

## Call for candidates

# RESEARCH PROFESSOR IN APPLIED QUANTUM COMPUTING

N° 06626

Posting period: October 30, 2023 to January 12, 2024

**JOB DESCRIPTION:** Professor

**LOCATION:** Main Campus

**ADMINISTRATIVE UNIT:**

Faculty of Engineering

Electrical and Computer Engineering Department

**SCHEDULE:** Full time non-tenure-track position



The [Université de Sherbrooke](https://www.usherbrooke.ca) (UdeS) is seeking applications for a position as professor in Applied Quantum Computing. This is a full-time non-tenure track position in the Electrical and Computer Engineering Department of the Faculty of Engineering.

### Research chair in neutral atom quantum computing applied to industry

The successful candidate will be responsible for setting up and leading a research chair supported by PASQAL, a leading manufacturer of neutral atom quantum computers. The general objective of the Chair is to find ways of delivering quantum advantage to industry using neutral atom algorithms. It is accompanied by a contribution from the industrial partner of \$100,000 CAD per year for 5 years. This contribution is to be used as a match with federal and/or provincial granting agencies (e.g., Natural Sciences and Engineering Research Council of Canada [Alliance program](#); and [Regroupements sectoriels de recherche industrielle au Québec](#)).

This Chair in Quantum Computing is intended to be particularly applicative, with many projects linked to industrial end-users. The Chair is part of PASQAL's strategy to bring quantum computing capabilities that deliver value to industry, and to target the quantum advantage for real-world applications in the short term. PASQAL is setting up its North American manufacturing and performance center in Sherbrooke, in the brand-new Espace Quantique 1 building on Roy Street, which will house a number of industrial and start-up quantum companies. The successful candidate will contribute not only to the creation of quantum software solutions for industry, but also to making quantum computing an industrial reality.



## Equity, diversity and inclusion

The Université de Sherbrooke (UdeS) values equity, diversity, equality and inclusion in employment within its community and invites all qualified individuals to apply, particularly women, members of visible and ethnic minorities, Aboriginal peoples and [persons with disabilities](#) in compliance with the Quebec Act respecting equal access to employment in public bodies. The screening and assessment tools can be adapted according to the needs of persons with disabilities who request them, and this, in complete confidentiality. The Université de Sherbrooke also encourages people of all sexual orientations and gender identities to apply. Priority will be given to Canadians and permanent residents. [Learn more about equity, diversity and inclusion at UdeS.](#)

## About the Faculty of Engineering

The UdeS [Faculty of Engineering](#) is a leader in education and applied research. Recognized for its dynamism in collaborative research, it stands out particularly in terms of technology transfer and concrete impacts on society.

It is also a faculty on a human scale, which favours rigorous and complete training of its students, particularly through the alternating [study and internship program](#). In a friendly and highly collaborative environment, discovery and innovation are strongly encouraged.

To foster its long-term growth, the Faculty of Engineering is particularly focused on interdisciplinary initiatives and emerging fields. The Faculty of Engineering has several research centers as well as the [Interdisciplinary Institute for Technological Innovation](#) (3IT), a part of the Integrated Innovation Chain along with the [Institut quantique](#) (IQ) and the [Centre de collaboration MiQro Innovation](#) (C2MI).

[Discover all the advantages of a career at the UdeS Faculty of Engineering, in the heart of the Eastern Townships!](#)

## About PASQAL

PASQAL is a major player in the global race for quantum computing. The company is the leading manufacturer of neutral atom quantum computers and offers complete solutions for end-users. PASQAL's products and services include quantum computers, cloud access and software solutions for the energy, mobility, healthcare, high-tech, aerospace and financial sectors. By leveraging the dual analog/digital nature of its quantum computers, PASQAL is propelling neutral-atom quantum technology with the aim of delivering a practical quantum advantage on early use cases within the next five years. Find out more about [PASQAL](#).



## About the Departments

The faculty members of the [Electrical and Computer Engineering Department](#) are active in the fields of classical and quantum embedded systems engineering, autonomous vehicles, robotics, embedded artificial intelligence, neuromorphic systems, instrumentation and digital communications. The Department has seven research chairs and offers master's and doctoral programs that allow students to work in infrastructures that bring together numerous cutting-edge research laboratories under the direction of internationally recognized researchers. The Department's facilities include clean rooms for microfabrication, development and characterization laboratories for integrated circuit packaging, smart antennas and software-defined radio, medical devices, instruments for particle physics, power electronics and electric vehicles, embedded systems and robotics, as well as a platform for the design, development and fabrication of printed electronic circuits, a 1MW solar infrastructure, and a space and immersive audio room. Of the University's six institutes, the Department's faculty members are notably involved at [3IT](#), [IQ](#) and the [Research Center on Aging \(CDRV\)](#).

## Expertise

The successful candidate will carry out applied research in the following area(s):

- Identifying use cases for which the neutral-atom algorithmic approach can develop quantum advantage, in partnership with industrial end-users.
- Exploring the potential of quantum advantage through graph theory.
- Work on NISQ protocols/algorithms (variational, adiabatic) to identify innovative performance-enhancing paths.
- Quantum simulation of highly correlated systems in connection with condensed matter modeling topics.

The candidate must be able to understand the need for computing capacity, and to lead exploratory projects.

This research chair will evolve in line with developments in neutral-atom quantum computing technologies, and its work will be geared towards identifying the most effective algorithmic approaches for solving problems useful to the business world.

## Functions

- Develop fundamental or applied research activities related to the Chair.
- Supervise highly qualified personnel, including graduate and undergraduate students.



## Requirements

- Hold a doctorate in a relevant discipline
- Have carried out research and/or development projects in the field of quantum computing
- Have an interest in research (disciplinary, interdisciplinary), innovation and knowledge transfer.
- Be able to plan, organize and develop a project independently.
- Demonstrate an ability to supervise graduate students.
- Have previously published in peer-reviewed journals.
- Demonstrate the ability to establish and maintain good interpersonal relationships, collaboration and teamwork skills.
- Demonstrate leadership qualities, initiative and excellent ability to communicate and interact effectively and smoothly with various internal and external partners.
- Ability to comply with the requirements of [responsible research conduct](#).

The working conditions are governed by the collective agreements in force.

Non-tenure-track full-time research position with possibility of renewal for a second five-year term, based on evaluation of research results.

Anticipated start date: March 2024.

## Application process


The deadline for submitting applications is **January 12, 2024**.

Examination of applications will begin on January 13, 2024, and will continue until the position is filled.

We invite you to submit your application electronically by clicking on the "[Postuler](#)" button.

Please combine the following in one pdf document: (please provide complete files)

1. Your curriculum vitae;
2. A letter of motivation;

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3. A proposal for a research chair program (2 pages) describing the problem, objectives, methodological approach, links with your previous work, as well as the training of highly qualified personnel (students, research staff, etc.). The adequacy with the strategic plan of the Université de Sherbrooke and the Faculty of Engineering should also be explained. Funding opportunities (granting agency programs, companies, etc.), as well as the collaborations and networking envisaged should be described;
  4. A one-page text on equity-diversity-inclusion (EDI) that presents specific actions already taken or planned to promote EDI (i) in the training of new staff (recruitment, mentoring, career development); (ii) in the realization of research projects; and (iii) in the involvement in university life. We invite you to consult the [guide to submitting an EDI text](#) (in French). The Faculty is interested in individuals whose research, teaching, and community involvement demonstrate the importance it places on diversity in higher education;
  5. Reprints from the most relevant recent contributions (maximum 3).

In addition, please have **three external referees** each send a letter of recommendation directly to the contact information below:

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