C2MI

MiQro Innovation Collaborative Centre

HIGHLIGHTS REPORT 2014-2015

April 1, 2014 to March 31, 2015

Gouvernement du Canada
Réseaux de centres d'excellence

Government of Canada
Networks of Centres of Excellence

TABLE OF CONTENTS

MESSAGE FROM THE CHAIRMAN OF THE BOARD

Louis Labelle

Another prosperous year comes to an end for the MiQro Innovation Collaborative Centre (C2MI) and we are proud of the progress made. This year has been a hub between the initial sprint and the change of pace towards an endurance event! One of the crucial elements of this year will have been the completion of our very first strategic planning. This intensive exercise allowed us to better examine, analyze and understand our environment so that we can position C2MI as one of the leading innovative players in the industry. This stage allowed us to define more than fifty concrete actions that will be deployed according an established schedule.

We also are extremely pleased that the Government of Canada has recognized C2MI's contribution to the commercialization objectives of the CECR. We have secured additional funding that will allow us to maintain the growth rate that the Center has experienced over the past four years. This renewal will help us to seize the opportunities of the emerging digital world, which is expected to grow phenomenally, and to support economic development.

This additional funding will strengthen our position as a center of international innovation in the development of microsystems and allow us to continue the work begun in collaboration with start-up companies, SMEs, industry, academics and partners and to conclude by the commercialization of new technological products.

The C2MI ecosystem continues to grow at an exceptional pace with more than 100 customers, partners and members!

Louis Labelle

MESSAGE FROM THE CHIEF EXECUTIVE OFFICER

Normand Bourbonnais

The MiQro Innovation Collaborative Centre (C2MI) continues its progress. The pages of this report provide a summary of the Centre's activities over the past 12 months. The C2MI team, supported by a devoted and participative Board of Directors, has enabled us to carry out a colossal strategic planning work that we have the satisfaction of implementing.

Managing our unique advanced infrastructure, assessing the technical needs of members and partners, training and networking activities, colloquia and symposium, and participation in several shows are among the priorities of the C2MI team. This year we also played a more prominent role in the community by reaching out and sharing the Centre's activities with the public.
We held open doors for the employees' family as well as for the members and the partners. We also hosted a cohort of students from the Bromont elementary schools and offered them various technical activities to discover what work is being performed at C2MI. We also participated in the filming of scientific vulgarization with the Code Chastenay team which intentions were to demystifies the microsystems universe.

I cannot leave untold, the grant of a first NSERC-IBM Canada Industrial Research Chair in Smarter Microelectronics Packaging for Performance Scaling to create smaller, more robust and more powerful electronic components. The objectives of the Chair are to develop several new approaches ranging from robust industrial manufacturing processes to the development of new materials that increase the strength and reliability of electronic components. In addition, it helps the training of an expert succession to increase the competitiveness of companies. Student training takes place in the unique collaborative environment of C2MI and the Interdisciplinary Institute of Technological Innovation (3IT).

Finally, the National Symposium held in collaboration with CMC Microsystems and ITAC under the theme "Innovation by Design" was the largest gathering of Canadian representatives in the microsystems industry. C2MI contributes in benchmarking Canada among the world's best renown reference for technological innovations.

THE MIQRO INNOVATION COLLABORATIVE CENTRE– C2MI

Since 2012, the C2MI positions itself as a unique research and development center dedicated to microelectronics in the world. The Center welcomes microelectronics industry key players who come and carry out R & D work to accelerate the commercialization of their products, as well as a growing number of marketing partners and academic partners which make this ecosystem a nursery of possibilities of collaboration.

Our vision

Be an international reference in scientific research and commercialization in the fields of packaging and testing of complex microsystems and micro electromechanical systems (MEMS).

Our mission

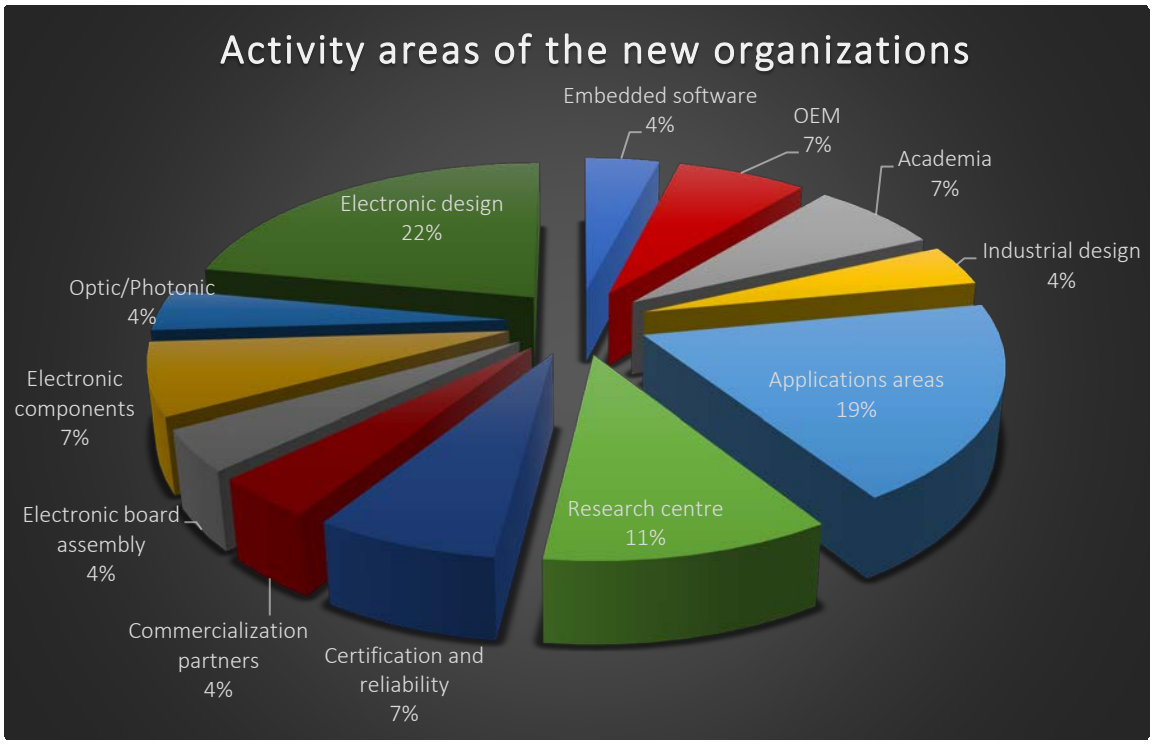
Help produce prototypes dictated by market needs in fields of applications such as information and communication technologies, automotive, aerospace, environment and health to accelerate their commercialization.

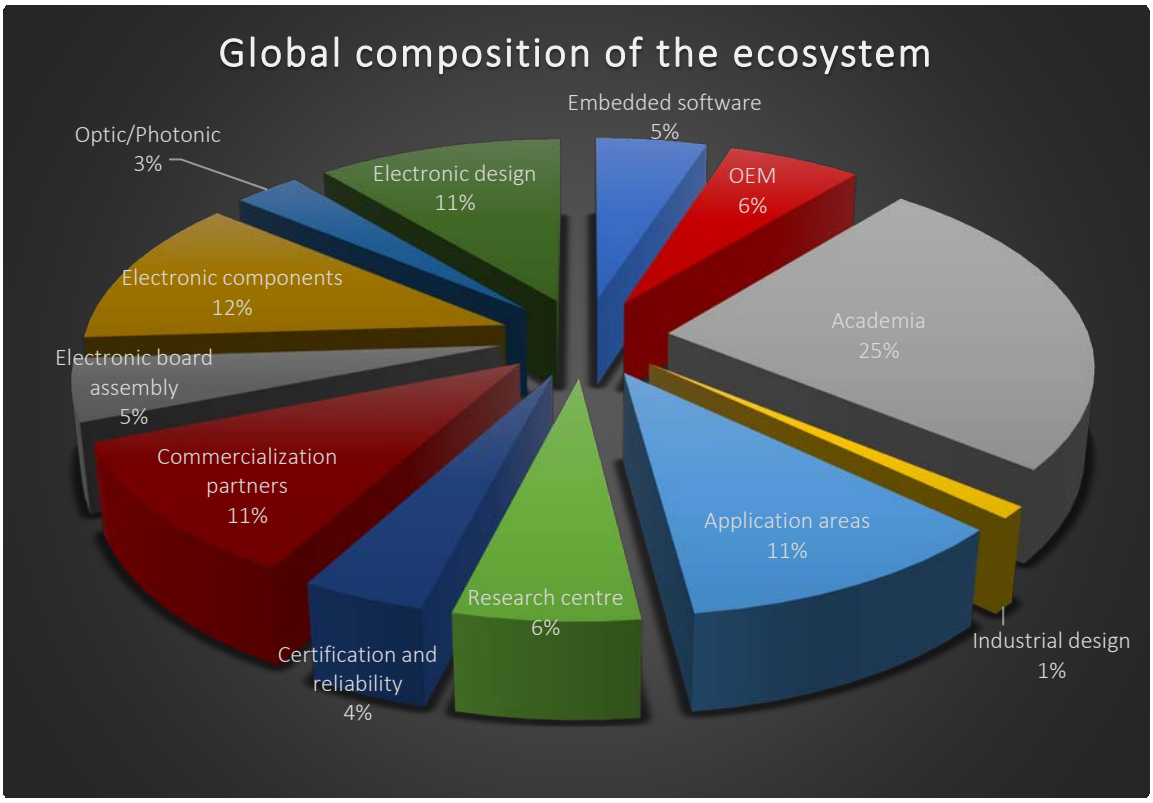
C2MI: A WIDE-RANGING ECOSYSTEM

During the past months, the C2MI ecosystem grew rich with the expertise and skills of 27 new organizations. The fields of activity of these new members and partners allow a more diversified offer.

NEW MEMBERS

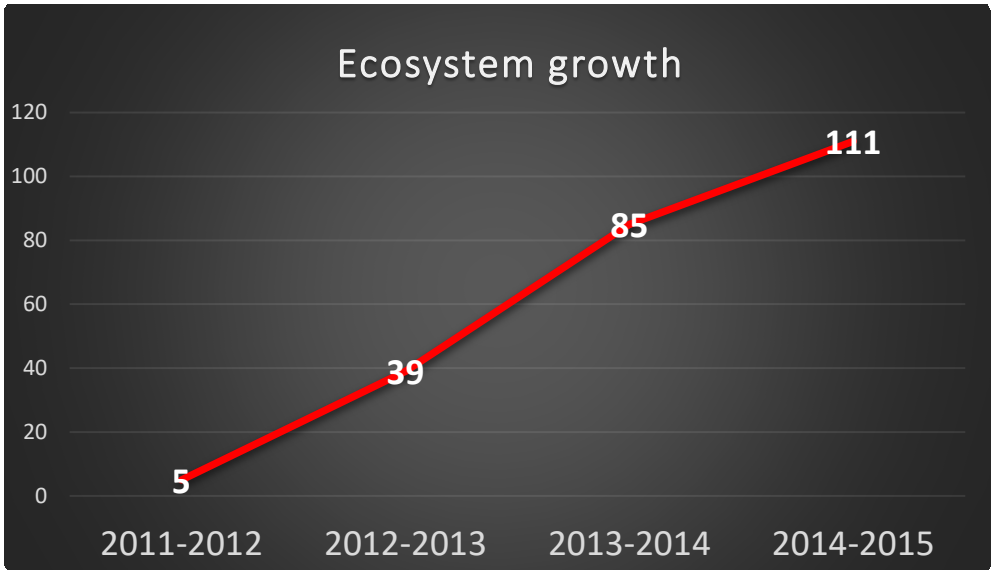
Aeponyx : *Optic/Photonic*
Alces Technologies : *Application areas*
Aveni : *Certification and reliability*
Averna : *Electronic design*
Biointelligence : *Application areas*
CEA-Leti : *Research centre*
CEM : *Certification and reliability*
CIMEQ : *Electronic design*
CNRS : *Research centre*
Digico : *Electronic board assembly*
Ecoligence : *Application areas*
EHT International : *Electronic design*
Explora : *Industrial design*
Eyelit : *Embedded software*
Fiarex : *Electronic design*
Freescale : *Electronic components*
Hoskin : *EOM*
IngeniArts : *Application areas*
Ipdia : *Electronic components*
McMaster University: *Academia*
NanoElec : *Research centre*
Parker Hannifin : *Application areas*
ReSMIQ : *Microsystems design*
SVS : *EOM*
Sysacom : *Electronic design*
TechMark Global : *Market analysis*
University of d'Ottawa : *Academia*

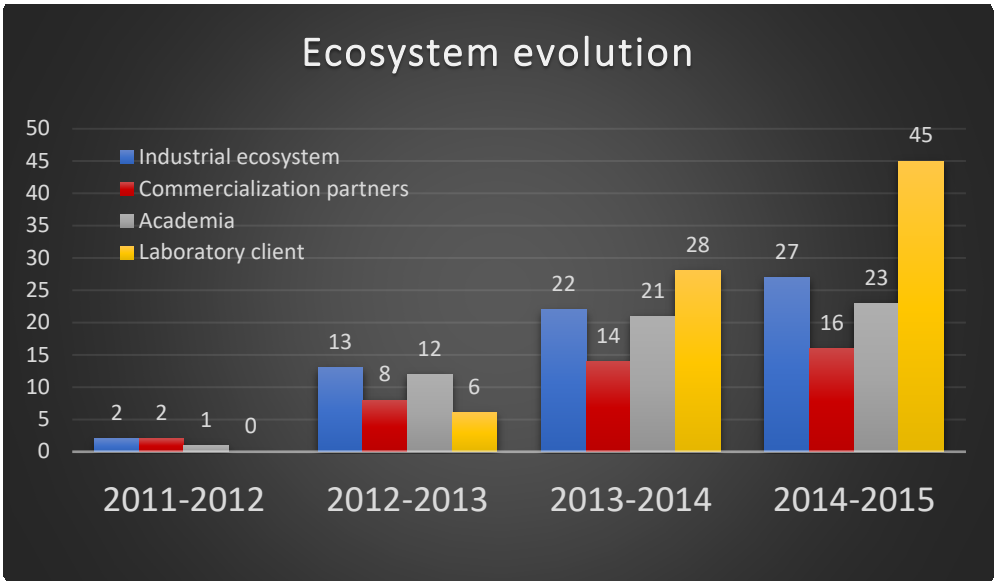

Activity areas of the new organizations
Embedded software 4%
OEM 7%
Academia 7%
Industrial design 4%
Applications areas 19%
Research centre 11%
Certification and reliability 7%
Commercialization partners 4%
Electronic board assembly 4%
Electronic components 7%
Optic/Photonic 4%
Electronic design 22%


Global composition of the ecosystem
Embedded software 5%
OEM 6%
Academia 25%
Industrial design 1%
Application areas 11%
Research centre 6%
Certification and reliability 4%
Commercialization partners 11%
Electronic board assembly 5%
Electronic components 12%
Electronic design 11%
Optic/Photonic 3%

C2MI: A SIGNIFICANT GROWTH

The C2MI has a constant and steady growth. Its attraction strength rests on the expertise and know-how of members and partners as well as the capabilities of the infrastructure and its state-of-the-art equipment. The Center and its partners invest annually in new equipment to ensure they have the capability to maintain technological advances in response to market-driven needs in a variety of economic sectors. Revenue from product development grew strongly, increasing by more than 60% over the previous year. Increasingly, the expertise and capabilities of C2MI are shining in the world of electronic microsystems.





C2MI FIGURES 2014-2015

INVESTMENTS

4M $ in capital investments.

R&D **52M $** invested in R&D.

PROJECTS

80 new products developed.

64 industrial projects.

14 industry-university collaboration projects

PATENTS

36 patents and industrial secrets obtained.

14 pending patents.

NEW MARKETS ADDRESSED

32 new markets :

- MEMS speakers;
- Microfluidic devices;
- 22nm technology;
- Infrared sensors;
- Inertial sensors.

RELATED JOBS

840 jobs related with new products development.

65 students, scientists and researchers associated with the projects development.

ECONOMIC IMPACT 2010-2015[1]

C2MI plays a leading role in the regional and national economy. We work with businesses at all stages of their development and across multiple industry sectors, generating net economic gains for Canada.

11,4 M$ in capital investments.

131 industrial projects

138 M$ invested in R&D.

70 Near **70** new markets addressed.

About **40** industry - university collaboration projects.

96 patents and industrial secrets obtained
13 intellectual property agreement.
45 pending patents.

More than **65** HQP and professors involved in industrial projects.

More than **240** new products associated with more than **1150** person-year jobs.

[1] C2MI Data Nov. 2010 to March 2015

PUSHING THE BOUNDARIES FURTHER

NSERC/IBM Canada Industrial Research Chair Research

Creating Smaller, More Robust, and More Powerful Electronic Components

The Natural Sciences and Engineering Research Council of Canada (NSERC) allies with IBM Canada and the Université de Sherbrooke for the creation of this research chair. Its objective: develop several new approaches from the manufacturing strong processes to the development of new materials which will increase the resistance and the reliability of electronic components.

NSERC/IBM Canada Industrial Research Chair holders, Professors at the Université de Sherbrooke: David Danovitch, Julien Sylvestre and Dominique Drouin.

The research chair benefits from a total investment of $9,1 M. The Natural Sciences and Engineering Research Council of Canada (NSERC) is providing $2.5 million; industrial-partner IBM Canada Ltd. is donating $2.5 million as well as the equivalent of $2.6 million in goods and services. For its part, the Université de Sherbrooke is contributing $1.16 million, in addition to the $340,000 from Prompt for the first two years of operation.

In addition to responding to the challenges facing the microelectronics industry, this Chair will serve as leverage in thoroughly training the next generation of scientists and businesspeople. Over the Chair's term, nearly 50 students will be trained to respond to future needs in this field. "By banking on the collaboration between IBM Canada and the Université de Sherbrooke, we are promoting the insertion of researchers into dynamic networks and contributing to the training of the next generation with the expertise to grow business competitiveness," pointed out Beauvais. Their training will take place in a unique collaborative environment constituted by MiQro Innovation Collaborative Centre (C2MI) and the Interdisciplinary Institute for Technological Innovation (3IT). C2MI, located in Bromont Scientific Park, has facilities at the cutting edge of technology for advanced packaging, operated and maintained by IBM engineers, thereby offering students unprecedented exposure to an industrial culture. Established in the Université de Sherbrooke's Parc innovation, 3IT has a complete array of nanomanufacturing and characterization tools to support the proposed research program.

NATIONWIDE SYMPOSIUM

The C2MI, in collaboration with CMC Microsystems and ITAC, held the nationwide Symposium *Innovation by Design*, the major annual gathering of the microsystems industry representatives in Canada. The two-day event took place in Lac Leamy, Hilton Hotel in Gatineau. The Symposium welcomed over 300 participants and allowed the electronic system industry to demonstrate his capacities to support and to develop technologies intended for the digital world.

The exhibitors took advantage of this opportunity to showcase their expertise and technologies.

The Symposium welcomed over 300 participants.

The chief executive officer of the C2MI addressing the participants at the closure session of the Symposium.

EVENTS 2014-2015

The C2MI must rapidly position itself among the World's leading Research Centers for the development of microsystems. Innovations and new products that are constantly and increasingly entering the market are proof of this. In order to promote its services, C2MI participates annually in trade shows as an exhibitor or as a guest speaker. During the year 2014-2015, C2MI participated or hosted the following events:

Networking activities

April 3, 2014	**Presentation of the C2MI to the members of the Fédération des chambres de commerce du Québec.** Symposium giving the opportunity for manufacturers to discuss issues and market trends, future challenges and solutions in key sectors of our economy.	fccq | Fédération des chambres de commerce du Québec
April 14, 2014	**École Polytechnique de Lausanne** Presentation and tour of the C2MI facility	EPFL ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE
April 23, 2014	**Université du Québec à Montréal** Presentation and tour of the C2MI facility	UQÀM
April 24, 2014	**Focus group** Empire State Development - NY	Empire State Development
May 21, 2014	**RCGT Lunch-conference** Facing the complexity of the case of property and casualty insurances, what are best practices?	Raymond Chabot Grant Thornton
July 7, 2014	**Session Chair** Emerging technologies - Grenoble	EMERGING TECHNOLOGIES
July 8 to 10, 2014	**Semicon West – Trade Show** The event attracts more than 30 000 professionals and leaders in the field of technology.	SEMICON West

August 21, 2014	**CNRC – PARI program**	
September 16, 2014	**Cité des objets connectés — France** The event includes approximately 20 companies including the French leader Éolane.	
October 6 to 7, 2014	**Annual Symposium C2MI-CMC** Gatineau, QC 300 participants	
November 5 to 7, 2014	**MIG Executive Congress – USA** Scottsdale, AZ	
December 19, 2014	**Cluster Mitacs**	
February 10, 2015	**Meeting with the Italian Heads Department for the economic development, the search and the industry.** Puglia Region, Italie	
March 9 to 10, 2015	**MIG Executive Congress – Europe** Copenhague, Danemark	
March 30 to 31, 2015	**Participation at the Congress of the Quebec Transportation Association**	

Workshops & seminars, training and community involvement

May 7, 2014	**La Petite Séduction Broadcast** Visit of the C2MI by the actress Anne Casabonne for La Petite Séduction TV show.	
May 28 to 29, 2014	**Metrology Symposium** The 11 workshops are organized by C2MI and CISEQ in collaboration with Hoskin Scientifique.	
July 9, 2014	**Participation in UMI/LN2 Symposium** Grenoble in France	
August 28, 2014	**DOW Corning Workshop** ToF SIMS	
September 25, 2014	120 students from Bromont elementary schools discovered different aspects of C2MI with interactive workshops presented by the researchers.	
October 5,2014	Opening of Bromont Scientific Park cycling path, a project involving C2MI.	
October 6, 2014	**Entretien Jacques-Cartier - Colloquium 9** Nanotechnologies: New paradigm associated with 3D integration.	
October 21, 2014	**Wallonia delegation** Interclustering Mission in Quebec	
November 4, 2014	**Discovery day – Elexpertise** Orientation Day for High School Students.	
November 13, 2014	**Dr. Maaike Taklo – SINTEF, Norway** Process integration and reliability of hermetic platelet level bonding for an infrared imager	
March 17, 2015	**Business Lunches – Elexpertise** Electrical and electronics workshops for college students.	
	The technologies developed at C2MI broadcast on Code Chastenay Show. This show explains science to a wide public. It addresses the scientific breakthroughs of Quebec while bringing researchers into light.	

C2MI
Reinventing Innovation

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