

IBM Expands Quantum Data Center in Poughkeepsie, New York to Advance Algorithm Discovery Globally

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Latest IBM Quantum system, powered by an IBM Quantum Heron processor, achieves reduced error rates at 16 times better performance, and 25-fold increase in speed over 2022 IBM Quantum systems.(1)

IBM completes installation of second IBM Heron, its most performant quantum processor to date, now available to clients globally.

Company announces all quantum systems in Poughkeepsie and globally can operate at utility-scale, beyond brute-force simulation capabilities of classical computers.

POUGHKEEPSIE, N.Y., Sept. 26, 2024 /CNW/ -- IBM (NYSE: **IBM**) announced today the completion of its latest expansion of the IBM Quantum Data Center in Poughkeepsie, New York, which operates the highest number of available utility-scale quantum computers at a single location in the world. These systems are a part of the more than a dozen quantum computers offered to global clients via the IBM cloud.

To advance its mission of bringing useful quantum computing to the world, IBM has heavily invested in deploying advanced quantum hardware architectures. First introduced late last year, the IBM Quantum Heron processor has now been deployed in IBM's global Quantum Data Center in Poughkeepsie.

Now available via the cloud, IBM's Heron-based system offers up to a 16-fold improvement in performance and a 25-fold increase in speed over previous IBM quantum computers as they were measured two years ago. In addition to the two IBM Heron-based computers now available, the additional systems within the IBM Quantum Data Center in Poughkeepsie are now all capable of operating at the level of utility-scale: the point at which quantum computers

can run quantum circuits more accurately than classical computers simulating them. In turn, this opens the possibility to explore new computational territories for global users who are pushing forward the discovery of new quantum algorithms that will unlock quantum advantage.

IBM's users are now tapping the improved performance capabilities of IBM Heron and IBM utility-scale systems to build quantum algorithms for their industries with Qiskit, IBM's quantum software stack, which has been built to simplify programming quantum computers.

"Since IBM made the first quantum computer available on the cloud in 2016, we have broken barriers across quantum hardware and software to build our largest and highest-performing fleet of globally accessible quantum systems," said Jay Gambetta, Vice President at IBM Quantum. "Our quantum data center in Poughkeepsie is the epicenter of these efforts, with more organizations around the world using our systems here in the Hudson Valley to explore industry-relevant problems on real quantum hardware. As we continue to expand our quantum computers in Poughkeepsie and globally, we will work with our network of more than 250 organizations to accelerate the pace of discovery in quantum computing."

Recently, IBM published **evidence** that Qiskit is the leading and most performant quantum software. These breakthroughs are now enabling the emergence of a global ecosystem of quantum software and services, including offerings in the Qiskit Functions Catalog from startups such as Algorithmiq, Q-CTRL, and Qedma to abstract away the complexity of managing the performance of quantum systems; as well as tools from QunaSys and Q-CTRL to help users more easily explore chemistry and optimization problems. These tools are designed to make it easier to build and run utility-scale quantum algorithms that could open the doorway to useful quantum computing.

"When you are focused on achieving algorithmic quantum advantage, working with highly reliable, stable, and high-performing quantum hardware is essential. We chose to partner with IBM because their quantum computers offer the advanced engineering and performance we need to meet our goals with confidence," said Dorit Aharonov, Chief Scientific Officer of Qedma Quantum Computing.

"IBM has been a leader in both the development of quantum hardware and the realization of a high-performance, flexible quantum computing platform for the community. The IBM team had exceptional foresight in de-verticalizing and empowering their partners to push the limits of what's possible with today's machines. We're proud to have our **record-breaking** performance-management and optimization solutions available through Qiskit Functions to deliver value to the widest range of users," said Michael Biercuk, CEO of Q-CTRL.

"IBM's leadership in quantum hardware development exemplifies its relentless pursuit of performance innovation, enabling cutting-edge, utility-scale work while offering a seamless, frictionless development experience for partners and users alike, thanks to the Quantum Cloud service and Qiskit ecosystem. This commitment is why Algorithmiq

has chosen IBM's platform to include its groundbreaking error mitigation algorithm within the Qiskit Functions Catalog to unlock greater access to real-world applications at utility scale and beyond," said Sabrina Maniscalco, CEO of Algorithmiq.

"As IBM advances quantum hardware with its latest Heron processor, we are excited to see QunaSys' algorithms running on this cutting-edge technology. We believe that having our QURI Chemistry operate at utility scale on Heron-powered systems, via the Qiskit Functions Catalog, is a key to achieving quantum advantage. QunaSys is committed to advancing our solutions, believing this synergy is essential to unlocking quantum computing's full potential," said Tennin Yan, CEO of QunaSys.

Strengthened by close communication with New York State and federal policymakers, IBM plans to continue to upgrade and grow its IBM Quantum Data Center in Poughkeepsie as it progresses along its Quantum Development Roadmap to extend the complexity and size of quantum workloads that users can run. The Poughkeepsie data center will continue to serve as a global hub for IBM's Quantum Network as the company extends its worldwide fleet of systems, including the second IBM Quantum Data Center which will soon open in Ehningen, Germany.

In addition to quantum computing, IBM plans to continue to nurture the broader technology ecosystem in New York to unlock new discoveries and opportunities across semiconductors, hybrid cloud, and artificial intelligence.

Statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

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The performance of IBM Quantum hardware is publicly available here:

<https://quantum.ibm.com/services/resources>

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