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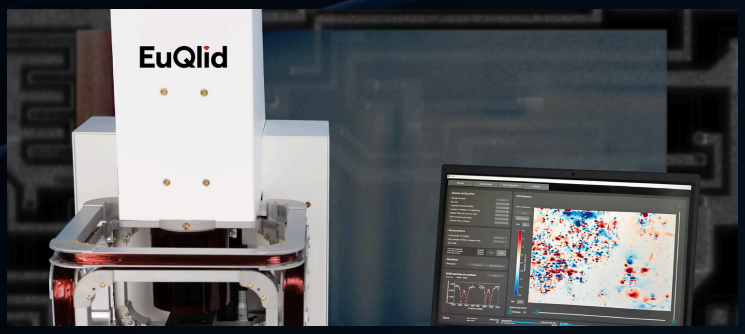
Q-Newsletter

HIGHLIGHT

Quantum Sensors Target 3D Semiconductor Defects



The startup EuQlid has developed its "Qu-MRI" platform, a quantum sensor system built from artificial diamonds, to detect hidden faults deep inside 3-D chip stacks without the damage associated with traditional inspection methods. As advanced semiconductor designs layer multiple transistor-rich wafers, defects in vertical interconnects or silicon cracks can compromise entire stacks. EuQlid claims its sensor can non-invasively inspect down to depths of 100-150 μm and operates around 100 times faster than X-ray methods. By mapping minute current flows via nitrogen-vacancy-center diamond magnetometry, the technology positions quantum sensing as a manufacturer's tool, moving quantum from lab curiosity toward industrial deployment.

RESEARCH

Millisecond Coherence Times

On the November 5th, a team at Princeton University reported the development of a new superconducting transmon qubit with a coherence time exceeding one millisecond — roughly three times longer than previous records. The researchers achieved this by fabricating the qubit from tantalum on a silicon substrate, a material combination that dramatically suppresses energy loss mechanisms that normally limit qubit lifetime. By reducing surface defects and improving interface quality, the team created a device capable of maintaining a stable quantum state for an unprecedented duration in a solid-state platform. This enables far more operations to be performed before decoherence sets in, which is essential for executing long quantum algorithms.

This is a big deal for scalable quantum computing. Longer coherence times mean quantum information stays intact for far longer, making error correction more practical and pushing systems toward real-world utility. Princeton's design is compatible with existing superconducting architectures (such as those used by Google and IBM), potentially enabling significant improvements in fault tolerance.

MARKET

Quantum Real Estate

JLL, a firm that specialises in real estate and investment management, warns that a "quantum land grab" is approaching as quantum computing moves into commercial infrastructure. Quantum systems require ultra-specialized facilities (with cryogenic cooling, electromagnetic shielding, and vibration-free environments) creating real-estate demands far beyond today's data centers.

JLL projects commercial quantum deployment by 2030, with hybrid data centers housing both classical and quantum machines, and investment rising from $2 billion today to as much as $50 billion after a major breakthrough. This shift is expected to concentrate development around existing research hubs across the globe, accelerating the rise of "quantum campuses" and Quantum-as-a-Service infrastructure. Quantum hardware will need a physical home, and the race to secure that footprint has already begun.

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