



# INTERDISCIPLINARY INSTITUTE FOR TECHNOLOGICAL INNOVATION (3IT)

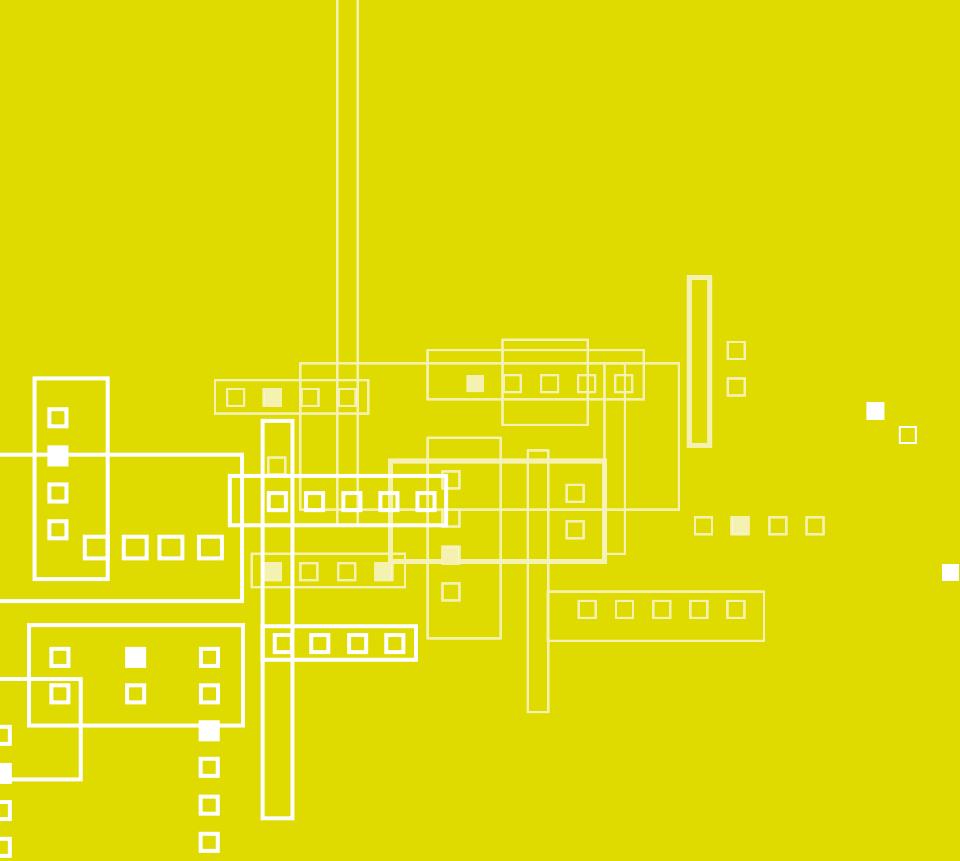
Design, integration and commercialization:  
from nanotechnologies to systems and their  
applications



STRATEGIC  
PLAN  
2010-2014



UNIVERSITÉ DE  
SHERBROOKE



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# A WORD FROM THE DIRECTORS



Technological innovation through the pairing of university research with industry is the ideal response to concrete, present-day problems. To accomplish that pairing, in 2002 a project was launched that quickly proved its value. Originally named the Centre of Excellence in Information Engineering (CEGI), it is now known as the Interdisciplinary Institute for Technological Innovation (**3IT**). What began as a faculty concept has evolved into an interdisciplinary, intersectoral project that places research in nano and microtechnology, biomedical engineering, telecommunications, information systems, robotics, ethics of technological development and innovation management, in an environment that facilitates their application, integration, evaluation and commercialization. That evolution, from a centre in 2005 to an infrastructure project in 2007 and now, since 2008, to a university institute, has been remarkable. The basis of the Institute is the interplay

between our strengths in the disciplines mentioned above and our lively dedication to intersectoral and integrative activities. Innovation, validation and commercialization of the resulting technologies: together they will generate the productivity, economic growth, wealth creation and social well-being that are essential for Québec and Canada to be prosperous leaders on the world stage.

It is our ambitious mandate to tackle those challenges. The success of the project demands a clear and common vision, courage and perseverance to accomplish our goals, and a willingness to adopt new ways of innovating, new approaches in which industry and the university work together, and new partnerships for a chain of innovation leading all the way through to optimal commercialization. These distinctive elements bring the Université de Sherbrooke an undeniable competitive advantage that will be shared by all of our university, industry and public sector partners. Through the collaboration and complementarity of the Institute's activities with other actors at the regional, provincial, national and international levels, but particularly with our members and partners, **3IT** will be an active and engaged contributor to technological innovation.

The following pages present our reflections on the current state of the Institute and the future to which it aspires. The vision and mission of the Institute are conveyed more clearly by its new name. With our host building now being constructed in Innovation Park, with further development opportunities always being pursued, and with our many activities proceeding apace in research, training and industry-university collaboration, we hope this strategic plan contributes to making the Institute exceptionally able to achieve its purpose.

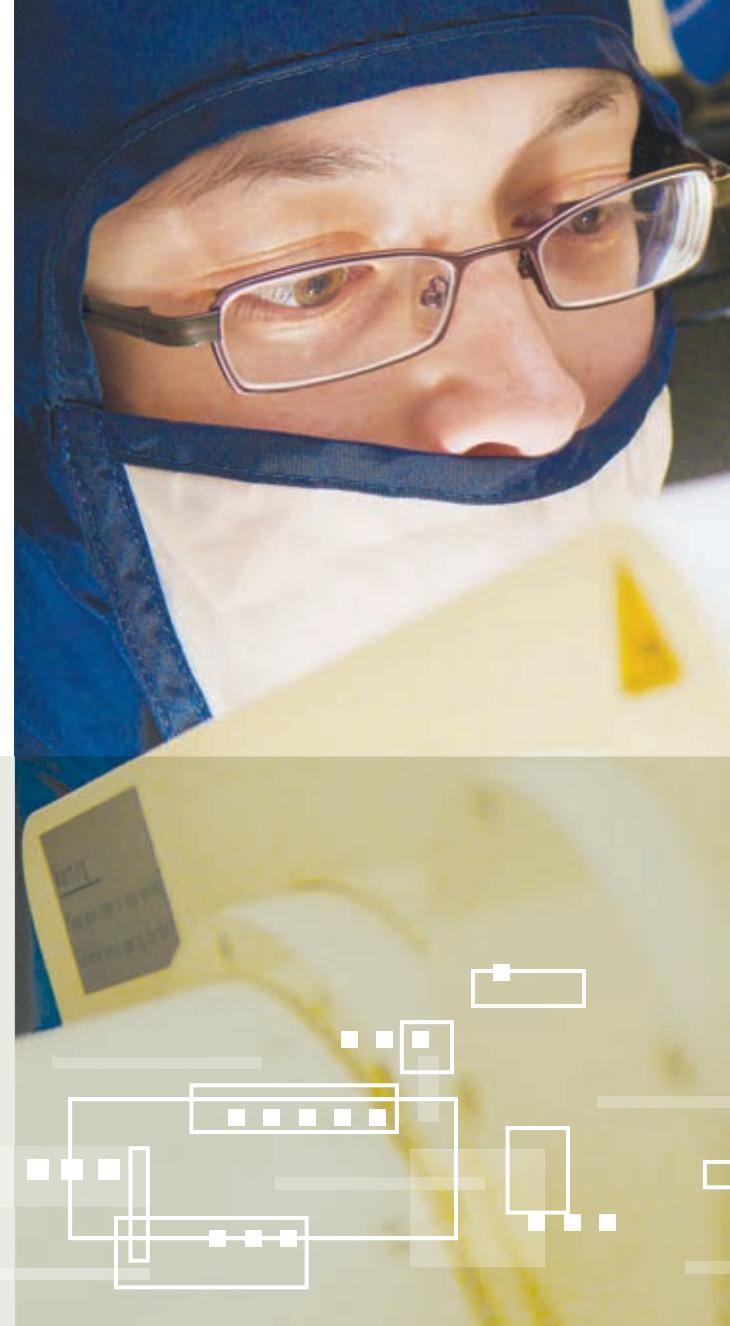
**Prof. François Michaud, Eng., Ph.D.**  
Director

**Prof. Dominique Drouin, Jr. Eng., Ph.D.**  
Assistant Director

TO SUPPORT FUTURE GROWTH, 3IT'S ADMINISTRATIVE TEAM ENSURES THAT MEMBERS HAVE ALL OF THE TOOLS AND PROCESSES THEY NEED.

**The years from 2002 to 2009 saw many accomplishments, including:**

- Development of a vision and a uniquely innovative mission for the academic environment;
- A critical mass of members: in 2009, **3IT** numbered 30 researchers, 45 research professionals and technicians and more than 240 highly qualified people from four faculties (Sports and Physical Education, Engineering, Medicine and Health Sciences, Science);
- \$24M in grants from the Ministère du Développement économique, de l'Innovation et de l'Exportation du Québec (MDEIE), Canada Economic Development (CED) and Université de Sherbrooke for the construction of a new building in Innovation Park;
- More than \$46M in grants since 2004;
- Recognition as a major infrastructure by Nano-Québec (\$430 000 per year, for 6 years);
- \$1M in association with the Department of Electrical and Computer Engineering of Université de Sherbrooke to provide funding to graduate students (both master's and doctoral) working on interdisciplinary projects involving telecommunications and advanced digital signal processing;
- Recognition of **3IT** as a university institute and the setting up of the Executive Management Office, the Institute Advisory Board and the Scientific Advisory Board.





# FOREWORD

The 2010-2014 strategic plan is ambitious, yet realistic and inclusive. We have surveyed our members, and they have confirmed the orientations and objectives planned for this period, which reflect the commitments and aspirations of our researchers. This is the first strategic planning exercise of such scope for **3IT**, and we are confident that the next few years will be memorable and beneficial for everyone in **3IT**'s university and industrial community.

## MISSION

TO OFFER AN INFRASTRUCTURE FOR SCIENTIFIC INNOVATION AND TECHNOLOGY MATURATION, FROM IDEA TO MARKETING, DEVICE TO PROOF-OF-CONCEPT AND VALIDATION, BY SUPPORTING THE COLLABORATIVE WORK OF UNIVERSITY RESEARCHERS AND INDUSTRIAL MEMBERS, AND BY INTEGRATING THE DISCIPLINES OF NANO AND MICROMECHANICAL TECHNOLOGIES, BIOMEDICAL ENGINEERING, TELECOMMUNICATIONS, INFORMATION SYSTEMS, ROBOTICS, ETHICS OF TECHNOLOGICAL DEVELOPMENT AND INNOVATION MANAGEMENT.

## VISION

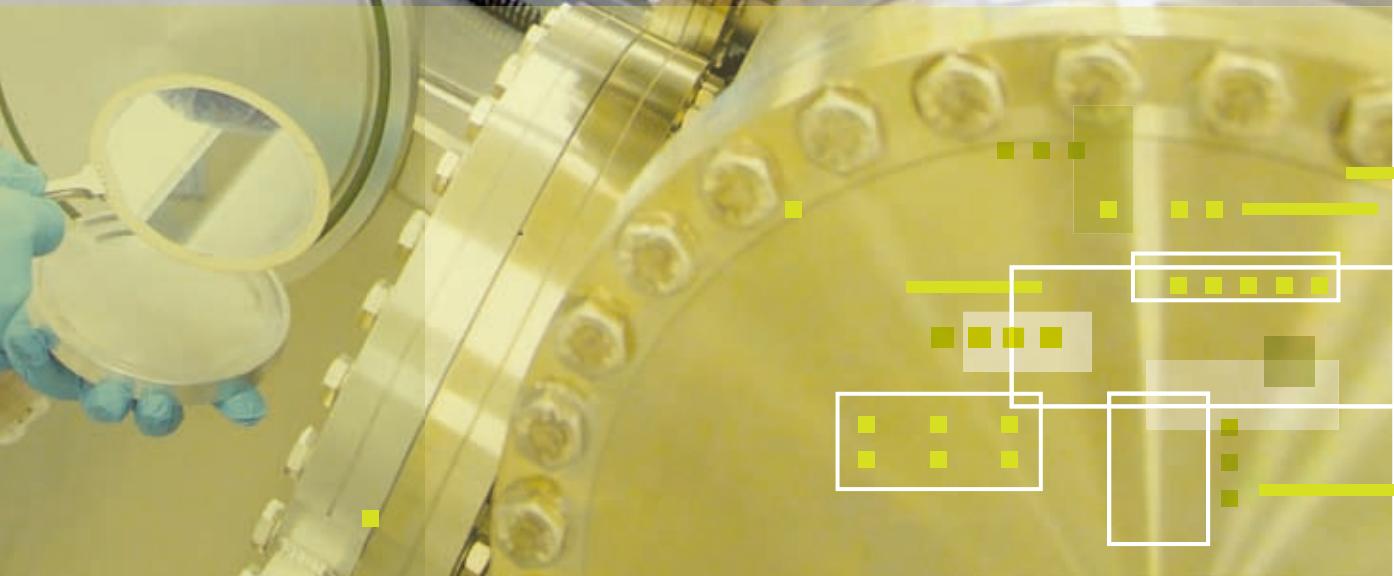
**3IT** is set to be an engine and a showcase for innovative practices in university and industrial research. Socially and economically responsible, **3IT** accelerates technology transfer in strategic sectors including medical technologies, information and communication technologies, transportation and energy.

## VALUES

- EXCELLENCE
- BOLDNESS
- ACTION
- SYNERGY
- PRAGMATISM
- OPENNESS



MISSION  
VISION  
VALUES





CEGI  
BECOMES  
3IT

A TURNING POINT WAS REACHED IN 2008-2009 WHEN CEGI (THE CENTRE OF EXCELLENCE IN INFORMATION ENGINEERING) OBTAINED THE STATUS OF UNIVERSITY INSTITUTE. UNPRECEDENTED EFFORT SINCE THEN HAS GONE INTO A VISIBILITY PLAN TO MATCH THE ASPIRATIONS BEHIND CEGI. ONE RESULT: A NEW NAME, RICH IN MEANING AND A SENSE OF THE FUTURE.

**NEW NAME:**

**Interdisciplinary Institute  
for Technological Innovation (3IT)**

**NEW POSITION STATEMENT:**

**Design, integration and commercialization:  
from nanotechnologies to systems and their  
applications**

The new name highlights our recent recognition as an institute and the fact that our critical mass of researchers justifies that status. The terms “interdisciplinary” and “technological innovation” now replace the expression chosen in 2002, “information engineering”, because they evoke the synergetic nature of the work being conducted in high technology sectors. The position statement expands on the new name by stating clearly the cross-cutting nature of the Institute’s activities (design, integration and commercialization) and its areas of activity (from nanotechnologies to systems and their applications).

The new name was chosen by our members in a spirit of collegiality. This is the first in a series of steps that will lead to the deployment of an image and a visibility plan in line with the Institute’s vision and mission.



A HOME FOR 3IT IS NOW UNDER CONSTRUCTION IN UNIVERSITÉ DE SHERBROOKE'S INNOVATION PARK, ON SCHEDULE FOR INAUGURATION NEAR THE END OF 2011.

THE BUILDING WILL COVER A TOTAL AREA OF 7190 M<sup>2</sup>. WITHIN THIS FACILITY, SCIENTISTS AND PEOPLE IN INDUSTRY WILL WORK TOGETHER FROM DESIGN TO COMMERCIALIZATION, ENJOYING A CUTTING-EDGE TECHNOLOGICAL INFRASTRUCTURE THAT PROVIDES, UNDER A SINGLE ROOF, A COMPLETE INNOVATION CHAIN WITH NO EQUAL IN NORTH AMERICA. THE BUILDING WILL INCLUDE FACILITIES FOR INTERDISCIPLINARY UNIVERSITY/INDUSTRY RESEARCH.

850 m<sup>2</sup>

**Nanofabrication and Nanocharacterization Laboratory**

This Class-100 clean-room laboratory conducts fundamental and applied research in micro-electronics, nanoelectronics, optoelectronics, telecommunications and biomedical sensors.

755 m<sup>2</sup>

**Materials Characterization and Synthesis Laboratory**

This clean environment facility offers a wide range of equipment and expertise devoted to the synthesis, processing and fine analysis of devices and the advanced materials of which they are composed.

# A UNIQUE FACILITY



**410 m<sup>2</sup>**

#### **Design and Prototyping Laboratory**

This infrastructure serves for the design of advanced prototypes involving expertise in microelectronics (including encapsulation for device integration in nanotechnologies), mechanics (thanks to rapid prototyping equipment), and computing. Prototypes can then be used in concrete implementations and for technological evaluation.

**350 m<sup>2</sup>**

#### **Usability and Ergonomics Laboratory**

This laboratory is designed for the study of interactions between users and various technologies, in conditions that are as close as possible to reality. It combines modular spaces that can reproduce the

various environments and usage conditions of these technologies with complex measurement systems to capture user behaviors and actions. The Laboratory also has a telecommunication network emulator for the reproduction of network transmission conditions.

**220 m<sup>2</sup>**

#### **Modular Spaces**

Free spaces can be configured to the needs of **3IT's** industry members.

**1200 m<sup>2</sup>**

#### **Office Spaces**

150 offices and meeting rooms are available for university researchers and industry members.



## ORIENTATION I

To act as a locus of scientific innovation  
for technology incubation

To achieve its objectives, **3IT** acts as a technology incubator by giving the means for academic researchers and industry members to innovate and achieve successful technology transfers.

### Objectives

1. Train the highly qualified and innovative people who are essential to Québec and Canadian industries, focusing on the disciplines of **3IT** (nano and microtechnology, biomedical engineering, telecommunications, information systems, robotics, ethics of technological development, innovation management), as applied to the strategic sectors of medical technologies, information and communication technologies, transportation and energy.
- 2 . Put in place a dynamic, flexible model of university-industry interaction to share an advanced infrastructure and specialized human resources while respecting confidentiality and industrial secrets.
3. Provide scientific leadership, networking and promotion of the expertise, services and technological platforms available at **3IT** to create bridges within Université de Sherbrooke and with industry and public and quasi-public bodies.

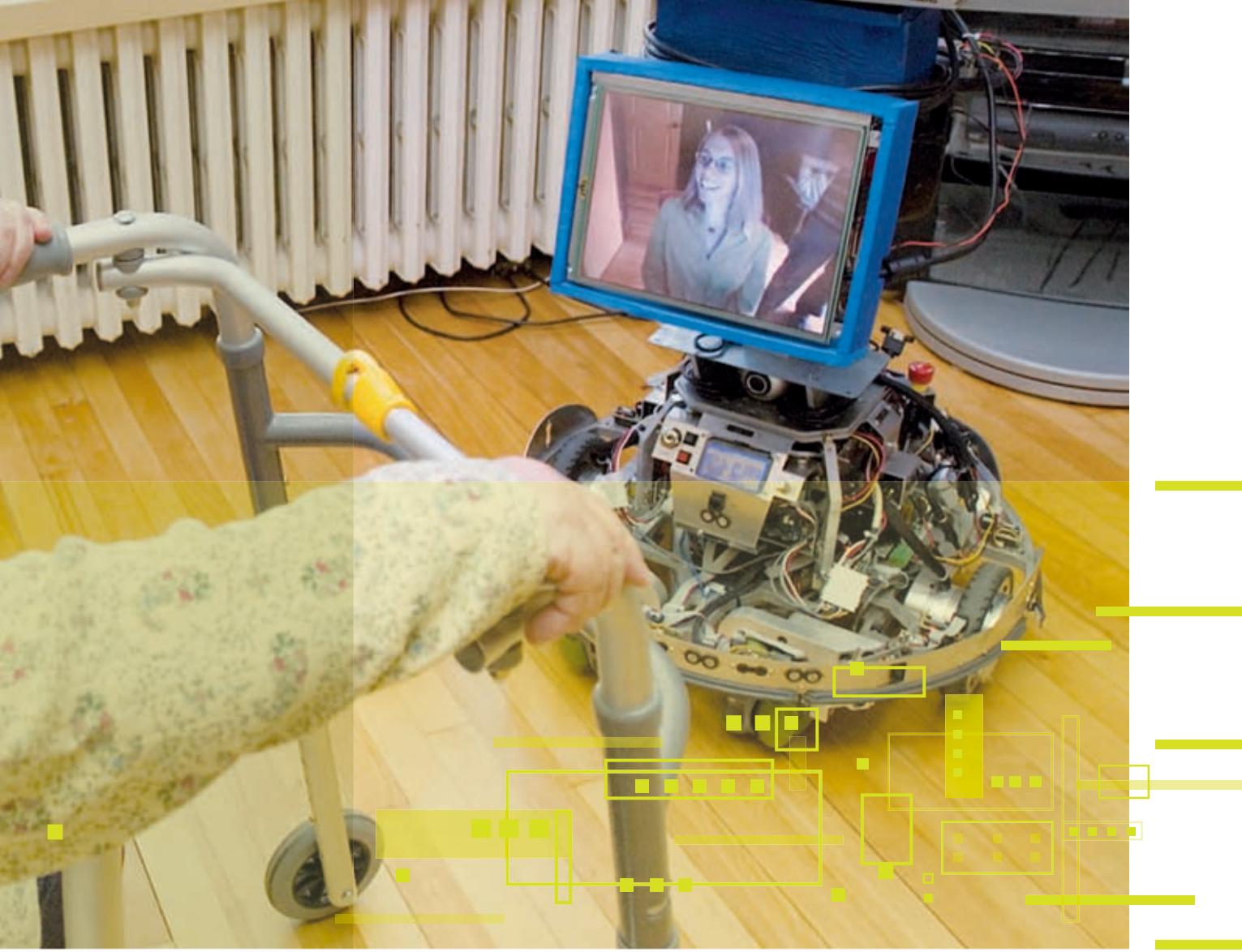


## ORIENTATIONS

## ORIENTATION II

Establish an interdisciplinary continuum  
of scientific innovation and technology  
maturation

**3IT** encourages cross-cutting innovation that eliminates the borders between disciplines in order to satisfy real needs. It frees specialties from their silos, fostering a continuum of scientific innovation and technology maturation that is unique across Canada. The result is an ecosystem for research and innovation, ranging from nanotechnologies to device characterization, from electronic encapsulation and prototyping to their use in functional systems and their evaluation in real conditions.



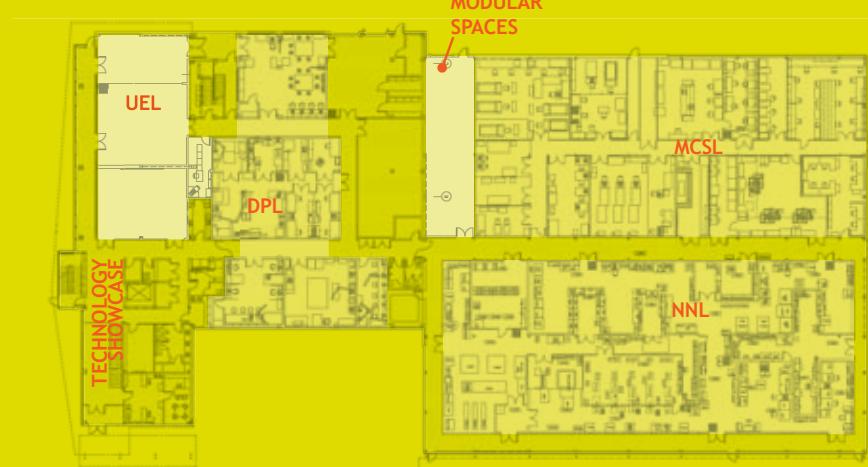
## Objectives

1. Provide equipment and draw on the necessary human resources to form interdisciplinary teams for technological innovation, support for research and publication, thereby setting up a complete chain from design to validation.
2. Serve as a catalyst to attract outstanding professors, students and businesses to Université de Sherbrooke, facilitating the development of niches of research excellence in the disciplines and strategic sectors of **3IT**.
3. Encourage close and cohesive relations among **3IT** researchers, Université de Sherbrooke and its academic, industrial and public partners, such as the MiQro Innovation Collaborative Centre (C2MI).

THIS STRATEGIC PLAN FORMALIZES 3IT'S OBJECTIVES BY PROPOSING AMBITIOUS STRATEGIC ORIENTATIONS. A STRATEGIC ACTION PLAN IS COUPLED TO THOSE ORIENTATIONS TO ENSURE THAT THEY ARE ACCOMPLISHED. THE NEXT FOUR YEARS (2010-2014) HOLD SIGNIFICANT CHALLENGES, WITH A VISIBILITY PLAN TO BE DEPLOYED AND PARTNERSHIPS TO FORM WITH INDUSTRY AND OTHER UNIVERSITY INSTITUTIONS. SETTING UP MATERIAL, ADMINISTRATIVE AND HUMAN INFRASTRUCTURES WILL ALSO BE TOP PRIORITIES, NOT TO MENTION SUPPORTING RESEARCH AND THE GLOBAL REACH OF OUR RESEARCHERS. ALL ACTIVITIES WILL BE EVALUATED REGULARLY TO MEASURE THE IMPACT OF STRATEGIC ACTIONS TAKEN FOR THE DEVELOPMENT OF 3IT.

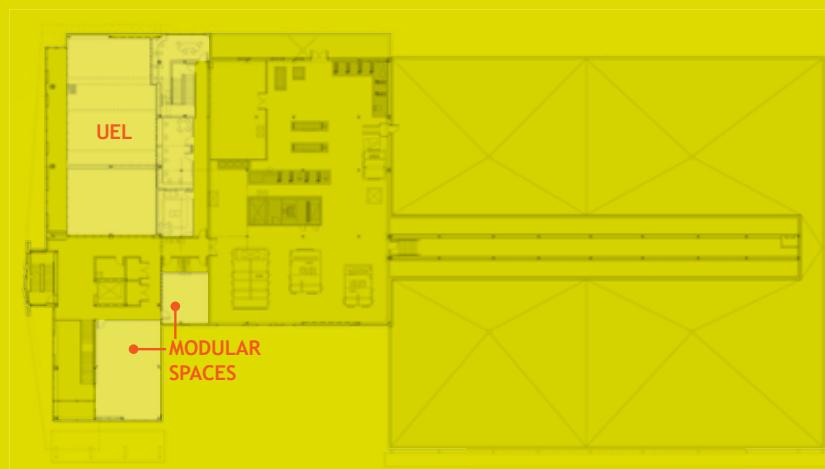
## AFTERWORD

Since collaboration is at the very heart of **3IT**, we must underline the many contributions without which it could not exist. Université de Sherbrooke has been a passionate defender of the Institute's vision and mission from the beginning. The support of participating faculties has also been crucial, at every stage, to the success of our initiatives. Contributing both financially and strategically, our funding agencies – the Ministère du Développement économique, de l'Innovation et de l'Exportation du Québec (MDEIE) and Canada Economic Development (CED) – have guaranteed the success of our efforts. Lastly, we must not forget the unfailing support of our members, the root of **3IT**'s *raison d'être*.



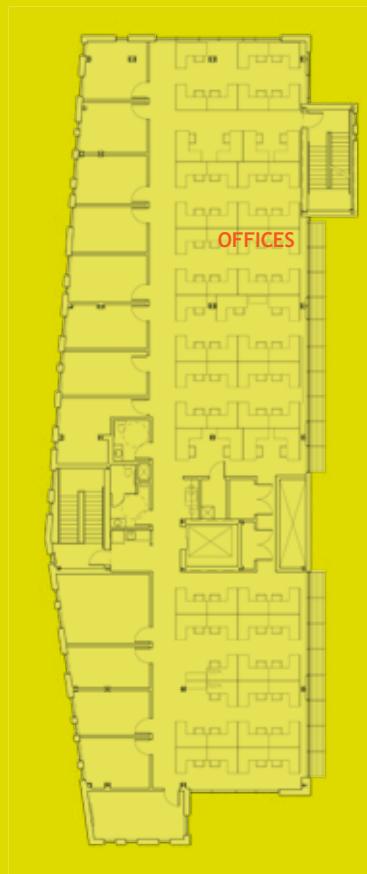
## 1<sup>ST</sup> LEVEL

- NNL - Nanofabrication and Nanocharacterization Laboratory
- MCSL - Materials Characterization and Synthesis Laboratory
- DPL - Design and Prototyping Laboratory
- UEL - Usability and Ergonomics Laboratory



## 2<sup>ND</sup> LEVEL

- UEL - Usability and Ergonomics Laboratory



## 3<sup>RD</sup>, 4<sup>TH</sup> AND 5<sup>TH</sup> LEVELS

- Office Spaces

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et de l'Exportation

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