

Infleqtion takes quantum gravity gradiometer into the field for mineral exploration

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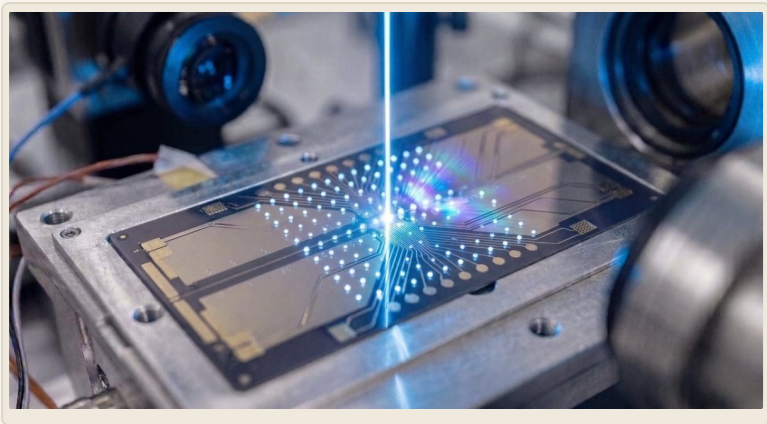
CURRENTSOTA

Physical qubits	1,180
2Q fidelity	99.99%
Logical qubits	96 LQ

[Quantum hardware SOTA table](#)
⇒

01 Other

Three Things Today

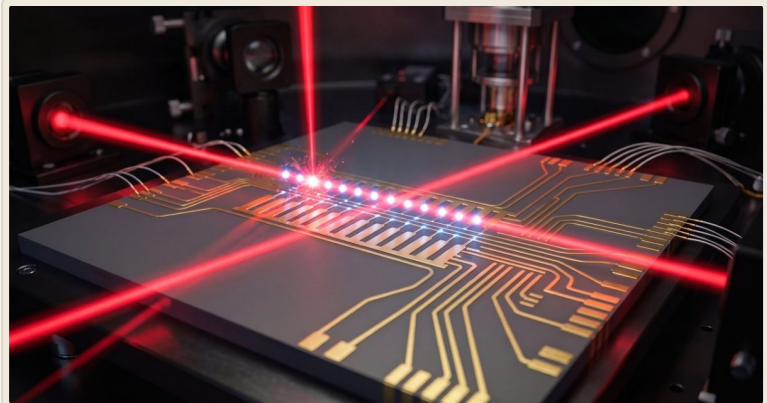


- 1 Infleqtion quantum gravity gradiometer** will undergo field testing in Colorado in 2027 for mineral exploration^{[1] [14]} —a planned field demonstration aimed at reducing drilling costs.
- 2 Infleqtion Q2 revenue of \$13.5 million**, up 157% year-over-year, an upward revision from the August 12 preliminary figure^[29] —the company says it remains on track to reach 30 logical qubits this year.
- 3 IonQ partners with CMC** to connect quantum cloud access to Canada's FABrIC quantum

computing sandbox^[8]—expanding academic and public-sector users.

02 Hardware

Hardware Frontier



Neutral Atoms

Inflektion announced it is advancing toward its goal of 30 logical qubits, expected to be achieved within the year^[29]. The target is a company claim; the source did not disclose error-correction code details or post-selection rates. Fault tolerance still requires further breakthroughs in cycle repetition rates and logical gate fidelity.

Photonics

A Chalmers team fabricated a microwave photon detector with a continuous detection efficiency of 0.47 and a bandwidth of 5 MHz^[18]. Technical implication: previously, microwave photon detectors required a trade-off between continuous

operation and high detection efficiency; this result raises continuous detection efficiency to nearly half, providing a practical component for quantum network nodes. Landscape impact: continuous operation and detection efficiency are no longer mutually exclusive, potentially providing a usable microwave single-photon detection component for modular quantum computing architectures.

Superconducting

Researchers observed a multi-mode quantum phase transition on a superconducting chip, with 21 resonant modes undergoing simultaneous frequency jumps^[21]. Technical implication: the phase transition manifests as synchronized frequency jumps across 21 modes, an experimental observation of multi-mode collective behavior. Landscape impact: provides an experimental platform for using superconducting circuits to simulate complex quantum many-body systems.

Spin Qubits

Quantum Motion established a U.S. operations center in the University of Maryland Discovery District, close to DARPA and other federal agencies^[12]. Technical implication: the new site is adjacent to U.S. federal research and defense agencies, aimed at supporting commercial expansion and strengthening defense

collaboration. Landscape impact: the silicon-based approach may accelerate industrialization under U.S. government funding.

Ion Traps

A TU Wien team, in collaboration with the University of Vienna, JKU Linz, and the University of Innsbruck, integrated an ion trap into an electron microscope, enabling coupling between an electron beam and a quantum computer^[26].

Technical implication: this new invention embeds quantum computing operations directly into microscopy imaging workflows, providing a new tool for nanoscale materials analysis. Landscape impact: may give rise to quantum-enhanced imaging and sensing applications.

03 Algorithms

Algorithms & Software



OTI Lumionics and Samsung Advanced Institute of Technology (SAIT) published a paper in JACS

claiming simulation of quantum computation with more than 200 logical qubits on a single server^[9].

Technical implication: their iQCC algorithm simulates equivalent quantum circuits classically for triplet-state calculations in materials; the result is a quantum-inspired algorithm, not an actual run on quantum hardware. Landscape impact: provides a near-term computational tool for materials discovery, but should be distinguished from genuine quantum computing capability.

NTT announced 28 papers accepted to CRYPTO 2026, covering post-quantum cryptography^[23].

Technical implication: covers quantum-safe tools for data, computation, and intelligent applications, showing the cryptography community accelerating its positioning. Landscape impact: provides candidate schemes for post-quantum cryptographic standards, influencing migration timelines in the financial and communications industries.

Researchers achieved reversal of quantum particle flow direction by modulating measurement frequency^[16]. Technical implication: first demonstration that quantum transport direction can be controlled solely by changing the measurement rate, without altering the system itself. Landscape impact: provides a new control degree of freedom for quantum device design.

Industry & Ecosystem



Company Updates

Infleqtion opened a new headquarters in Louisville, Colorado, and announced a 2027 field test of its quantum gravity gradiometer^{[1] [2] [14]}.

Technical implication: neutral-atom quantum sensing is moving from the lab to the field, with the goal of more precisely locating critical minerals before drilling. Landscape impact: if the test succeeds, it could reduce mineral exploration costs and promote quantum sensing applications in resource security.

Infleqtion announced participation in multiple investor conferences in fall 2026, with the CEO, CTO, and CFO attending^[3]. Business implication: raising capital-market visibility through investor relations activities, paving the way for future fundraising.

Symmetrics appointed Jim Garrity as Senior Vice President of Growth^[32]. Business implication: strengthening sales and business development, reflecting rising demand in the quantum security market.

BTQ Technologies appointed Michael Grace to support QCIM product development^[36]. Business implication: focusing on commercialization of post-quantum cryptographic products.

Funding & Policy

Quantinuum received \$1.5 million in total LEDA funding from the State of New Mexico and the City of Albuquerque to expand its R&D center^[15]. Business implication: local governments are using subsidies to attract quantum companies, driving employment and industrial clustering.

A bipartisan U.S. proposal introduced the Quantum-GUARD Act, targeting quantum cybersecurity risks to the power grid^[34]. Business implication: the bill aims to proactively enhance grid resilience; if passed, it will raise the power sector's attention to post-quantum security.

Singapore's SIT partnered with IBM to establish a quantum security center, to be operational by end of 2026^[28]. Business implication: enables enterprises and institutions to test quantum-safe technologies in real-world environments, accelerating PQC adoption.

The Israel Innovation Authority supported the formation of a post-quantum communications consortium, with Allot serving as chair ^[37].

Business implication: uniting 9 companies and 6 academic institutions to advance R&D in PQC, QKD, and hybrid solutions.

Partnerships & Ecosystem

IonQ signed a non-binding MOU with CMC Microsystems, designating IonQ as the official cloud quantum access provider for Canada's FAbRIC quantum computing sandbox ^[8]. Business implication: expanding the user base among Canadian universities and research institutions, opening a public-sector market for IonQ.

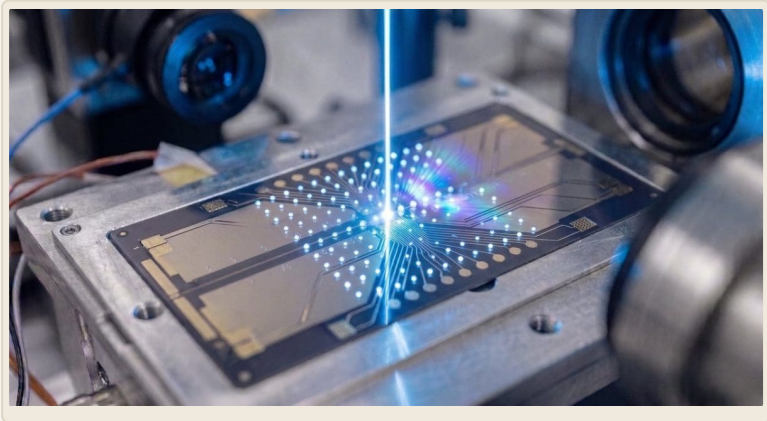
NTT DOCOMO deployed its second D-Wave production-grade quantum application, for optimizing mobile network signaling, reducing peak location-registration signaling by 65.3% ^[11]. Business implication: quantum annealing has achieved quantifiable benefits in telecom network optimization, strengthening D-Wave's commercial case.

SEALSQ partnered with Palm Technologies to provide post-quantum secure hardware for digital payments and public transit in India ^[38]. Business implication: integrating the QS7001 secure MCU into biometric products, targeting India's vast market.

Eclipses partnered with Sterling to deliver payload-level post-quantum encryption to U.S. federal agencies^[13]. Business implication: addressing the "harvest now, decrypt later" threat and accelerating cryptographic migration in federal systems.

05 Other

Academic Frontier



Researchers realized a one-sided supersolid state in a doped lattice^[30]. Technical implication: first realization of an asymmetric state with superfluid on one side and rigid order on the other in a doped system. Landscape impact: provides a new platform for studying quantum phase transitions and supersolid materials.

Scientists may have observed vacuum birefringence for the first time, originating from the strong magnetic field of a magnetar^[31]. Technical implication: if confirmed, it would be direct evidence of the quantum vacuum effect predicted

by Heisenberg. Landscape impact: opens a new window for cross-disciplinary research between quantum electrodynamics and astrophysics.

The relationship between network shape and qubit entanglement decay has been revealed ^[19].

Technical implication: vertex-base pairs preserve entanglement proportionally relative to a symmetric reference, while base-base pairs decay faster under noise. Landscape impact: provides theoretical guidance for quantum network topology design.

Researchers enhanced entangled-photon correlations in a Raman source by shortening the write pulse ^[17]. Technical implication: unified particle-number dynamics with signal propagation models, achieving quantitative control of photon-pair generation. Landscape impact: improves light-source quality for quantum communication.

An MCQST team fabricated a single-photon source using photonic crystal waveguides, filtering out spurious frequencies ^[27]. Technical implication: improves quantum communication efficiency. Landscape impact: provides a key component for integrated quantum photonics.

Argonne National Laboratory launched a \$1 million project to apply diamond quantum sensors to high-energy physics ^[20]. Technical implication: aims to map electromagnetic fields with higher

precision. Landscape impact: provides new diagnostic tools for particle accelerators.

06 Impact

Today's Impact

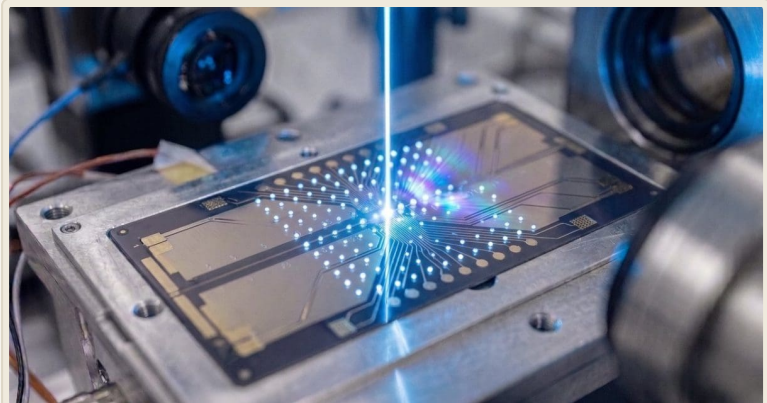


- **Mineral exploration industry:** If Infleqtion's quantum gravity gradiometer succeeds in its 2027 field test, it will provide a new data source for subsurface mineral distribution and may change exploration workflows and cost structures ^[1] ^[14].
- **Telecom operators:** NTT DOCOMO's quantum optimization application has achieved a 65.3% reduction in signaling; other operators may follow suit in adopting quantum annealing for network optimization problems ^[11].
- **U.S. federal agencies:** The Eclipses–Sterling partnership accelerates deployment of payload-level post-quantum encryption, addressing the "harvest now, decrypt later" threat ^[13].

- **Canadian research community:** IonQ's access to the FAbriC sandbox via CMC gives Canadian researchers more quantum computing resources ^[8].
- **India payments & transit:** SEALSQ's partnership with Palm Technologies provides post-quantum secure hardware for digital payments and public transit in India, potentially influencing local fintech security standards ^[38].

07 Other

Editorial Commentary



Quantum sensing is moving from the lab into real-world scenarios. Infleqtion's deployment of a quantum gravity gradiometer for field-based mineral exploration marks a shift in quantum technology beyond computing, toward solving macroscopic problems such as resource exploration. If the 2027 test succeeds, it will validate the reliability of quantum sensing in harsh

environments and may give rise to a quantum services market centered on mineral exploration.

Meanwhile, post-quantum cryptography deployment is accelerating. From the U.S. power-grid bill to the Israeli consortium to the Singapore test center, countries are preparing for the security threats that will emerge as quantum computing matures. This "build while fortifying" posture indicates that the commercialization paths of quantum technology are diverging: computing hardware remains in an early stage, while sensing and security have entered the eve of practical deployment.

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