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Japan's AIST Adds NVIDIA System to Further QC-Classical Computing Research Efforts

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RECENT DEVELOPMENT

Japan's National Institute of Advanced Industrial Science and Technology (AIST), in collaboration with US GPU supplier NVIDIA, has stood up a [classical HPC platform called the ABCI-Q system](#) that supports research focused on hybrid quantum-classical computing. The system is hosted at AIST's Global Research and Development Center for Business by Quantum-AI Technology (G-QuAT), a recently formed entity tasked with advancing research in quantum technology, creating new global markets utilizing quantum computing (QC) technology and generating economic value through industry collaboration.

The ABCI-Q classical platform is comprised of 2,020 NVIDIA H100 GPUs interconnected by NVIDIA's Quantum-2 InfiniBand platform, which makes it one of the world's most powerful systems solely dedicated to QC research. The ABCI-Q supports a modular, multi-qubit architecture that will eventually incorporate a superconducting qubit system from Fujitsu and a photonic qubit system from OptQC, both Japan-based, as well as a recently installed neutral atom qubit system from US-based QuEra. AIST also recently signed collaboration agreements with trapped ion qubit supplier US-based IonQ and the photonic qubit QC supplier ORCA of the UK.

ANALYST COMMENT

Quantum computing development continues apace on a global scale, and many QC watchers anticipate that utility-class QCs, working in concert with classical counterparts, may only be 2-3 years away. As such, QC developer and end user interest is shifting from QC research towards exploration of real-world use cases, focusing on hybrid quantum-classical systems and the role they can play in facilitating the integration of QC systems into a wide range of existing and planned HPC computational workloads. The G-QuAT agenda is ambitious but noteworthy. Technically, it seeks to tap into significant classical compute capability to better explore high performance hybrid algorithms and covers a range of quantum modalities, qubits, and quantum processor designs most appropriate for specific algorithms. More holistically, the program includes a wide range of vendor options from both domestic and foreign sources while targeting the economic advantage of QCs in collaboration with the industrial sector.

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