

Quantum Information Science, Engineering and Technology

University of Colorado Boulder

The future of quantum is here. Quantum science is opening new frontiers of possibility in fields as diverse as aerospace, health, climate and computing. CU Boulder is at the leading edge of unlocking this potential.

As a catalyst for Colorado's prolific quantum community, CU Boulder has been driving quantum innovation for decades thanks to a comprehensive research environment that accelerates fundamental advances, develops engineering and technical expertise, and engages state and national leaders to cultivate a next-generation economy and workforce equipped to turn groundbreaking lab discoveries into real-world impact.

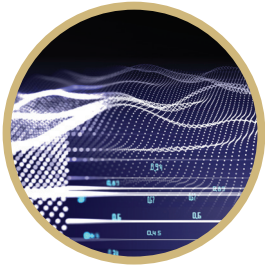
CUbit

QUANTUM INITIATIVE

The **CUbit Quantum Initiative** is an interdisciplinary hub that works to **convene, coordinate** and **catalyze** quantum activities at CU Boulder.

colorado.edu/cubit

Scientific Focus Areas



Quantum Sensing and Measurement



Quantum Networks and Communications



Quantum Computing and Simulation



Quantum Materials and Dynamics

Research & Technological Disciplines



Atomic clocks and precision atomic & molecular sensors



Frequency combs & optical metrology



Atomic & ion-based quantum bits & technology



Integrated photonics for quantum devices



Superconducting quantum bits



Aerospace engineering design & mission deployment

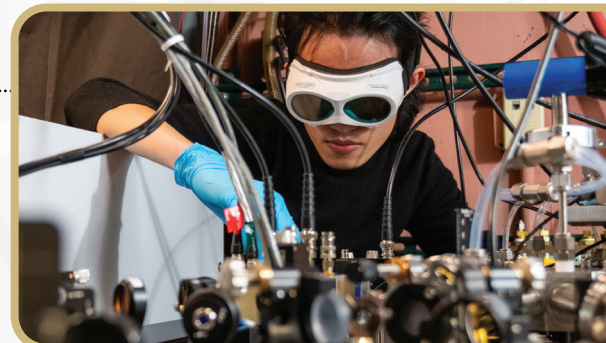


Radio frequency detection & control

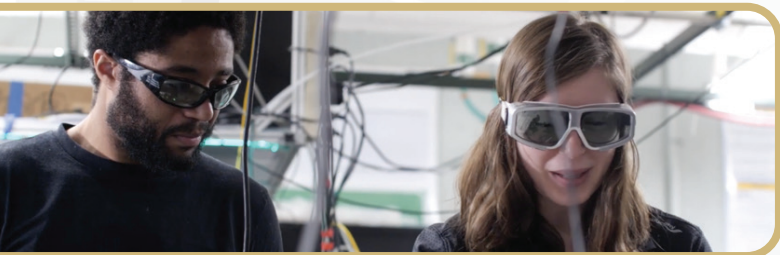
Industry Engagement

The **CUbit Quantum Initiative** at CU Boulder partners with industry to:

- ✓ catalyze advancement of quantum information technologies
- ✓ strengthen the regional and national quantum ecosystem
- ✓ build upon world-class research and education to develop the next generation of quantum solutions

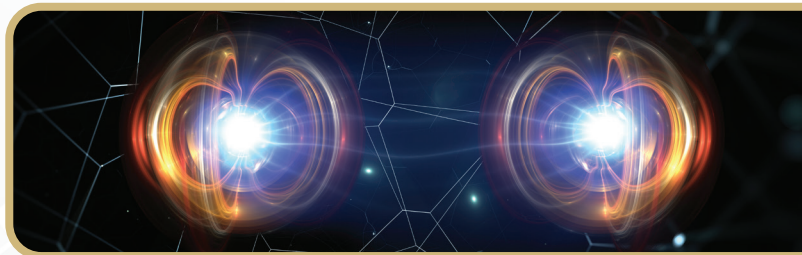


Quantum Science and Technology Centers



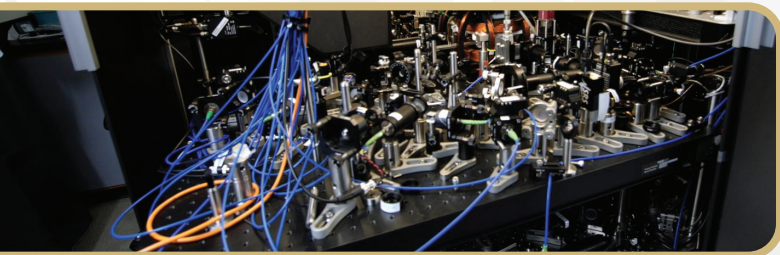
Quantum Systems through Entangled Science and Engineering (Q-SEnSE)

An NSF Quantum Leap Challenge Institute where collaborators explore how to advance quantum sensing.



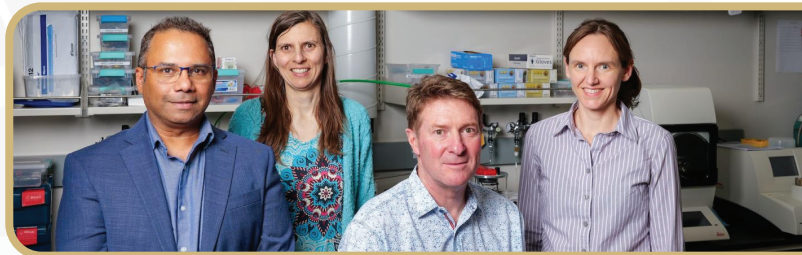
Quantum Systems Accelerator (QSA)

A DOE-funded multiorganization initiative established to design and deliver scalable quantum computers within five years.



Quantum Engineering Initiative (QEI)

A growing center in which faculty from the College of Engineering & Applied Science and scientific staff from NIST Boulder Labs operate a lab cluster at CU Boulder.




National Quantum Nanofab (NQN)


An open-access facility for the co-design and development of atomic-photonic devices for quantum computers, networks, atomic clocks and advanced sensors.


Education and Workforce Training

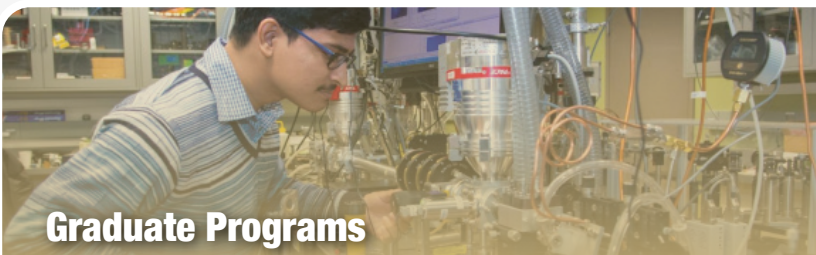
Undergraduate Programs

- ✓ **BA in Physics** (fourth largest program in the nation)
- ✓ **BS in Engineering Physics**
- ✓ **Minor in Quantum Engineering**

 **Quantum Forge:** A hands-on student training experience providing a novel laboratory space for multidisciplinary teams of undergraduate and master's students from engineering and physics.


 **Quantum Scholars:** Provides a fellowship and opportunities to help students learn about the quantum field, including connecting students with local companies and quantum technology.

 **Quantum Research Exchange (QRX):** An internship program geared toward students at two-year colleges, minority-serving institutions, and other academic organizations serving students typically underrepresented in STEM.



Graduate Programs

- ✓ **JILA:** Graduate Studies, Postdoctoral Researchers, Visiting Fellows
- ✓ **Quantum Engineering Initiative:** Graduate Studies, Postdoctoral Researchers
- ✓ **PhDs in Physics** (largest program in the nation), **Electrical, Computer & Energy Engineering;** **Mechanical Engineering;** and **Aerospace Engineering**
- ✓ **MS in Physics**

 **JILA:** A joint institute of CU Boulder and NIST, founded in 1962 and home to four Nobel prizes in Physics