

Quantum Brilliance Announces Strategic Collaboration with Oak Ridge National Laboratory

Researchers to advance parallel quantum computing integration with high-performance computing

CANBERRA, AUSTRALIA, September 4, 2024 /EINPresswire.com/ -- STUTT GART, GERMANY -- [Quantum Brilliance](#) (QB), a global leader in diamond-based quantum technology, today announced a strategic collaboration with [Oak Ridge National Laboratory](#) (ORNL) to build a joint platform that enables collaborative development of quantum computing with high-performance computing (HPC) by exploring the on-premises integration of QB's quantum computing cluster into HPC systems at ORNL.



A diamond-based, rack-mountable quantum accelerator from Quantum Brilliance

This collaboration aims to enhance the synergy between quantum and classical computing by leveraging QB's deployable room-temperature diamond quantum accelerators and ORNL's state-of-the-art HPC infrastructure. It underscores both organisations' commitment to pushing the boundaries of computational capabilities and advancing scientific research, marking the beginning of a long-term partnership.

By joining forces, QB and ORNL demonstrate their leadership in the evolving quantum computing industry, operating at the forefront of integrating on-premises quantum computing hardware with HPC infrastructure, pioneering this groundbreaking field of technology.

Key Objectives of the Collaboration

The collaboration will focus on integrating an on-premises cluster of QB's quantum accelerators with ORNL's HPC systems to explore the performance and effectiveness of parallelised and hybridised quantum computing. Parallel quantum computing refers to multiple quantum

processors working together to solve a problem. Hybrid quantum computing refers to both quantum and classical processors working together on a problem.

“Parallel quantum computing holds transformative potential for scientific discovery and industrial applications that require high-performance computing,” said Dr. Travis Humble, Director, Quantum Science Center at ORNL. “Partnering with Quantum Brilliance allows us to explore effective integration with our existing HPC systems, paving the way for groundbreaking advancements that will inform the design of future HPC infrastructure.”

The team plans to co-develop new computational methods that exploit parallel and hybrid computing and new software tools that will enable users to implement those methods and develop their own. New knowledge of the hybrid computing systems is expected to enable ongoing co-design of superior computing systems, and the infrastructure tools and practical know-how to manage operations.

The inclusion of quantum accelerators alongside high-powered classical computing opens the door for the discovery of solutions to certain complex problems currently unsolvable with classical computing alone.

“This collaboration represents a significant milestone in our mission to bring quantum computing to practical applications,” said Mark Luo, CEO of Quantum Brilliance. “By integrating the world’s first cluster of room-temperature QPUs with ORNL’s leading HPC infrastructure, we aim to demonstrate the benefits of parallel quantum computing. This is a critical milestone towards achieving massively parallelised quantum accelerators, which we believe will be the preferred architecture in HPC centres.”

Quantum Brilliance’s efforts are supported by the funding from the [ACT Government](#).

About Quantum Brilliance

Quantum Brilliance, founded in Australia in 2019 and grown out of research conducted at the Australian National University, is a global leader in diamond-based quantum technology. QB specialises in diamond quantum materials and the development of small, ruggedized diamond quantum accelerators that operate at room temperature, offering a scalable and energy-efficient solution for various applications. These accelerators are complemented by a range of software and application tools and are exported globally, today. As a full-stack hardware and software company, with operations in Australia and Germany, QB’s mission is to enable the mass deployment of quantum technology, facilitating its integration into everyday devices and high-performance computing systems.

About Oak Ridge National Laboratory

UT-Battelle manages ORNL for the DEPARTMENT OF ENERGY’s Office of Science, the single largest supporter of basic research in the physical sciences in the United States. DOE’s Office of Science is working to address some of the most pressing challenges of our time. For more

information, visit energy.gov/science.

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