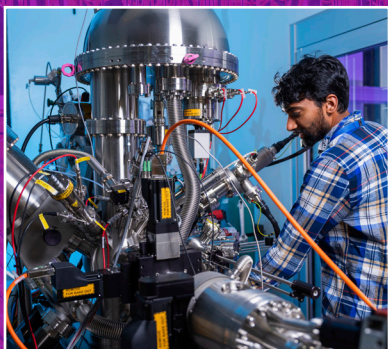
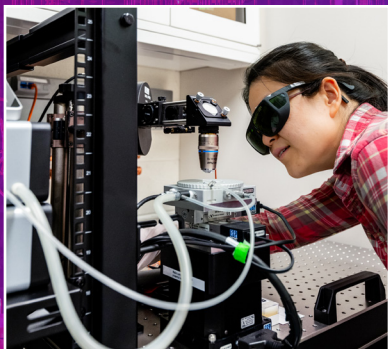
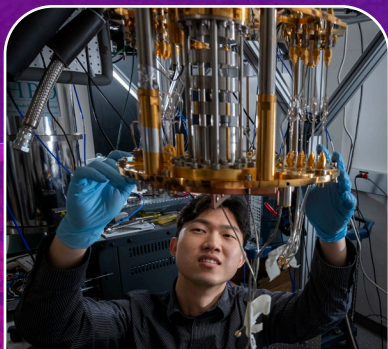


Delivering Breakthroughs for Future Technologies

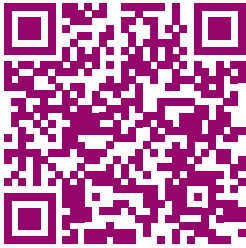
The National Quantum Information Science Research Centers (NQISRCs) are tackling some of the most complex challenges in quantum science. Each center brings a distinct scientific mission, but together they form a powerful, complementary research enterprise. Led by U.S. Department of Energy National Laboratories, the NQISRCs unite expertise, infrastructure and science resources from across the nation to achieve breakthroughs and accelerate quantum technologies toward practical applications. Working at center-scale makes possible what no single institution could accomplish alone — strengthening the nation's quantum ecosystem and keeping the United States at the forefront of the rapidly evolving quantum frontier.

CENTER	LEAD LAB	MISSION
 C2QA Co-design Center for Quantum Advantage	 Brookhaven National Laboratory	Deliver essential breakthroughs in materials science and modular system architectures to enable scalable, fault-tolerant quantum computing and quantum-limited sensing
 Q-NEXT NEXT GENERATION QUANTUM SCIENCE AND ENGINEERING	 Argonne NATIONAL LABORATORY	Leverage distributed entanglement to demonstrate the breakthrough potential for scalable quantum-technology platforms
 QUANTUM SYSTEMS ACCELERATOR Catalyzing the Quantum Ecosystem	 BERKELEY LAB	Co-design the high-fidelity quantum devices, algorithms and engineering solutions needed to deliver certified quantum advantage in scientific applications
 QUANTUM SCIENCE CENTER	 OAK RIDGE National Laboratory	Build the nation's first ecosystem for hybrid quantum high-performance computing
 SQMS SUPERCONDUCTING QUANTUM MATERIALS & SYSTEMS CENTER	 Fermilab	Develop beyond state-of-the-art quantum systems for computing, sensing, and communication based on superconducting microwave cavities and large-scale cryogenics





SCIENCE GOALS

C2QA	QSC	SQMS
• Deliver a tenfold increase in superconducting qubit lifetime over today's state of the art • Develop modular quantum system architectures, including hardware, interconnecting structures, quantum algorithms and error-correction strategies • Establish a reliable model for estimating the number of qubits needed to run meaningful algorithms on modular architectures	• Develop quantum high-performance computing (QHPC) algorithms and applications for material science discovery • Integrate and scale first-of-a-kind QHPC systems and software with industry partners • Match cutting-edge quantum simulations with cutting-edge experiments on fabricated materials	• Support and enable progressive hardware parameter improvements for the SQMS cavity-based quantum systems, for interconnects, communications and sensing systems • Develop the 100+ qubit SRF cavity-based quantum processing unit • Deploy the cryogenic and microwave building blocks of a scalable quantum internet
Q-NEXT	QSA	Recent NQISRC Achievements  NQISRC.org
• Advance the science needed to share entangled states of matter over distances • Demonstrate that entanglement can be used for breakthrough technologies in information processing, surpassing the performance of today's most advanced systems • Build entanglement-enhanced technologies, such as interconnected sensors and next-generation prototypes for communication	• Co-design programmable high-fidelity quantum computers and sensors that surpass today's state of the art for scientific discovery • Achieve 1,000× practical quantum performance by 2030 across scientific applications and atomic, ionic and superconducting platforms • Develop control software, modular architectures and error correction to make QSA systems scalable	

