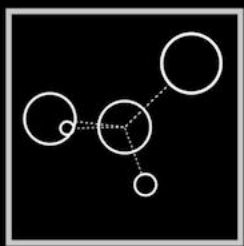


**Classical GenAI Model**



**Target Molecule**

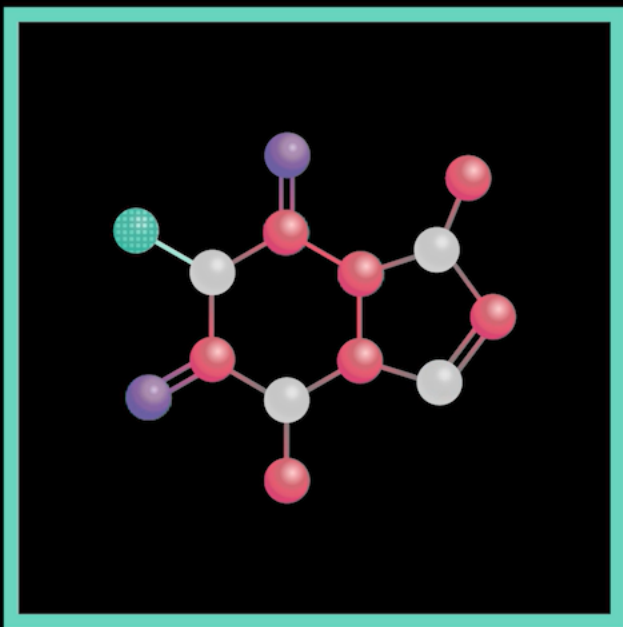
**Classical Data**



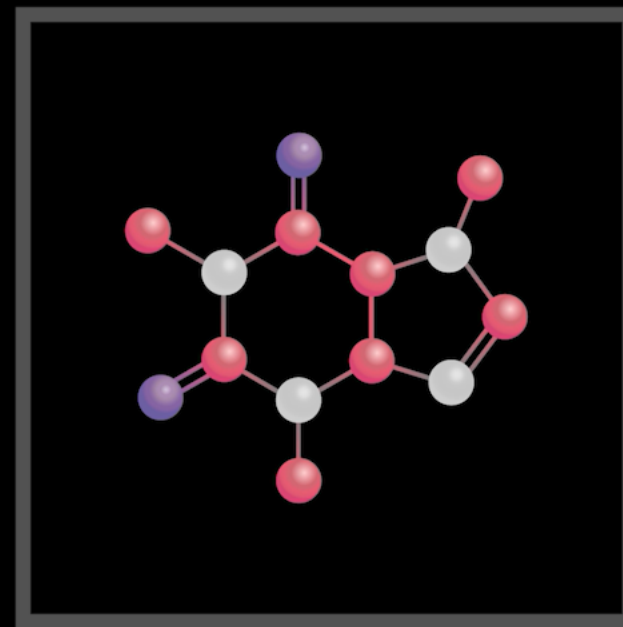
**GenAI**



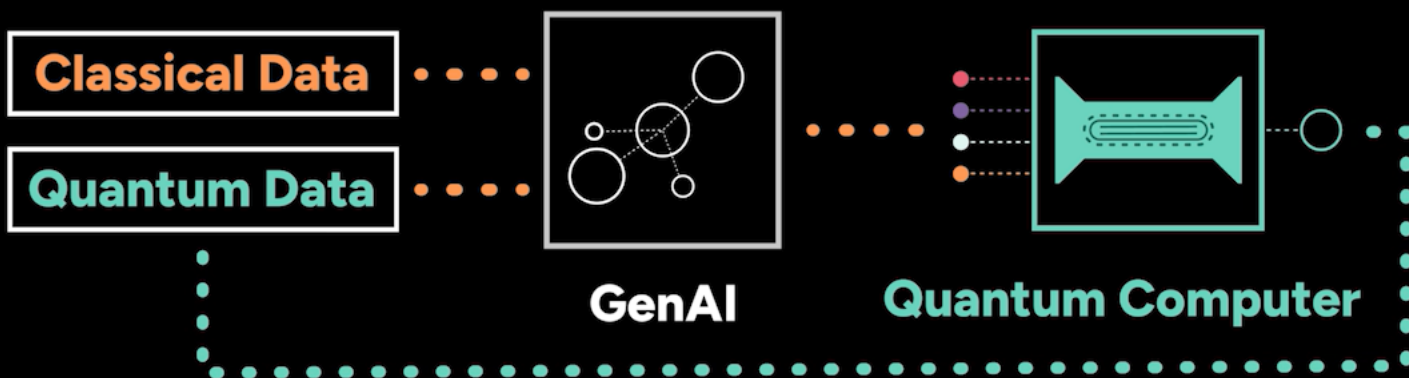
**Classical Result**



**Quantum-Enhanced Model**



**Target Molecule**



QUANTINUUM



**Leading  
the Next  
Industrial  
Revolution:  
Quantum  
Computing +  
HPC + AI**

QUANTINUUM