

NTU Q

UPCOMING EVENT

QISKIT HACKATHON TAIWAN 2026

- Time: 12th - 14th August
- Registration deadline: 12th June
- Venue: 1F, Center for Condensed Matter Sciences and New Physics Building, National Taiwan University

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HIGHLIGHTING NEWS

QUANTUM STATE TELEPORTATION VIA MOBILE SPIN QUBITS IN SILICON

Recent work demonstrates a silicon-based “conveyor belt” architecture that enables the controlled transport of electron spin qubits while preserving their quantum states. The approach addresses a key limitation in spin-qubit systems, where short-range exchange interactions require qubits to be placed in close proximity, leading to wiring complexity and scalability challenges. By applying travelling-wave potentials through sinusoidal voltage signals, qubits can be physically shuttled across the device and brought together only when interaction is needed.

The study shows that mobile qubits can perform logical operations and generate entanglement with error rates comparable to static configurations, while also benefiting from reduced noise through motional averaging effects. A key demonstration is quantum state teleportation over a distance of 320 nm, confirming that quantum information can be reliably transferred between qubits during transport.

This architecture offers a potential solution to the “fan-out” problem in large-scale quantum circuits by reducing wiring density and enabling more flexible layouts. It also opens the possibility of modular designs, where qubits are dynamically routed between functional regions such as storage, manipulation, and readout. While significant challenges remain for scaling to millions of qubits, this work represents an important step toward practical, error-corrected quantum processors.

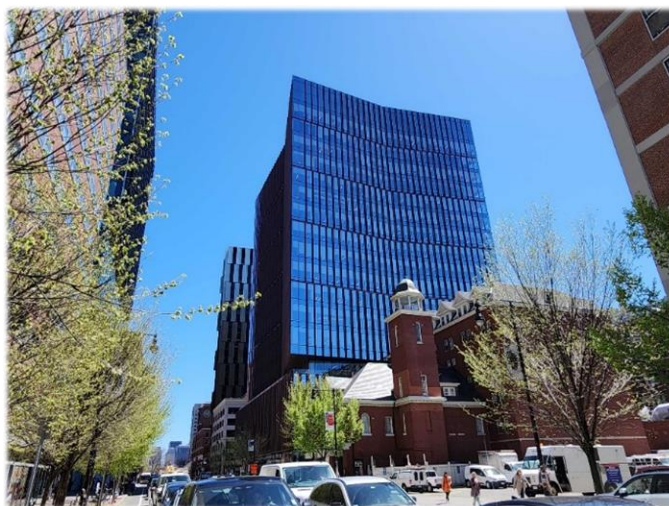
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MIT–IBM LAUNCHES JOINT LAB FOR AI AND QUANTUM COMPUTING

IBM and MIT have launched a joint initiative to advance the convergence of artificial intelligence and quantum computing. The MIT–IBM Computing Research Lab will lead efforts to build hybrid systems that combine AI, algorithms, and quantum technologies. The program aims to develop new computational paradigms integrating quantum hardware, classical computing, and advanced AI methods. Key research directions include efficient language models, enterprise AI systems, and novel quantum algorithms for complex problems in fields such as materials science, chemistry, and biology. The lab will also explore mathematical foundations in machine learning, optimization, and simulation of dynamical systems. By leveraging IBM’s roadmap toward fault-tolerant quantum computing, the collaboration seeks to accelerate practical applications and address challenges across industries, including finance, healthcare, and supply chain optimization.

In addition, the MIT–IBM Computing Research Lab will train the next generation of computational scientists by engaging faculty and students across MIT to accelerate advances in science and engineering. The lab is co-led by researchers from MIT and IBM across AI, algorithms, and quantum. Over nearly a decade of collaboration, the partnership has supported over 200 projects and produced more than 1,500 publications. By combining academic research with industrial-scale resources, the lab aims to advance computational foundations and expand interdisciplinary collaboration.



Street-level view of the MIT-IBM Computing Research Lab in Cambridge, MA.

[READ MORE \(Press Release\)](#)

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