

Job Description

Job Title:	Technical Lead, Quantum Early Adopters
Department:	CFREF - Transformative Quantum Technologies (TQT) 8611
Reports To:	Principal Investigator, TQT and Program Director, TQT
Jobs Reporting:	Early adopter teams (scientists, engineers and staff)
Salary Grade:	USG 13
Effective Date:	September 2018

Primary Purpose

This position will enable TQT and their partners to advance their enterprise based upon quantum technology and with TQT staff and infrastructure. The candidate will be responsible for the efficient running of the early adopter teams and meeting device targets as directed by Prof. David Cory. The successful candidate will work closely with staff and students to connect them to early adopter opportunities, and will lead engagement between early adopters, their applications and TQT as directed by the Program Director, TQT. This is a unique role that takes a broad spectrum of science and engineering and moves it towards impactful applications.

Key Accountabilities

Technical Lead Quantum Early Adopters

- In concert with the Program Director, TQT, lead engagements with potential early adopters around quantum opportunities.
- Bring scientific insight into exploratory discussions with prospective early adopters, identifying and communicating opportunities for quantum technology in a manner that is accurate, yet accessible to an audience not familiar with quantum science.
- Develop the science and engineering behind quantum sensing opportunities.
- Report and publish findings that advance quantum sensing opportunities.
- Patent new processes that advance quantum sensing opportunities.
- Lead TQT early adopter teams around quantum opportunities.
- Develop SOP's for successful quantum sensing.
- Develop and maintain research infrastructure that supports quantum sensing.

Early Adopter Projects

- Manage a group of TQT early adopter scientists and engineers so that their quantum device know-how is connected to applications. Early adopters have a need for quantum devices and are typically technical staff and/or scientists from industry and the public sector. Early adopters include a mix of at least fifteen staff or scientists both internal and external to the university, and will increase over time. The number of companies this represents includes at least ten and will grow over time.
- Responsibilities may involve day-to-day oversight of their actions, creating experiments, and directing research within an industry setting to raise visibility of the technology impact and to promote the responsiveness of the solution to industry targets.
- Design and implement proof of concept experiments to lead development of quantum technology solutions.
- Lead the effective implementation of early adopter projects, establishing and monitoring milestones, managing project risks and associated course-correction measures, and reporting on progress

- Oversee the design and fabrication needs of early adopters. This includes developing a strong understanding of researcher requirements from industry, other academics, national labs and medical centers. Note, early adopters will not have quantum device knowledge or experience; thus, there is a need to lead the development, engage with a broader community and teach new skills to early adopters.
- Lead exploratory discussions with early adopters, as appropriate, to maximize the utility of the target device considering all possible use cases
- Act as an expert authority on quantum device technology with early adopters, providing counsel on classical device limitations, what's achievable given current state-of-the-art, and what new applications might be enabled via science
- Lead and enable the development of quantum technologies to be deployed outside of a lab setting.

Technical Laboratory Oversight

- Overall management and responsibility for effective and safe research operations on the first two floors of RAC 2 involving 30+ labs.
- Support and participate in technical training for researchers, including senior researchers, postdocs, graduate and undergraduate students.
- Develop new laboratory technology including the design and fabrication of new equipment, and create and maintain formal processes (SOPs) for quantum devices.
- Help develop the IP around these new developments.
- Working closely with TQT researchers, oversee and train where necessary students working with the instrumentation/equipment and ensuring that all users adhere to university and government health and safety guidelines. The lab contains cryogenics, high magnetic fields, high voltage systems, x-ray and lasers, high vacuums, high temperature and toxic gases and chemicals. These systems are quite expensive (>\$15M CAD), and delicate to operate and maintain.
- The position is responsible for the safety of all facility users and workers by ensuring the implementation & ongoing upkeep of all safeguarding mechanisms and procedures and by implementing and maintaining a formal tracking mechanism for mandatory safety training of all members of the lab community including staff, students, researchers and faculty.

Knowledge Mobilization

- Lead the preparation of scientific reports and articles (scientific and administrative), and contribute to research outcomes including the preparation of professional whitepapers for wide public dissemination including CTO-level audience
- Conduct literature searches, reviews and prepares manuscripts and makes informal and formal presentations
- Provide technical expertise for academic, industrial research or contract projects

Required Qualifications

Education

- PhD connected to quantum devices and applications, quantum sensing preferred

Experience

- Five (5) years experience in academic laboratory environment
- Demonstrated experience in leading scientific projects
- Demonstrated experience in developing quantum technology towards applications
- Demonstrated experience overseeing the safe operation of equipment
- Demonstrated experience in generating knowledge transfer, including papers, talks, and patents
- Demonstrated in depth knowledge of quantum information science
- Demonstrated in depth knowledge of quantum device physics

- Demonstrated in depth knowledge of fabrication of quantum technologies

Knowledge/Skills/Abilities

- Able to take a diverse set of technological needs and map to a quantum solution
- Able to effectively communicate to a senior research group and motivate their investment towards the development of a quantum solution
- Proficient in technology development and management practices
- Exceptional time-management, communication and interpersonal skills
- Service oriented. Exceptionally positive, diplomatic and constructive attitude as required to effectively work with a large number of people with a broad range of experience, educational and diverse cultural backgrounds both within and outside the university
- Ability to work well independently and in a collaborative team environment, and the capacity to work effectively and efficiently in a complex, fast-paced and changing environment with numerous deadlines and priorities
- Works effectively leading a team
- Effective at communicating complex scientific concepts

Nature and Scope

- **Contacts:** Multidisciplinary team within the TQT program. Senior technical staff and/or scientists at external early adopter organizations.
- **Level of Responsibility:** the development of new devices and training others in their effective application; achieving quantum device development milestones according to approved plans and delivering a device that meets the early adopter's target(s); providing expert counsel on quantum device development; the management of early adopter teams comprised of senior researchers, technical staff, postdoctoral fellows and students; management of report preparation; and, in concert with Program Director, TQT, leading engagements with external organizations.
- **Decision-Making Authority:** Problem solving for early adopter engagement. Direct quantum device development (approach, connection to application etc).
- **Physical and Sensory Demands:** Typical lab environment.
- **Working Environment:** Specialized lab environment, outfitted with customized tools (see Technical Laboratory Oversight above).