

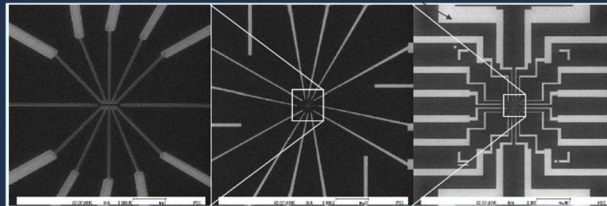


WHY BECOME A QUANTUM ENGINEERING TRAINEE?

- Perform interdisciplinary research at a top-rated engineering school
- Work with award-winning and innovative faculty who are dedicated mentors
- Be part of a select group of talented graduate students in an inclusive and supportive environment
- Complete a QISE portfolio program
- Personalize your career development and post-graduation goals
- Gain real-world experience by participating in an internship
- Be part of a program that fosters cross-pollination for innovative ideas and solutions

"Quantum technologies are poised to revolutionize how we compute, communicate, and sense, and this requires engineers who have an interdisciplinary education."

Peter Aaen
Department Head and Professor of
Electrical Engineering



NIST



SJSU SAN JOSÉ STATE
UNIVERSITY

CONTACT US

quantum@mines.edu

TO LEARN MORE AND APPLY, VISIT

www.mines.edu/qef

QUANTUM ENGINEERING FELLOWSHIP

A National Science Foundation Research Traineeship (NRT) in Quantum Information Science and Engineering (QISE)



MINES.EDU/QEF

PROGRAM

CORE COURSES

- Fundamentals of Quantum Information PHGN519
- Quantum Many-Body Physics PHGN545
- Microelectronics Processing Lab PHGN435 or Advanced Quantum Technologies Lab or Quantum Programming CSCI581
- Advanced Scientific Communication HASS423
- Introduction to Research Ethics SYGN502
- Quantum Engineering Graduate Seminar PHGN598a (for credit or audit)

ELECTIVES

Comprehensive Quantum Engineering electives list available at quantum.mines.edu/program

CULMINATING EXPERIENCE

Research and Thesis (9 credits)

PROGRAM SUMMARY

- MS Thesis
 - 30 credits
 - 9 research credits
- PhD (Quantum Engineering minor)
 - 72 credits
 - ~40 research credits (department dependent)
 - ~12-24 elective course credits (department dependent of which 12 must be from the core courses listed above)

One of the goals of the Quantum Engineering NRT is to support diversity among researchers in quantum engineering. We welcome all interested students into the traineeship and particularly encourage women, underrepresented minorities, veterans, and those with disabilities.

QUANTUM ENGINEERING FELLOWSHIP

This program is focused on training a Quantum Information Science and Engineering (QISE) workforce via a rigorous, interdisciplinary, integrated program to prepare graduate students for careers in QISE in industry, national labs, government, and academia.

The National Science Foundation (NSF) Research Traineeship program at Colorado School of Mines prepares students from diverse backgrounds to become future leaders in the QISE workforce, address the largest quantum challenges, and fill knowledge gaps in this research area.

Our research efforts will address three grand quantum challenges.

1. How can we achieve demonstrable quantum speed-up with near-term quantum resources?
2. How can materials and electrical engineering interface with quantum technologies to take us beyond the 2011 Materials Genome Initiative and other largescale materials research efforts?
3. How can new directions in quantum algorithms running on quantum and classical computers push forward and challenge the notion of quantum supremacy?

Our program to train a quantum workforce to meet these challenges contains:

- A complete curriculum to enable all STEM students to come up to speed in fundamental topics in quantum computing, simulation, and sensing to prepare them for transformative careers in QISE.
- A research traineeship program in collaboration with National Labs (NREL, NIST and LLNL) and industrial partners (Google and IBM), including cutting-edge research and direct access to new quantum platforms such as the LLNL Qudit testbed.
- Professional skill development via integration of courses in the program core and workshops on relevant topics such as teamwork and communication.

LEADERSHIP TEAM + AFFILIATES

COLORADO SCHOOL OF MINES

- Lincoln Carr, PI, Physics
- Peter Aaen, Co-PI, Electrical Engineering
- Geoff Brennecka, Co-PI, Metallurgical & Materials Engineering
- Zhexuan Gong, Co-PI, Physics
- Meenakshi Singh, Co-PI, Physics
- Bo Wu, Co-PI, Computer Science

SAN JOSE STATE UNIVERSITY

- Hilary Hurst, PI, Physics
- Ehsan Khatami, Co-PI, Physics
- Hiu Yung Wong, Co-PI, Electrical Engineering

NATIONAL LABS

- Justin Johnson, NREL
- Raymond Simmonds, NIST
- Yaniv Rosen, LLNL

STIPEND & ELIGIBILITY INFO

One-year competitive fellowships that provide funding (tuition, fees, medical insurance, and \$36K stipend) are available to qualified domestic (U.S. citizens, nationals, and permanent residents) students.

- Applicant must be a U.S. citizen, national, or permanent resident to be stipend-supported.
- Applicant must be currently enrolled in a graduate program at Mines.
- Applicant must intend to work on a collaborative research project (defined as having 2 or more PIs).
- The research project must be in quantum information or adjacent area.
- Applicant must have a GPA of at least 3.0, based on a 4.0 GPA scale.