

NTU Q

UPCOMING EVENT

QISKIT HACKATHON TAIWAN 2026

- Time: 12th - 14th August
- Registration deadline: 12th June 16:00
- Venue: 1F, Center for Condensed Matter Sciences and New Physics Building, National Taiwan University

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HIGHLIGHTING NEWS

IBM TO INVEST MORE THAN \$10 BILLION IN QUANTUM COMPUTING, TARGETING FAULT-TOLERANT SYSTEM BY 2029

IBM recently announced that it will commit more than \$10 billion over the next five years to advance quantum computing, aiming to accelerate its goal of delivering the world's first large-scale, fault-tolerant quantum computer in 2029. It is one of the largest single-company investments in the recent global push to industrialize quantum computing.

According to IBM's official statement, the investment will fund research and development, capital expenditure, manufacturing scaling, ecosystem partnerships, and strategic acquisitions. IBM stresses that the move is designed to accelerate progress beyond its existing roadmap—rather than merely fulfill current plans—and to advance quantum leadership anchored in the United States.

Technically, the investment maps onto two systems on IBM's roadmap. The first is IBM Quantum Starling, the 2029 machine, designed to run 100 million quantum operations on 200 qubits. The second is the longer-term IBM Quantum Blue Jay, which aims higher still—1 billion quantum operations on 2,000 qubits. A "fault-tolerant" machine can detect and correct errors on the fly, continuing to run accurately despite noise and faults—a capability regarded as the critical milestone separating experimental quantum computers from practically useful ones.

Delivering on that 2029 goal will hinge on progress in the lab and on the factory floor: error rates must fall sharply, and error correction, hardware yield, and manufacturing supply chains all need to mature over the next few years. That is precisely why IBM is directing the funding toward research, manufacturing scale-up, and ecosystem partnerships. For businesses and developers, the signal is clear—quantum computing is shifting from a research topic toward long-term infrastructure investment.

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DON'T SCARE THE CAT: HOW TO PEEKS AT A QUBIT WITHOUT SPOOKING IT

A team led by Professor Andrea Morello of UNSW Sydney, with PhD candidate Arjen Vaartjes as first author, has published an adaptive readout protocol aimed at improving the quantum non-demolition (QND) measurements on which quantum error correction relies.

This paper's advance is a measurement strategy. The qubit is an antimony-123 (^{123}Sb) nucleus implanted in isotopically enriched silicon: a spin-7/2 "qudit" with an eight-dimensional Hilbert space, which can encode information while leaving room for error detection. The nuclear spin is read out indirectly: a hyperfine-coupled electron serves as an ancilla, read through a single-electron transistor (SET) to infer the nuclear spin state.

The challenge is non-ideal QND: when the ancilla electron tunnels, it can flip the nuclear spin, so extra readout shots add information but also disturbance. By probing only the remaining "dark-state subspace" through negative results, the team kept the measurement genuinely QND—raising fidelity from 98.93% to 99.61% with a threefold speedup. The work shows that a smarter measurement strategy alone can push readout fidelity into the range needed for fault tolerance—suggesting that learning to read a qubit gently may matter as much as building a better one. Whether it scales from a single atom to many-qubit arrays will be the next test.

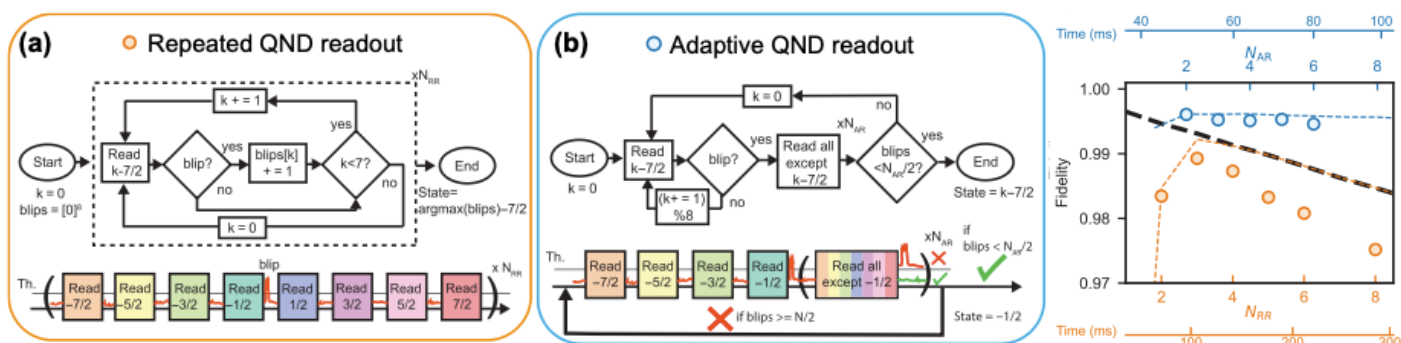


Fig. Adaptive QND readout (blue) reaches a higher readout fidelity than conventional repeated readout (orange), while cutting the readout time about threefold.

[READ MORE \(Paper Research Article & News\)](#)

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