

Quantum navigation begins sea trials — when GPS fails, ships won't lose their way.

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C U R R E N T S O T A

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

[Quantum hardware SOTA table](#)
⇒

01 Other

Three Things Today



- 1 IBM completes acquisition of HRL Laboratories** The transaction has officially closed, bringing silicon spin qubits, quantum sensing, and cryogenic technologies into IBM's multimodal quantum roadmap ^[20] — IBM is now betting on both superconducting and silicon spin approaches, accelerating route diversification.
- 2 D-Wave CFO to retire in September; cumulative funding exceeds \$900 million** John Markovich will retire on September 2, having raised over \$900 million in capital for D-Wave during his tenure ^[31] — the quantum

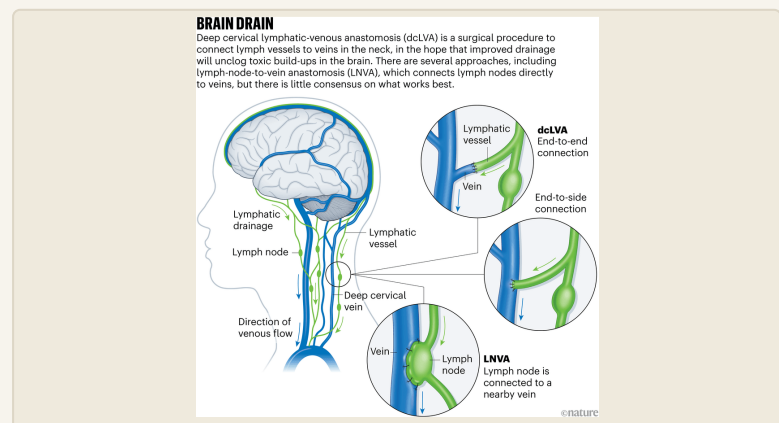
annealing sector is well-funded, and the management team is entering a transition period.

3 Xanadu and Mitsubishi Chemical use quantum algorithms to simulate EUV lithography

The two parties are collaborating to use quantum algorithms to simulate extreme ultraviolet lithography, a critical chip manufacturing process [28] — quantum computing is entering process simulation at the core of chip manufacturing, benefiting the semiconductor supply chain.

02 Hardware

Hardware Frontier



Quantum Navigation

Q-CTRL completes maritime trial of quantum gravity navigation under GPS-denied conditions

Q-CTRL announced it has demonstrated GPS-free quantum gravity navigation in a real maritime field trial, though specific accuracy and drift rate figures were not disclosed ^[58]. This marks the first validation of quantum gravimeter navigation capability in a real maritime environment, following the previously reported Ironstone Opal product. Relative to current SOTA: quantum gravity navigation has no publicly available commercial benchmark, and this trial constitutes engineering validation rather than a performance record. Practical deployment still lacks long-term drift suppression and repetition-rate data under dynamic maritime conditions. The impact on maritime navigation, submarines, and autonomous vessels is direct; if accuracy meets requirements, dependence on GPS could be reduced, with an expected timeline of 3–5 years.

Superconducting Quantum Computing

Origin Quantum demonstrates coherent quantum router on superconducting processor

A research team at Origin Quantum has demonstrated a coherent quantum router on a superconducting processor, a key component for implementing bucket-brigade quantum random access memory (QRAM) ^[36]. Coherent routing means quantum information can be transferred between multiple storage cells on demand without destroying coherence. This result represents a

mid-scale demonstration on the superconducting route, involving no qubit-count or fidelity records, but it fills a gap in QRAM hardware implementation. It has potential to advance quantum machine learning and large-scale data loading applications, but practical QRAM still requires integrated verification at larger scales.

Photonic Quantum Computing

Sparrow Quantum receives EuroHPC funding to advance photonic quantum project

Danish photonic quantum computing company Sparrow Quantum has been selected by the EuroHPC JU for the Quantum Grand Challenge program, receiving first-phase Coordination and Support Action (CSA) funding, with the specific amount undisclosed ^[57]. The funding is for establishing technical proof-of-concept and belongs to the pre-procurement stage of European quantum computing. Relative to SOTA: this announcement concerns only the funding stage, with no performance metrics disclosed, and Sparrow has not yet published comparable data such as fusion fidelity. It is positive for the European photonic quantum ecosystem, but deployment-grade systems still require end-to-end loss budgets and inter-chip interconnect verification.

Algorithms and Software



IBM releases Qiskit Fermions framework to simplify molecular simulation

IBM has launched Qiskit Fermions, an open-source framework for handling fermionic systems, providing a toolset for simulating molecules on quantum computers ^[34]. Fermionic systems are central to chemistry and materials simulation, and the framework standardizes the workflow of second quantization, mapping, and circuit construction. Technical implication: it lowers the barrier to quantum chemistry application development, sparing researchers from implementing fermion-to-qubit mappings from scratch. Ecosystem impact: it accelerates the deployment of quantum algorithms in the pharmaceutical and materials industries, but practical value depends on underlying hardware scale, expected to materialize gradually over 2–3 years as error correction advances.

Photonic publishes SHYPS QLDPC code research in Nature Communications

Photonic announced that its paper on SHYPS QLDPC codes has been published in Nature Communications, with simulations showing that the code uses approximately $1/3.5$ to $1/2$ of the physical qubits required by surface codes of comparable scale [66]. QLDPC (quantum low-density parity-check) codes are a key path to reducing physical qubit overhead in fault-tolerant quantum computing. Relative to SOTA: the source does not provide hardware-side logical qubit comparisons; SHYPS is currently simulation-only and has not been verified on hardware. If realized, it could substantially reduce the physical qubit count required for fault tolerance, with value for both photonic and superconducting routes, but experimental demonstration is still pending.

04 Industry

Industry and Ecosystem

Quantum eMotion's Quantum Entropy Source
Submitted for NIST Validation

August 26, 2026

quantum  motion.

Funding and Capital

IQM dual-lists on Nasdaq and Helsinki, raising over \$250 million

Finnish quantum computing company IQM has completed a dual listing, raising over \$250 million and becoming the third Finnish company to list simultaneously on Nasdaq and Helsinki ^[32]. This move breaks the trend of European deep-tech companies seeking funding in the United States. Business implication: it provides a successful case of domestic capital exit for European quantum hardware companies and may attract more European investors to the quantum sector. For IQM itself, the funds will be used for superconducting quantum processor R&D and market expansion, with capacity expansion visible within 1–2 years.

Diraq establishes U.S. engineering center in Santa Monica to accelerate silicon spin qubit route

Diraq has officially opened a U.S. technology center in Santa Monica, California, with an initial team of 20 focused on integrated circuit design, cryogenic CMOS architecture, device modeling, and machine learning, with plans to double headcount within 12 months ^[21]. Technical implication: silicon spin qubits are compatible with standard CMOS processes and represent one of the most scalable routes, though the source does

not disclose Diraq's current qubit count and fidelity metrics. Ecosystem impact: this move strengthens Diraq's U.S. R&D and supply chain presence, directly competing with IBM's silicon spin team following the HRL acquisition; the next 12–24 months will be a critical period for route competition.

Finnish Defense Technology Center expands quantum and dual-use technology ecosystem

The Finnish Defense Technology Center announced the expansion of its quantum and dual-use technology ecosystem, with specific investment amounts undisclosed ^[61]. Finland is home to quantum hardware and cryogenic equipment companies such as IQM and Bluefors, and defense demand can accelerate technology transfer. Business implication: quantum sensing and secure communication are defense necessities, and Finland's move may generate more government orders and military-civil fusion projects. It is positive for the European quantum security supply chain, but specific procurement scale remains to be seen.

Policy and Standards

China's Central Cyberspace Affairs Commission releases 2026–2030 action plan, listing quantum technology as a frontier technology

China's Central Cyberspace Affairs Commission has released a 2026–2030 action plan, listing quantum technology as one of the frontier technologies for cyberspace enterprises, proposing to enhance competitiveness, innovation capability, and industrial ecosystem development, but without specific quantum-focused measures [65]. Technical implication: the policy signal is clear, but quantitative targets are lacking. Ecosystem impact: China's quantum industry will receive policy support, but the specific level of support depends on subsequent funding and projects, with a five-year timeline.

EuroHPC JU selects 13 European QPU startups for Quantum Grand Challenge

The EuroHPC Joint Undertaking approved Decision No. 31/2026, selecting 13 European quantum computing startups from the HORIZON-JU-EUROHPC-2026-QGC-02 call for proposals, providing first-phase Coordination and Support Action funding [22]. These companies will establish technical proof-of-concept, paving the way for subsequent procurement and deployment. Business implication: Europe is cultivating a domestic quantum computing supply chain through public procurement, echoing the U.S. NSF's \$290 million investment. It is an important endorsement for the selected companies, but first-phase funding is typically small; attention

should be paid to the scale of subsequent deployment contracts.

Italian Council of State rejects Campania Region appeal, reopening €61.2 million quantum computer tender

The Fifth Section of the Italian Council of State has rejected the appeal by the Campania Region and IBM Italia, upholding the lower administrative court's annulment of the €61.2 million quantum computer tender originally planned for deployment at the University of Salerno campus ^[23]. Technical implication: public procurement procedural compliance has become a key obstacle to quantum project deployment. Ecosystem impact: IBM's expansion in European public quantum projects is hindered, other suppliers may gain re-bidding opportunities, and the project timeline is delayed by at least 6–12 months.

Partnerships and M&A

IBM completes acquisition of HRL Laboratories

IBM has officially completed its acquisition of HRL Laboratories, gaining silicon spin qubit, quantum sensing, cryogenic, and advanced materials expertise, forming a dual-track hardware layout alongside IBM's existing superconducting qubit route ^[20]. Technical implication: silicon spin qubits are compatible with CMOS processes and are an important long-term scaling candidate, but

current fidelity and qubit counts lag behind superconducting and ion-trap approaches. Ecosystem impact: IBM becomes a giant with both superconducting and silicon spin routes, exerting competitive pressure on silicon spin startups such as Diraq and Quantum Motion, with consolidation effects potentially visible within 2–3 years.

Xanadu and Mitsubishi Chemical collaborate on quantum algorithm simulation of EUV lithography

Xanadu and Mitsubishi Chemical are collaborating to use quantum computing algorithms to simulate extreme ultraviolet (EUV) lithography processes, a critical step in chip manufacturing ^[28]. Technical implication: EUV lithography involves complex photochemistry and material interactions with enormous classical simulation costs, and quantum algorithms may offer acceleration. Ecosystem impact: if validated, it could shorten chip process development cycles, with potential value for semiconductor equipment manufacturers such as ASML and downstream chipmakers, but it remains early-stage exploration, at least 5 years from industrial application.



Non-Gaussian noise magnetometry using localized spin qubits

A paper published in the journal *Quantum* uses atomic-scale spin qubits such as diamond nitrogen-vacancy (NV) centers to study non-Gaussian magnetic field noise, achieving nanoscale spatial resolution ^[41]. Technical implication: non-Gaussian noise is ubiquitous in solid-state quantum systems, and this work provides a new tool for noise spectroscopy. Ecosystem impact: it has fundamental research value for decoherence control in quantum sensing and quantum computing, with no direct commercial impact in the short term.

Bayesian estimation achieves optimal precision scaling for non-Markovian parameters

Researchers have demonstrated that Bayesian estimation combined with reaction-coordinate mapping can achieve optimal precision scaling for parameter identification in non-Markovian

quantum systems under continuous monitoring, surpassing the traditional Markovian limit ^[30].

Technical implication: it provides a theoretically optimal approach for parameter estimation in open quantum systems. Ecosystem impact: it has guiding significance for noise suppression in quantum metrology and quantum sensing, but experimental verification remains some distance away.

Quantum networks can optimize connections without complete noise maps

A self-configuring approach combines superimposed quantum paths with variational quantum optimization, enabling quantum networks to dynamically optimize noisy paths and establish high-fidelity connections without detailed characterization of quantum channels ^[37].

Technical implication: it reduces the complexity of quantum network deployment, avoiding the need for complete noise tomography of every channel. Ecosystem impact: it advances the practical deployment of quantum communication networks, but validation in real fiber environments is still needed.

University of Bristol builds dynamic entanglement network connecting six users

Researchers at the University of Bristol have demonstrated a metropolitan-scale entangled quantum communication network, dynamically

distributing polarization-entangled photon pairs to six users over deployed campus and metropolitan fiber [40]. Technical implication: multi-user dynamic entanglement distribution is a key step toward quantum network scalability. Ecosystem impact: it provides an experimental foundation for quantum key distribution networks and distributed quantum computing, but commercial deployment still requires improvements in entanglement rates and stability.

Quantum channels violate entropy additivity

The University of Waterloo has proven that the minimum output p-Rényi entropy of quantum channels violates additivity for all $p > 3/4$ and $0 \leq p < 1/4$ [38]. Technical implication: it resolves a long-standing open problem in quantum information theory, affecting channel capacity calculations. Ecosystem impact: it has theoretical significance for quantum communication protocol design, with no direct application in the short term.

"Magic Scroll" technique triples magic state preparation volume

A technique called Magic Scroll enhances magic state preparation capability, tripling the cultivation volume with error rates as low as 10^{-9} , using color codes and bilayer codes in a register-based quantum architecture [29]. Technical implication: magic states are a critical resource for

implementing non-Clifford gates in fault-tolerant quantum computing, and this technique substantially reduces magic state preparation overhead. Ecosystem impact: if verified on hardware, it could accelerate the practical deployment of fault-tolerant quantum computing, but it is currently only a theoretical or simulation result.

06 Impact

Today's Impact



- 1 Quantum navigation enters maritime field-testing phase:** Q-CTRL's maritime trial ^[58] means quantum navigation under GPS-denied conditions is no longer just a laboratory demonstration. The maritime, submarine, and autonomous vessel industries should begin evaluating the feasibility of quantum gravimeters as backup navigation, with attention next on accuracy and drift rate data.

2 IBM's quantum route diversification: With the completion of the HRL acquisition ^[20], IBM now holds both superconducting and silicon spin qubit routes, which may accelerate the industrialization of the silicon spin approach. Startups such as Diraq face greater competitive pressure, and investors need to reassess the silicon spin sector landscape.

3 European quantum public procurement accelerates: EuroHPC's selection of 13 startups ^[22] and the reopening of the Italian tender ^[23] show that Europe is cultivating its quantum supply chain through government procurement, but procedural compliance issues may delay deployment. Relevant companies should monitor subsequent contract terms and timelines.

4 Quantum security ecosystem continues to expand: CypherGenics' launch of the FASTKAT platform ^[17], Quantum eMotion's NIST validation submission ^[19], and Atsign's SDK update ^[63] all indicate accelerating PQC productization. Enterprise customers should begin evaluating migration paths and monitor NIST standard finalization timelines.

5 Quantum computing enters chip manufacturing: If the Xanadu–Mitsubishi Chemical collaboration on EUV lithography simulation ^[28] succeeds, it could shorten chip process development cycles. Semiconductor

equipment and materials companies should track progress in quantum algorithms for lithography simulation.

07 Other

Editor's Commentary



Today's news reveals two trends. First, quantum technology is migrating from the laboratory to real-world environments: Q-CTRL's maritime navigation trial, the University of Bristol's metropolitan entanglement network, and Origin Quantum's coherent router are all validating the engineering feasibility of quantum systems under complex conditions. These "out-of-the-lab" attempts reflect industrialization progress more meaningfully than raw qubit counts or fidelity records. Second, industrial consolidation and public procurement are proceeding in parallel: IBM's acquisition of HRL, EuroHPC's selection of 13 startups, and the reopening of the Italian tender all indicate that quantum computing is shifting

from a technology race to supply chain and ecosystem building, with government funding serving as a major driver — but compliance and execution efficiency will become bottlenecks. Over the next 6–12 months, attention should focus on the repeatability and reliability data from these engineering validations, rather than peak performance from single demonstrations.

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