

2026 Moossa J. Arman Colloquium in Physics

Designing the Accelerated Quantum Supercomputer: AI-First, Real-Time Required

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Quantum computing is often framed as a hardware challenge, but the next breakthroughs will come from the fusion of AI, advanced systems software and real-time quantum–classical integration. As quantum processors scale, the bottlenecks shift: calibration becomes a data problem, decoding becomes an AI problem and system performance becomes a real-time orchestration problem.

This talk will explore how accelerated emulation, AI-driven calibration and decoding and ultra-low-latency quantum–classical links are redefining what a quantum computer is. These capabilities enable rapid iteration, higher-quality qubits and system-level designs that were previously out of reach, opening the door to architectures that can genuinely scale.

By examining the emerging blueprint of an accelerated quantum supercomputer, we will look at the key requirements for building such systems — from real-time control to heterogeneous acceleration — and how advances across the ecosystem are bringing this future closer, faster and with far greater impact than qubits alone could achieve.