

## CALCULATING AGAINST A WALL



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### A CENTURY IN THE MAKING

For nearly a century, we have been computing on technologies governed by a physics no one has truly understood, quantum mechanics, yet using a strictly binary logic. In 1935, Einstein himself refused to accept its strangeness. A year later, Alan Turing imagined a single machine able to carry out any calculation a human could, the theoretical blueprint of every computer that followed, and in the same stroke he traced the outer limits of what computation can ever reach.

The first real machines, built a decade later, were designed in part to break war-time codes, the very task quantum computer may one day master again. In 1981, Richard Feynman identified a different wall: even within those limits, our classical machines cannot efficiently simulate the way nature actually behaves, and the way through was to build a machine that is itself quantum.

Quantum mechanics remains the most predictive theory ever devised and, in many respects, the least understood: a logic we exploit daily without fully grasping it. Quantum computing is not simply a faster computer but an attempt to cross that wall, replacing binary bits with qubits that, through superposition and entanglement, hold many states at once.

After decades confined to theory, real progress in hardware, error correction and algorithm design is finally making the idea tangible, shifting quantum computing from a scientific curiosity to a genuine long-term investment theme. The market is still tiny, just over \$1bn today, yet it could exceed \$16bn by 2035 as applications surface across pharmaceuticals, finance and cybersecurity.

For the first time, markets are beginning to put a price on it.

### A NASCENT BUT FAST-GROWING UNIVERSE

As an investment theme, quantum resembles early-stage AI or biotech: high uncertainty, but considerable optionality. A small group of listed pure-plays (IonQ, Rigetti and D-Wave) are racing along divergent technological paths, with still-modest revenues but strong momentum. IonQ alone is expected to more than double its revenue in 2026, an early sign of commercialisation, supported by rising public funding and private capital.

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For broader and less volatile exposure, the large platforms (IBM, Google, Microsoft and Amazon) keep investing heavily in their own quantum capabilities. The clearest signal of investor appetite came in June 2026, when Quantinuum, spun out of Honeywell's quantum division and merged with Cambridge Quantum, raised roughly \$1.68bn in the largest quantum-focused IPO to date, achieving a valuation in the mid-teens of billions. Notably, it chose a traditional listing rather than the SPAC route taken by most peers, a sign of genuine institutional demand. Yet the same listing exposed the gap between price and fundamentals: barely \$30m of 2025 revenue, deeply loss-making, with Honeywell retaining control, a reminder of the heavy R&D still required to scale the technology.

### THE HIDDEN RISK AND THE LONG GAME

The most overlooked implication of quantum is not its upside but its threat. The encryption underpinning online banking and the plumbing of global finance could one day be broken by a sufficiently powerful machine, raising material long-term risks for data security and transaction integrity, which is why governments and institutions already fund "post-quantum cryptography" designed to resist it, while new standards and regulatory frameworks begin to take shape around it.

The contest is also geopolitical: the United States and China are funding quantum as a strategic technology, turning encryption and secure communications into questions of national sovereignty as much as of markets. The same force cuts both ways: quantum could also sharpen derivatives pricing, portfolio optimisation, and stress testing, ultimately reshaping how risk itself is managed across the industry.

Seen clearly, this is a long-duration structural theme rather than a near-term earnings story, where government support, accelerating innovation and growing capital-markets activity all point in the same direction. However, timing remains crucial: the long-term upside must be balanced against significant near-term volatility and execution risks.

The question has never been whether quantum will reshape industries, but rather who will capture the value, and at which point on a journey that began long before any of us could price it an investor chooses to step in.



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