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## **“Overview of the Superconducting Quantum Materials and Systems Center”**

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**SQMS - Fermilab**

The Superconducting Quantum Materials and Systems Center, led by Fermi National Accelerator Laboratory, is one of five research centers funded by the U.S. Department of Energy as part of a national initiative to develop and deploy the world’s most powerful quantum computers and sensors. SQMS brings together more than 400 experts from approximately 30 partner institutions (including national laboratories, academia and industry) in multidisciplinary collaboration that integrates quantum information science, material science, applied and theoretical superconductivity, computational science, particle and condensed matter physics, cryogenics, microwave engineering.

The SQMS Center uses world-record quality-factor superconducting radio-frequency, or SRF, cavities as ultra-sensitive quantum probes. Cavities combined with superconducting transmon qubits can be the building block of a quantum computer, enabling to store and manipulate quantum information. Additionally, cavities can also be employed for fundamental physics searches. Within the quantum sensing thrust, researchers are developing experiments based on cavities and novel quantum devices to search for particles beyond the Standard Model, dark matter candidates, gravitational waves and fundamental material properties.

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