

Quantum Elements and Planckian Announce Partnership to Improve New Superconducting System Design

Companies to Develop Digital Twin Capabilities to Enhance Quantum Error Correction (QEC)

LOS ANGELES, CA, UNITED STATES, July 15, 2026 /EINPresswire.com/ -- [Quantum Elements](#), a provider of AI-powered digital twins for quantum computing developers, today announced a

development agreement with [Planckian](#), an Italian quantum computing company pioneering a novel superconducting quantum processor architecture, to support Planckian's error correction strategy.

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*Michele Dallari, co-founder
and CEO of Planckian*

Through this collaboration, Quantum Elements will develop architecture-specific noise models and digital twin capabilities to characterize the physical noise environment of Planckian's superconducting architectures, accounting for coherence, leakage and operation-level error sources.

The work will support Planckian in evaluating QEC schemes' performance across its unique processor designs.

“Our Digital Twins platform can accurately mirror quantum systems on classical computers, leading to a clear development path from system co-design to quantum error correction and all the way to fault-tolerant quantum computing for Planckian and other quantum hardware companies,” said Izhar Medalsy, co-founder and CEO of Quantum Elements. “We’ve shown that both theoretically and practically.”

“Our architecture removes the control complexity and infrastructure overhead that typically prevents conventional superconducting processors from scaling. However, a new approach also reshapes the errors the system has to contend with,” said Michele Dallari, co-founder and CEO of Planckian. “That makes architecture-specific characterization essential: we need a faithful picture of our own noise environment before we decide how to correct it. Quantum Elements' digital twins enable us to evaluate error-correction schemes against a realistic model of our processors, on classical hardware and well ahead of scaling, the kind of groundwork a credible path to fault tolerance actually depends on.”

While quantum processors are becoming increasingly sophisticated, they are still affected by environmental noise, crosstalk between qubits, and control imperfections. These effects are obstacles to developing fault-tolerant quantum computers. To study this behavior, researchers often simulate quantum systems on classical computers. One way to do this is direct density-matrix simulation, which tracks a noisy quantum system, including both its quantum state and its interaction with the environment. However, the amount of information required to represent the system becomes prohibitive as qubit counts grow.

Quantum Elements' Digital Twins technology allows researchers to model noisy quantum-circuit behavior with lower computational resources while preserving the dynamics needed to study quantum error correction, correlated noise, and decoder performance.

The practical application of this method was demonstrated in an [AWS collaboration](#) with Quantum Elements, USC, and Harvard, where researchers used a Quantum Monte Carlo-accelerated digital twin to simulate a 97-physical-qubit, distance-7 surface-code syndrome-extraction round on classical high-performance computing infrastructure. AWS reported that a brute force, full open-system simulation of the same system would require tracking 497 density-matrix entries, while the QMC-based method ran in about an hour on a single compute node.

About Planckian

Planckian is developing the core technology to power utility-scale quantum computers. By design, our chip architecture decouples control lines from qubit count, removing a key bottleneck in scaling. It combines the proven reliability of superconducting circuits with a new approach to qubit control, paving the way for quantum computers capable of solving the world's most challenging problems. Launched in 2023, Planckian is proudly building from the heart of a world-class research ecosystem in Italy.

About Quantum Elements

Founded in 2023 in Los Angeles, Quantum Elements seeks to transform the quantum computing industry by making the path to real-world commercial applications more efficient and cost-effective through its proprietary, AI-native software stack and world-leading quantum Digital Twins.

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