

## Quantum Computing Is Today's Manhattan Project

*di Tom Tugendhat*

In Colorado, a machine the size of a small car holds single atoms suspended in an electromagnetic cage. [Helios](#), the most advanced quantum computer ever built, manipulates them with lasers to solve complex questions that would take conventional machines centuries.

This is a modern-day Manhattan Project, again a partnership between the U.K. and the U.S. The team behind Helios began in 2014 as Cambridge Quantum in England before joining with Honeywell Quantum Solutions, an arm of the U.S. industrial giant, to create Quantinuum. The field of quantum computing makes possible cracking encryption, creating innovative technologies, and discovering new drugs. Classical computers process information as ones or zeros in bits. A quantum computer uses qubits—shorthand for quantum bits—to harness the behavior of subatomic particles, which can exist in multiple states at once. That lets it explore vast numbers of possibilities simultaneously, a capability that could accelerate artificial intelligence development.

The Quantinuum team had a major breakthrough this month, solving quantum computations using 94 error-protected logical qubits. Quantum machines are sensitive to noise, or outside interference that disrupts a qubit's state and causes errors. This test demonstrated that the computer can correct errors from qubits, indicating that larger computers without errors are possible.

The comparison with Los Alamos may sound extreme, but the stakes are comparable. A nation that masters this technology will be able to break any standard encryption on earth and accelerate other sciences beyond the understanding of countries without quantum computing. This holds the same profound implications for defense and intelligence today as nuclear physics did 80 years ago.

Quantinuum couldn't have been built by one country alone. The software, algorithms and theoretical science came from the U.K. The hardware, manufacturing infrastructure and capital came from Honeywell and the U.S. investment ecosystem. Cambridge Quantum's founder, Ilyas Khan, was a fellow of the University of Cambridge Judge Business School. Quantinuum's chief executive spent nearly 25 years at Intel. Its head of AI previously worked at Google DeepMind in London. This is an Anglo-American enterprise in its DNA, just like the Manhattan Project, though this time our race is against China.

In 1943 the Quebec Agreement formalized a collaboration between British and American scientists who would build the atomic bomb. The Americans provided scale, industrial capacity and money, building on scientific breakthroughs from Britain. The British government moved its nuclear work to the U.S. to complement the work done by U.S.-based scientists. Together they changed the world.

Britain has produced more than 70 quantum companies. PsiQuantum emerged from research conducted at the University of Bristol and now is based in Silicon Valley. Oxford Ionics, acquired by IonQ for more than \$1 billion, is an Oxford University Innovation spinout. Riverlane in Cambridge is building quantum error-correction technology that may prove as important as the hardware itself. The U.K.'s 10-year National Quantum Strategy is backed by £2.5 billion (about \$3.3 billion). Under the Aukus security partnership among the U.S., U.K. and Australia, the Quantum Arrangement known as AQuA is already accelerating joint military quantum capabilities.

The U.S. brings scale, capital markets and defense procurement to turn breakthroughs into deployed systems. Together with the U.K. we are in the lead.

But others are moving fast. China has committed an estimated \$15 billion to quantum research, with its new Five-Year Plan listing quantum among high-priority future industries. Origin Quantum in 2023 announced the sale of China's first commercial quantum computer and made the Origin Pilot operating system open source this year, allowing it to reach beyond U.S. export controls. France has committed €1.8 billion (about \$2.07 billion). Germany €3 billion, Japan \$7.4 billion. Major world powers know this technology will deliver a strategic advantage for the rest of the century.

There are echoes of the explosion in artificial intelligence. In December 2015, Sam Altman, Elon Musk and others co-founded a small laboratory in San Francisco called OpenAI. Almost nobody noticed until seven years later when ChatGPT arrived and the world understood that AI companies had achieved a massive technological leap.

Quantum computing is perhaps a decade behind AI. The science is real, and the money is flooding in, but it is still a niche field. While AI companies are raising hundreds of billions of dollars, quantum investment is measured in single-digit billions.

That is changing. While global public investment exceeded \$10 billion early last year, [IBM](#) has targeted 2026 to demonstrate scientific quantum advantage. Google's Willow chip has shown error correction improving with additional qubits, a milestone pursued for 30 years. With the last stage complete, Quantinuum's road map targets fault-tolerant quantum computing—where the computer can operate correctly even in the presence of errors—by 2030. To get there, majority-owner Honeywell announced plans in January for an IPO expected to value Quantinuum at \$10 billion.

But this story is about more than money. As in 1943, most people haven't yet grasped what is coming. When they do, the countries that moved first will hold advantages and those that didn't will discover that the future belongs to those who build it themselves.

*Mr. Tugendhat, a Conservative, is a member of the British Parliament and a distinguished fellow at the Hudson Institute.*