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Quantum Memories, Processors and Transducers

Exploring the world's Highest Coherence SRF cavity based novel architectures

- Universal qudit operations using multimode cavity
- High-fidelity qubit entangling operation
- High-efficiency microwave-optical quantum transducer

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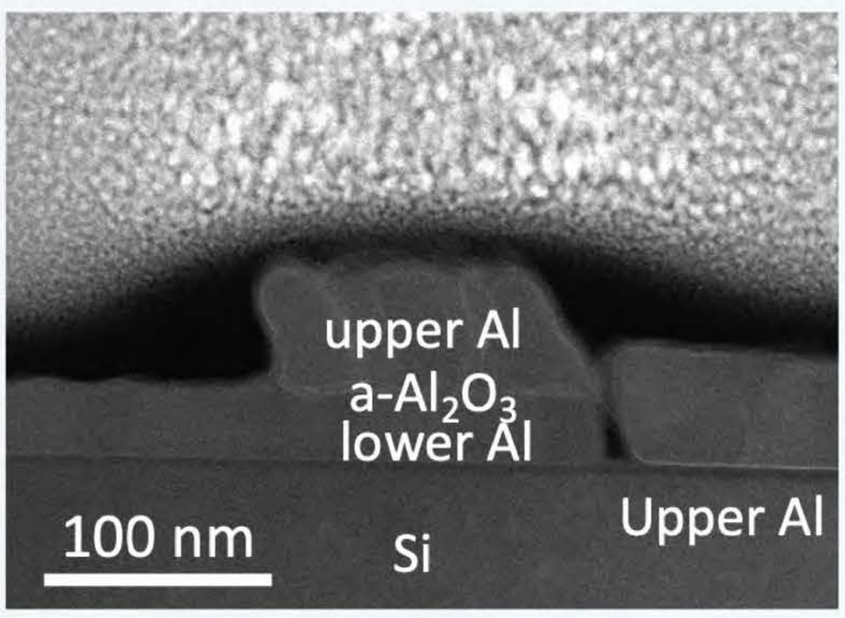
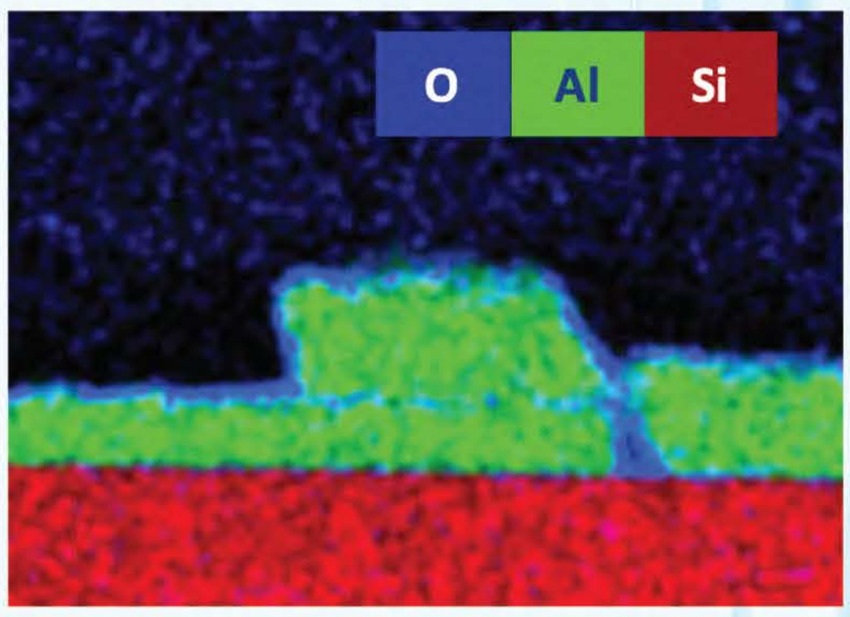
Materials for Quantum Technologies

Understanding and mitigating sources of quantum decoherence

- Investigating sources of information loss with advanced characterization tools
- Measuring the impact materials have on performance with parts per billion precision
- Disentangling sources of performance variations through coordinated Round-Robin study





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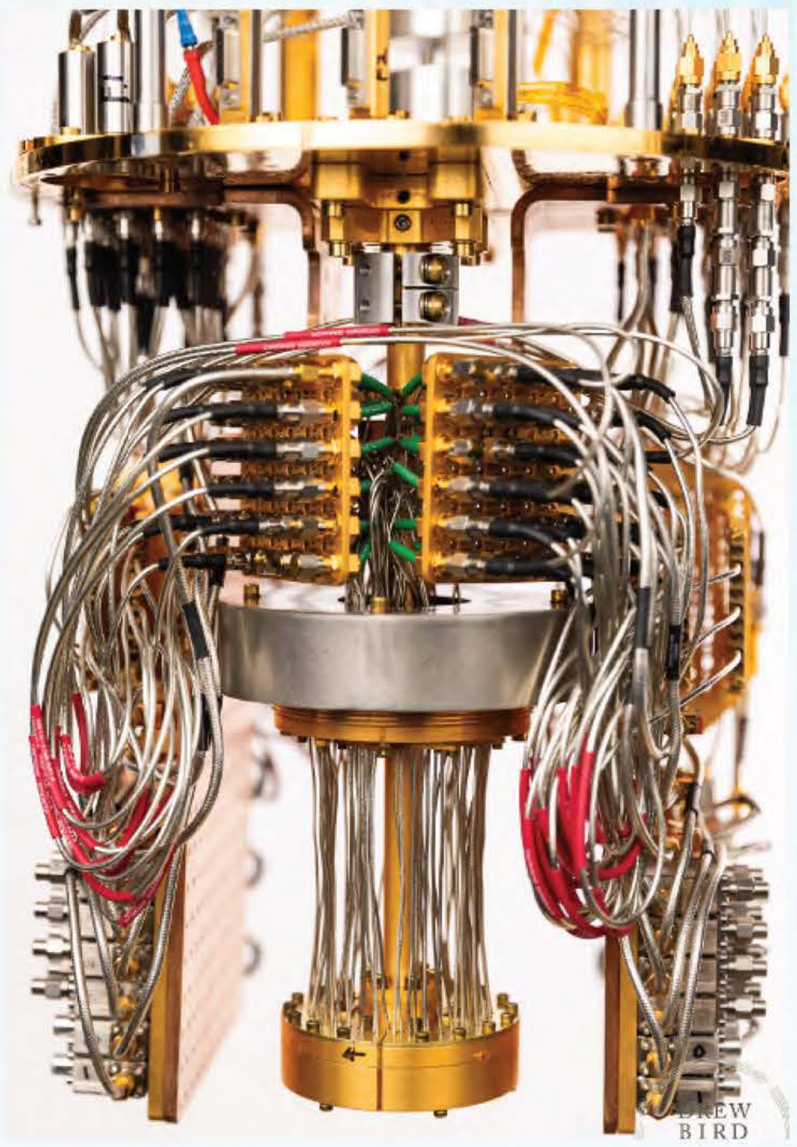
Quantum Computing Platforms

Advancing commercial superconducting qubit technology and applications

- Incorporating material advances to achieve processors with higher gate fidelities
- Simulating particle and condensed matter physics problems
- Algorithms for financial modeling and medical data analysis



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Quantum Sensors for Physics

Performing fundamental studies with unprecedented sensitivity and precision

- Applying quantum technologies to search for dark matter and new particles
- Precision tests of the Standard Model
- Expanding the frequency for gravitational wave detection beyond LIGO & Virgo

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Ecosystem and Workforce Development

Providing access to unique infrastructure and develop a quantum-ready workforce

- Training through research
- Providing industry access to facilities to test early prototypes
- Partner with minority serving institutions to grow and develop a diverse quantum workforce

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National Qubit Nanofabrication Taskforce

Bringing transformational advances to qubit coherence across national foundries

- Ensure quality control and maintain reproducibility of results across foundries
- Leverage standardized device geometry to understand effect of materials and interfaces
- Guided by materials studies, newly developed innovative fab techniques have brought systematic improvements in performance of transmon qubits