QUANTUM SCIENCE CENTER SM

A U.S. Department of Energy
National Quantum Information Science
Research Center

OUR MISSION

The Quantum Science Center (QSC), headquartered at Oak Ridge National Laboratory, is building the nation's first ecosystem for hybrid quantum high-performance computing (QHPC). By uniting national laboratories, academic institutions, and industry partners, QSC is developing a holistic software ecosystem that integrates algorithms, applications and experimental validation to amplify the impact of fault-tolerant quantum computing. These efforts will help to position the United States at the forefront of quantum-accelerated computing, benefiting science and technology globally.

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U.S. DEPARTMENT of ENERGY

FOCUS AREAS

INNOVATE

Develop QHPC algorithms and applications for material science discovery

BUILD

Integrate and scale first-of-a-kind QHPC systems and software with industry partners

DEMONSTRATE

Match cutting-edge simulations with cutting-edge experiments on fabricated materials

Software Ecosystem

Develops openQSE as an adaptive, end-to-end software ecosystem for QHPC systems and applications

Hybrid Algorithms

Designs workflows for the QHPC ecosystem that target quantum simulation of model materials

Scientific Applications

Develops and validates simulation codes for quantum materials by implementing hybrid workflows on QHPC systems

QHPC Architectures

Co-designs and evaluates approaches for executing applications on hybrid computing systems

Experimental Validation

Develops quantum spin systems to validate QHPC simulations

Ecosystem Engagement

Fosters and facilitates outreach opportunities for the current and future QHPC workforce