



**JOB TITLE: Program Director, Transformative Quantum Technologies**

<b>DATE:</b>	April 1, 2017
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**REPORTS TO** (job title): Professor, Canada Excellence Research Chair; Principal Investigator, Transformative Quantum Technologies

**JOBS REPORTING** (job titles):

- Senior Technical Lead, Magnetic Resonance – 2 yr. contract
- RAC2 Fabrication Scientist – 1 yr. contract
- Machinist – under development
- Electronics / FPGA – under development
- Instrumentation Specialist – under development
- Administrative Assistant – presently under 1 yr. contract, permanent contingent upon funding job description under development
- Research Project Accountant – dotted line report, permanent contingent upon funding
- Research Support Specialist – dotted line report (1 day / week)
- Scientific Manager – under development
- Manager, Scientific Outreach - under development
- Administrative Officer – under development
- Administrative Advisor (Part-time) – under development
- Commercialization Resident (Part-time) – under development
- IQC Communications Staff – various dotted line reports temporal in nature as per program requirements
- Early Adopters (Part-time) – under development
- Early Adopter Advisors (Part-time) – under development

**DEPARTMENT:** Transformative Quantum Technologies (Org 8611)

**LOCATION:** RAC 2, David Johnston Research + Technology Park

**GRADE:** USG 17

**PRIMARY PURPOSE:**

Reporting to the Principal Investigator, TQT, the Program Director, Transformative Quantum Technologies (PD, TQT) is primarily responsible for leadership, establishment and oversight of the \$144M TQT program<sup>1</sup>. The PD, TQT provides strategic leadership for the planning, development, implementation, evaluation, operational management and administration of all TQT projects and services. TQT is a milestone driven, focused research initiative where projects are team efforts connected to grand challenges. This position plays a critical role in enabling the success of TQT by fostering productive research collaborations across disciplines and guiding development and deployment efforts towards impactful applications. The PD, TQT also connects effectively with early adopters and industry partners and builds upon the vision of TQT for long-term sustainability. This position involves extensive consultation and collaboration with senior leadership across campus (Deans, Faculty and Unit Directors) and significant interaction with C-level executives and leading global scientists.

**KEY ACCOUNTABILITIES:**

<b>1.</b>	<p><b>Leadership and Strategic Direction:</b> Provides overall strategic leadership, management and administration for all TQT programs and services across the University of Waterloo and with multiple external partners. Sets up the TQT program and places it on the path for success.</p> <ul style="list-style-type: none"> <li>• Provides oversight to the development of strategic plans within TQT and projected planning and expenditures for an approximate annual budget of \$21M per year.</li> <li>• Leads goal-setting activities, priority area definition and supports the review of science outcomes and plans</li> </ul>
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<sup>1</sup> TQT is a \$144M CAD university-wide program with \$76M CAD in grant funding provided by the Canada First Research Excellence Fund; the balance comes from private and other sources. It is funded for seven years (September 1, 2016 – August 31, 2023) and involves a formal partnership with the University of Ottawa and relationships with leading national and international academic institutions and other organizations including industry.

	<ul style="list-style-type: none"> <li>• Guides collaborative research efforts towards strategic opportunities including, but not limited to, the field of next generation sensors</li> <li>• Establishes strategic direction relating to academic and industry (CTOs) partnership activities, including the creation and implementation of strategies that support increased engagement</li> <li>• Facilitates the scientific agenda and establishes operational best practices in support of TQT research programs</li> <li>• Leads the engagement of early adopters and advisors to position devices for useful commercial outcomes, assist in developing targets and provide testing/feedback on the device capabilities</li> <li>• Develops strategies that attract further investment to TQT and accelerate progress towards milestones, and strategies that support the expansion of the TQT vision, building for sustainability</li> <li>• Develops and implements a seed funding program within multiple faculties, including facilitation of the Seed Grant Committee comprising senior faculty and directors across campus</li> <li>• Enables broad access of research infrastructure acquired through TQT program</li> <li>• Develops and ensures the smooth operation of a Quantum Exploration Centre to support outreach, industry engagement and undergraduate laboratory capabilities</li> <li>• Leads the commercialization activities and intellectual property training programs</li> <li>• Establishes and implements strategic plans for enhanced scientific outreach and equity performance that maintains and builds upon existing programs such as USEQIP and QInnovators</li> <li>• Leads the communication activities in support of the TQT program, competitive in quality with leading global centres</li> <li>• Provides oversight with respect to all operational matters including compliance practices with funding agency requirements (e.g., Finance, Risk, Performance, Reporting), tracking of uWaterloo and industry contributions; and management of reporting to funding agency and other partners as appropriate</li> </ul>
2.	<p><b>Planning and Assessment:</b> Provides operational and strategic planning direction with the intended outcome of optimal performance relative to the target indicators set out in the University of Waterloo – Canada First Research Excellence Fund agreement. Planning responsibilities include development, implementation and evaluation of programs and services with an ongoing focus on delivering the best evidence-based practices under the TQT program. Responsibilities include delegating, through appropriate staff, data collection and verification, programs and service evaluations and compatible strategic and operational planning initiatives. The PD, TQT is also responsible for developing a path to sustainable uWaterloo activities in quantum technologies beyond the CFREF funding term.</p>
3.	<p><b>Partnership and Stakeholder Development:</b> Responsible for establishing and maintaining effective working relationships with senior members of the university, national and international organizations, and industry in support of TQT program goals. This position involves significant strategic leadership and collaboration with three faculties and other organization units on campus in the development and execution of specialized programs.</p> <p>The formal partner in the program is the University of Ottawa who receives approx. \$9M in funding through the TQT program. In addition, there are a number of important international relationships including the Joint Quantum Institute (U Maryland and NIST), TU Delft (The Netherlands) and U Aachen (Germany) that involve focused workshops and possibly other modes of activity as the relationships evolve. Within the campus community, the PD, TQT is responsible for maintaining and strengthening communications and partnerships with university senior administration, associate deans, faculty, Institute for Quantum Computing and the Office of Research. In addition, this position plays a key role in enabling a productive relationship with the TQT Scientific Advisory Committee, and receiving strategic counsel from this committee alongside the PI and VPR.</p> <p>The PD, TQT achieves strong industry engagement through strategic planning and implementation. Specifically, the PD, TQT fosters and maintains communications and relationships with senior scientists and CTOs across TQT-relevant sectors and application domains through various forms of networking opportunities, personal visits, structured meetings and invited talks at professional conferences. The PD, TQT will identify promising applications for impactful quantum device development and deployment. The PD, TQT is also responsible for establishing effective engagement with early adopters and early adopter advisors. This may include identifying promising early adopter candidates, where possible through the PD, TQT's own domain experience and network.</p>
4.	<p><b>Staff Development and Management of External Contractors:</b> Provides the strategic leadership for acquiring the appropriate human resources, including contractors and consultants, to deliver high-quality programs and services within a lean administrative framework. Develops strategies to support increased equity performance. Facilitates the ongoing development of TQT professional staff through continuing education and coaching/mentoring arrangements. The PD, TQT is a role model for all staff in the pursuit of learning, encouraging the ongoing search for both cutting-edge and evidence-based knowledge and practices. Responsible for staff performance management including hiring, salary administration, promotions and reclassifications. The PD, TQT exercises skill in the management relationship with all staff providing productive, safe and stress-buffered working environments. Responsibilities also include training of students and developing their professional skills.</p>

<b>5.</b>	<b>Director Accountability:</b> Directs staff alignment to the mission, vision, culture, values and strategic priorities of the TQT program. Ensures that operations of the TQT delivery units are milestone-driven, collaborative and strategically aligned. Equity and shared access to resources are emphasized as key objectives in the framework of the program. The PD, TQT role encompasses responsiveness to the challenges and opportunities afforded by a diverse stakeholder profile of the TQT program.
<b>6.</b>	<b>Budget and Resource Management:</b> Oversees the TQT program budget and expenditures of \$144M+ over seven years and additional sources of funding anticipated through PD, TQT and related team efforts. This involves the management of a complex array of funding sources, investment forms and varying reporting requirements. Oversees the financial reporting to funding agencies. Also, responsible for maximizing operational efficiencies through appropriate scheduling and deployment of staff and other resources.

**POSITION REQUIREMENTS:**

**Education:**

Completion of an undergraduate degree in Engineering, Math or Science and a Master’s Degree or equivalent in business administration.

**Experience:**

Fifteen years progressive management experience in a technical setting with a proven record of achievement and success; professional technical designation (e.g., PEng) and experience as a technical practitioner and/or manager in a university setting is preferred; experience supervising and coaching high performing administrative and technical teams; advanced knowledge of operational best practices, systems and tools; competencies include strategic thinking, teambuilding, facilitation, interpersonal, organizational and communications skills; fundraising and research partnership development at the \$100K+ level with proven track record of achievement and success; demonstrated competency managing large complex programs and budgets (> \$10M CAD); must have experience working effectively across academic / national laboratories / industry / non-profit / start-ups and be able to facilitate effective engagement across sectors and establish partnerships between sectors; demonstrated ability to effectively articulate a scientific vision, translate important scientific discoveries for a wide audience and attract relevant stakeholders towards a common goal; familiarity with quantum science and related disciplines; and extensive network and domain experience in one or more relevant application areas of quantum devices (e.g., medicine, navigation, energy) is preferred.

**Technical:**

This position requires the ability to identify market opportunities for next generation sensors. She/he will bring a broad engineering perspective with key competencies in market evaluation, technology development lifecycles and technoeconomic assessment. In addition, the PD, TQT will possess the skill necessary to appropriately size the societal opportunity for various device solutions. It is important that she/he have an intuitive grasp of industry technical challenges across a wide range of sectors, the skill to validate, screen and translate these into opportunities for quantum solutions, and the ability to bring these solutions forward from TQT researchers in a collaborative manner. She/he will serve as an expert on the Canadian R&D ecosystem.

MS Word	Excel	PowerPoint	Other
Advanced	Intermediate	Advanced	Familiarity with a Macintosh computing environment and the use of electronic records systems in a research setting. Web-based systems: Proficient with Outlook, SharePoint or equivalent collaboration, records and content management systems.

**NATURE AND SCOPE:**

- Interpersonal Contacts:**

Internally, this position interacts regularly with senior administrators in the Office of Research, Institute for Quantum Computing and the faculties of Math, Science and Engineering. The PD, TQT facilitates the Seed Grant Committee.

Externally, this position interacts with national and international senior researchers and distinguished scientists, senior administration of the Canada First Research Excellence Fund, Chief of Staff for various Ministries in the Federal and



Provincial government (Science and Innovation), local MP/MPPs, Chief Technology Officers (CTOs) or equivalent and accomplished business leaders. The PD, TQT supports the PI in providing direction to the Scientific Advisory Committee.

The PD, TQT is responsible for developing and maintaining strategic working relationships in all these areas in order to fulfill the primary purpose of the position.

- **Level of Responsibility:**

This position is responsible and accountable for the development, execution and evolution of the TQT program to uWaterloo, external parties and all of its stakeholders. It is a university-wide \$144M CAD program spanning three faculties – the largest research grant the university has ever received – and is subject to a high level of reputational risk (the President is the prime signatory to the agreement). The nature of this role and the program are new and require responsible leadership in both the set up and operational functions. The PD, TQT is also responsible for supervising, mentoring/coaching all direct reports listed above.

This position is also responsible for the cultivation and stewardship of new sources of funding at the \$100K+ level, supporting significant research collaborations and building for sustainability.

- **Decision-Making Authority:**

This position has significant decision-making authority for all items outlined above. Decisions that would be referred to the PI include the establishment of new positions, programs and services not related to the above.

- **Physical and Sensory Demands:**

Minimal demands typical of a senior position operating within an office environment.

- **Working Environment:**

Exposed to stress and pressure associated with senior level responsibilities. Involves moderate psychological risk resulting from unavoidable exposure to hazardous, disagreeable or uncomfortable environmental conditions. There may be unusual hours or schedules, multiple and/or tight deadlines beyond one's control, and constant interruptions (e.g., phone calls, e-mails and unplanned but urgent support requests).