

Beyond the Binary: The Dawn of Quantum Computing

[Take Our Compatibility Survey](#)

Emerging industries often demand a leap of faith from investors — a willingness to believe in what could be. Quantum computing has long embodied that tension between promise and realization.

The concept dates to the early 1980s, when American physicist Paul Benioff proposed the first quantum mechanical model of a computer. For decades, quantum existed more as an idea than an industry — a place where physics and information science might one day converge to deliver an unprecedented leap in computing power. That convergence is now beginning to take shape.

This week, [Google announced](#) a landmark breakthrough, demonstrating for the first time a quantum computer running a verifiable algorithm at roughly 13,000× the speed of the world's fastest classical supercomputer. While commercial applications remain years away, this milestone signals a tangible step toward bringing quantum computing out of the lab and into the marketplace.

Quantum's Expanding Frontier

Quantum computers excel at modeling quantum mechanical phenomena — the interactions of subatomic particles, molecules, and the nature of matter itself. These capabilities could unlock breakthroughs across drug discovery, personalized medicine, materials science, artificial intelligence, finance, and cybersecurity.

Google's own proof-of-concept underscores this promise. In collaboration with UC Berkeley, researchers used Google's Quantum Echoes algorithm on its Willow chip to study two molecules — one with 15 atoms, and another with 28. The results mirrored traditional Nuclear Magnetic Resonance (NMR) imaging — the same science that powers MRIs — but also revealed new molecular details beyond NMR's reach.

As Google put it, “Just as the telescope and microscope opened up new, unseen worlds, this experiment is a step toward a quantum-scope capable of measuring previously unobservable natural phenomena.”

Industry Momentum and Competitive Landscape

The race to develop scalable quantum systems is accelerating across both public and private enterprises.

- **IBM** continues to expand its *IBM Quantum Network*, with roadmaps to deliver 100,000-qubit processors by the early 2030s and a strong focus on integrating quantum with classical hybrid computing.
- **IonQ**, one of the few pure-play public quantum companies, is developing trapped-ion hardware and has partnerships with AWS, Microsoft Azure, and Dell for cloud-based quantum access.
- Other innovators such as **PsiQuantum**, **Atom Computing**, **Quantinuum** (a Honeywell-Cambridge Quantum joint venture), and **ColdQuanta (Infleqtion)** are drawing hundreds of millions in venture and strategic capital.

- **Microsoft, Amazon Web Services, and NVIDIA** are investing in quantum simulation tools and software ecosystems, betting that profits may come from enabling rather than building quantum hardware.

Collectively, these efforts are forming a layered value chain:

- Hardware firms pursuing quantum supremacy,
- Middleware developers advancing error correction and hybridization, and
- Cloud providers delivering quantum-as-a-service to democratize access.

The Dawn of Quantum Computing

Quantum computing's trajectory is no longer purely academic. Google's latest milestone, alongside breakthroughs from IBM, IonQ, and PsiQuantum, demonstrates that quantum advantage — once an abstract concept — is inching toward commercial reality.

For investors, the opportunity is to identify which technologies will underpin that transition. Quantum computing today is analogous to where classical computing was during the 1930s and 1940s — when Claude Shannon and Alan Turing helped transform theory into applied computation. Each year brings new milestones: higher qubit counts, faster algorithms, lower error rates, and early real-world demos. As an investor, staying informed about this field is crucial. The winners of the quantum race (be it particular companies or countries) stand to gain significant competitive advantage and rewards.

The next decade will determine whether quantum becomes the next great computing revolution or remains a scientific marvel awaiting its commercial dawn. If the past 75 years belonged to the transistor and classical computing, the next 75 may well belong to the qubit and quantum computing.

DISCLOSURE: Securities highlighted or discussed in this communication are mentioned for illustrative purposes only and are not a recommendation for these securities. Evergreen actively manages client portfolios and securities discussed in this communication may or may not be held in such portfolios at any given time. This material has been prepared or is distributed solely for informational purposes only and is not a solicitation or an offer to buy any security or instrument or to participate in any trading strategy. Any opinions, recommendations, and assumptions included in this presentation are based upon current market conditions, reflect our judgment as of the date of this presentation, and are subject to change. Past performance is no guarantee of future results. All investments involve risk including the loss of principal. All material presented is compiled from sources believed to be reliable, but accuracy cannot be guaranteed and Evergreen makes no representation as to its accuracy or completeness.