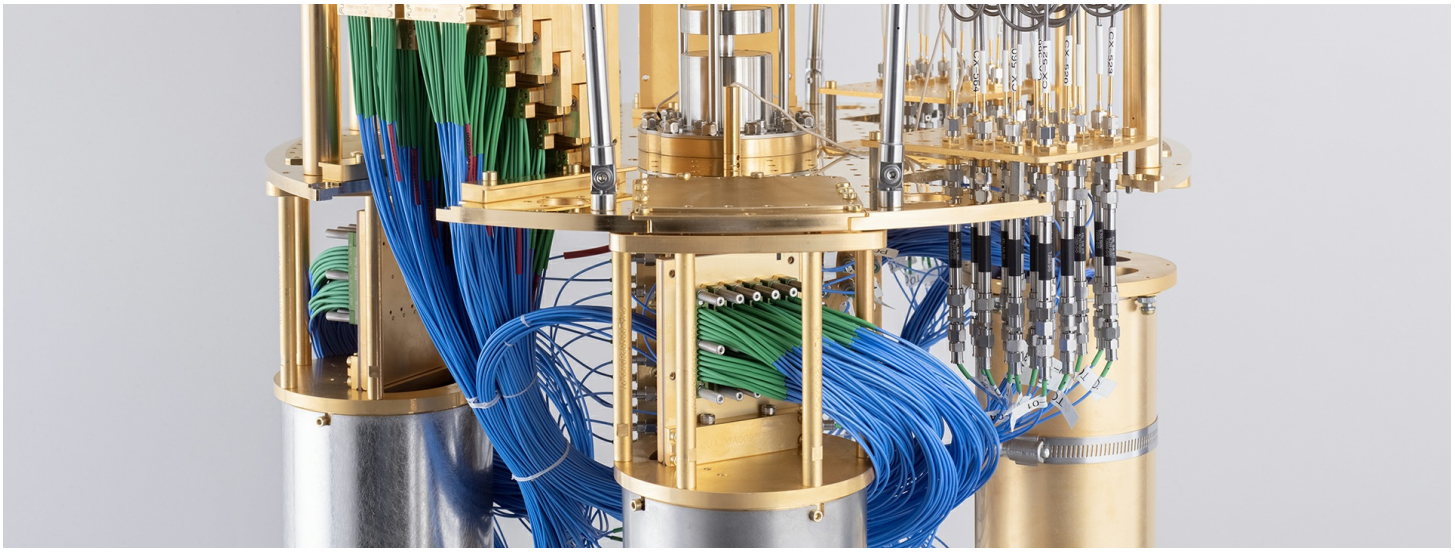
IBM Newsroom

IBM and Pasqal Plan to Expand Quantum-Centric Supercomputing Initiative

As part of intended quantum-centric supercomputing collaboration between Pasqal and IBM, unified programming model built on Qiskit will aim to integrate various quantum and classical hardware resources for advanced HPC workflows



Yorktown Heights, New York, and Paris, France, November 21, 2024– IBM (NYSE: IBM) and Pasqal today announced an update to their intended collaboration to build new, integrated frameworks for quantum-centric supercomputing with Qiskit, the world's most performant quantum software.

The two companies will soon begin developing a unified programming model to facilitate seamless interoperability across different types of quantum computing hardware. This integrated architecture will work across IBM's next-generation and utility-scale quantum computers, Pasqal's neutral atom-based quantum devices, and classical high-performance computing (HPC) resources such as CPUs and GPUs. It will aim to accelerate the usability and performance of complex and hybrid HPC workflows, which will include quantum computers as a key pillar, by allowing users to select the best-fitting hardware for each task in a single, cohesive framework.

The goal of this model for the quantum and HPC communities is to enable effective collaboration between HPC centers and quantum hardware providers with advanced quantum software, fostering market adoption for quantum technologies.

As a first step in this journey, Pasqal will soon provide users of the open-source Qiskit SDK access to their neutral atom quantum hardware. As a result, it will soon be possible for Qiskit SDK users to program Pasqal's analog neutral-atom QPUs, providing users the flexibility to access and utilize either IBM's or Pasqal's hardware.

"We are excited to see our collaboration with IBM take the next step on the path to integrate quantum with classical computing resources," said Georges-Olivier Reymond, CEO and Co-founder of Pasqal. "Our work together will mark an essential step towards enabling quantum developers and end users to soon be able to leverage different types of hardware within a cohesive HPC workflow, choosing the most suitable resources based on the unique requirements of each computational task."

"We are excited to continue partnering with Pasqal towards a classical and quantum programming model that is flexible,

including being hardware- and architecture-agnostic. In addition to our work to build Qiskit to more broadly enable seamless orchestration between different computing paradigms, this initiative aims to help users develop quantum-centric supercomputing algorithms and applications with minimal technical burden. Such a unified software stack will also help to set a framework for hybrid workflows that will redefine computing as we know it," said Jay Gambetta, Vice President, IBM Quantum.

Open Source Access

In line with Pasqal's and IBM's commitment to open-source principles, the unified programming model will begin with Pasqal providing Qiskit users access to their devices. This will ensure accessibility for developers, researchers, and organizations interested in exploring and advancing quantum applications in HPC settings.

As quantum computing continues to grow in both capabilities and use cases, Pasqal and IBM remain committed to creating accessible, versatile, and robust solutions for the global computing community. Pasqal's and IBM's plans for this collaboration highlight the potential of quantum-centric supercomputing to address some of the world's most complex computational challenges, unlocking new possibilities for HPC applications.

About Pasqal

Pasqal is a leading Quantum Computing company that builds quantum processors from ordered neutral atoms in 2D and 3D arrays to bring a practical quantum advantage to its customers and address real-world problems. Pasqal was founded in 2019, out of the Institut d'Optique, by Georges-Olivier Reymond, Christophe Jurczak, Professor Dr. Alain Aspect – Nobel Prize Laureate Physics, 2022, Dr. Antoine Browaeys and Dr. Thierry Lahaye. Pasqal has secured more than €140 million in financing to date. To learn more about Pasqal, visit www.pasqal.com.

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