# ROI

## RETURN ON INNOVATION

Ontario Centres of Excellence
Annual Report **2009/2010**

Ontario Centres of Excellence

**Where Next Happens**

Ontario

Ontario Centres of Excellence (OCE) is funded by the Government of Ontario.

# The OCE Story

The Ontario Centres of Excellence (OCE) not-for-profit program was formally established in 1987 with seven independent centres that evolved and amalgamated into Ontario Centres of Excellence Inc. in 2004.

Twenty-three years ago, the traditional economic foundation for the province, and for Canada, was shifting from a North-American focused and commodities-based economy to one that is globally oriented and knowledge-based.

Prior to the creation of OCE, there was limited connection between universities, colleges, research hospitals and industry. Consensus was that these academic and research institutions were producing quality research that was not being utilized to its full potential by industry.

OCE was designed to bridge that gap and create productive working partnerships between university and college research departments, research hospitals and Ontario industry.

Today, OCE drives the commercialization of cutting-edge research across strategic market sectors to build the economy of tomorrow and secure Ontario's and Canada's global competitiveness. OCE focuses on areas and projects that will deliver not only the greatest economic benefits but those that will have positive social impact in communities across the province.

OCE fosters the training and development of the next generation of innovators and entrepreneurs and is a key partner with Ontario's industry, universities, colleges, research hospitals, investors and governments.

Through sector-focused centres, OCE works in areas such as communications and information technology, advanced health technologies, earth and environmental technologies, energy, materials and manufacturing and photonics. OCE is funded by the Government of Ontario, is a member of the Ontario Network of Excellence and is a key partner in delivering Ontario's Innovation Agenda.

OCE, through its Centre for Commercialization of Research (CCR) – an initiative financially supported by the federal government – also acts as a catalyst that allows innovative businesses to grow and achieve sustainable, commercial success and global competitiveness.

# What we do

Ontario Centres of Excellence (OCE) drives the development of Ontario's economy by helping create new jobs, products, services, technologies and businesses. In partnership with industry and academia, OCE invests to commercialize innovation originating in the province's colleges, universities and research hospitals. Over the 2009/2010 fiscal year OCE invested $25.8 million in 503 research, commercialization and talent projects and leveraged $40.1 million from industry partners.

# How we do it

The heart of OCE is its capability to work directly with academia and industry to bring prospective partners together to turn ideas into income. Together, they work through OCE's tailored programs to commercialize innovations, transfer technologies and develop promising talent.

OCE's Centre for Commercialization of Research, complements and extends OCE's research, talent and commercialization programs.

# Letter from the Chair

## Solid progress in a transitional year

**For Ontario Centres of Excellence, the 2009/2010 fiscal year has seen significant progress on a number of initiatives and programs in a very challenging time. You will become aware as you read through this annual report that OCE was successful in continuing to deliver on its mandate to generate a significant positive economic return on innovation that has its roots in Ontario's colleges, universities and research hospitals.**

OCE is an incredible resource to Ontario. More than that, it is viewed by people outside of Ontario and Canada, and has been over the years, as an organization at the forefront of commercializing innovation, enhancing the benefits the province derives from its multi-billion dollar investment in higher education.

It's certainly money well spent, as OCE understands the successful pursuit of innovation begins with the vision and ideas of the outstanding people in our academic community. Ontario's universities, colleges and research institutions are developing world-class ideas and concepts, technologies and systems that are being recognized and adopted globally. Without OCE, many good ideas that have been developed locally would have been commercialized elsewhere or else died on the "lab bench." By engaging our research institutions and making the critical connections with industry that move innovations forward, OCE propels our best research from ideas to income where they can create jobs, generate revenue and investment, and enhance our quality of life.

### Building success in Ontario

Since its founding in 1987, a key goal of OCE has been to ensure that Ontario secures the best return on our investment in the work of our research institutions. It is vital that we encourage our entrepreneurs and innovators to remain in Ontario where they can create their success stories and strengthen our culture of innovation.

The Ontario Government has recognized the importance of commercializing innovation and has been supportive of what OCE does and how crucial that will be to Ontario's future – recognition and support that is now mirrored by the Federal Government. Over the past few years innovation has become a major policy driver that is shaping Ontario's economy and will continue to do so for decades to come.

### Working as ONE

One major accomplishment over the course of the last year has been the completion of a new framework agreement with the province to define roles, responsibilities and accountability within the Ontario Network of Excellence (ONE), under which OCE delivers the Industry Academic Collaboration Program (IACP). ONE's objective is to improve the Ministry of Research and Innovation's ability to serve the needs of its researcher and entrepreneur clients with improved access to the full range of Ontario's support programs wherever they may be. Completing this agreement has required a significant share of the Board's time and management's attention and I am confident that OCE is positioned to move ahead productively.

With responsibility for the IACP, OCE has a solid mandate that offers tremendous potential and is fully consistent with our roots. It is also aligned with the business development skill sets that have been carefully built up over OCE's 23-year history.

We must ensure that every dollar we invest brings the very best return. The financial resources we bring to the task may seem small in comparison to the size of the challenge we face and the demand for our services, but that is the reality of innovation.

### Bringing stakeholders together

Nowhere is the abundance of Ontario's innovative community more evident than at Discovery, OCE's annual conference and showcase that brings ideas and opportunities together.

Despite the uncertainties of the economic climate in 2010, Discovery set new records for attendance, the number of exhibitors and event floor space. Discovery works because it brings leading stakeholders under one roof to exchange ideas and explore promising opportunities to work together. The dynamic created by working together to foster innovation is nothing short of amazing and suggests a promising future.

### Acknowledgements

We were very pleased to have Dr. Tom Corr join OCE as our new President and CEO in March. Tom has done an excellent job working with the Board of Directors in completing successfully the negotiation of our framework agreement with the Ministry of Research and Innovation and then in achieving the required internal restructuring to enable us to carry out our new mandate under the agreement. I would also like to thank our management and staff for their hard work and dedication through the past year of change.

One very sad note which occurred during this past year was the sudden death in May of Dr. Bob Moses who made a great contribution to the work of OCE. Dr. Moses had served as vice chair of our Board for the past five years and had been the chair of the board of one of our Centres for years before that.

Finally, I would like to thank the members of the Board of Directors who have brought remarkable skill and experience to the governance of OCE and have displayed tremendous dedication to OCE through this period of transition.

Throughout these pages you'll find further examples of how OCE is partnering with industry and academia to commercialize innovation. It's our commitment to Ontario and to its future.

**David F. McFadden**, Chair

# Letter from the CEO

## The vital work of investing in Ontario's tomorrow

**The theme of this year's annual report is "Return on Innovation." Given the uncertain economic times it has never been more important for Ontario Centres of Excellence to deliver tangible, positive returns on innovation to the people, economy and Province of Ontario. My principal objective as CEO is to maximize our team's ability to continue to find, develop and implement successful partnerships. That's where innovation starts to grow.**

For that reason we are placing even greater emphasis on research outcomes that will advance industry by turning great ideas into globally competitive products and services. That translates into jobs, into the creation of new technologies and new companies, and into sales revenues, which have concrete benefits.

More than just "new and improved," OCE seeks breakthrough investments with the potential to leapfrog current technologies and techniques. We're investing in people and ideas with the potential to generate jobs.

All of our investments are made with industry partners who are committed to matching, and in most cases exceeding, the initial funding provided by OCE. This is an incredible value for Ontario companies, providing them with the opportunity to develop top-tier intellectual property and to work with talented researchers who have access to unparalleled networks, equipment and resources. Such collaborations form lasting partnerships that drive industry research, empower companies, and help generate economic prosperity that benefits all Ontarians.

### Exploring opportunities

The real secret to what OCE does is our business development capability. Our business development specialists go out and literally explore the labs of academia. They ask "what's new?" They make it their business to maintain valuable contacts with leading Ontario companies in sectors including energy, communications and information technology, photonics, earth and environmental technologies, health, and manufacturing and they ask them, "what do you need?"

Putting academia and industry together to create a new product or technique is no easy task and requires the successful application of our specialized investment programs and the unique skill sets that reside within OCE. I've said before that industry can't ask for what it doesn't know about and that's where OCE comes in – we are the connector. And as the connector, OCE's business development model will be shifting to be more "industry-pulled" rather than "academia-pushed."

With this shift, we fully expect that from time to time a commercialization project, brokered and funded in part by an OCE investment program, results in a spark that creates an exciting and valuable new business. Someday it may become a global success story. We do the same with talented people. Ontario has an abundance of both and OCE is in the business of helping to grow more.

OCE has recently expanded its role and now frequently acts as a broker – identifying and facilitating investment transactions in which it has no direct financial stake of its own. OCE can be successful in this role, as its business development capability is founded on relationships more than transactions. As long as the ultimate objective is to drive the creation of technologies, companies, products and jobs for Ontario, OCE will be fulfilling its mandate and meeting the requirements of its provincial and federal funders.

### Leveraging the OCE model

Our approach to innovation here in Ontario is valued and applied elsewhere in Canada by other provinces and leveraged by the federal government in its sponsorship of OCE's Centre for Commercialization of Research, which builds on the OCE model and focuses on businesses.

Within the Ontario Network of Excellence – ONE – OCE is now the responsible partner in the Industry Academic Collaboration Program (IACP), so all of the research we fund originates in the province's colleges, universities and research hospitals.

Under OCE's responsibility for managing IACP, OCE is also focusing its business development activities more directly on the technology transfer offices in the colleges, universities and research hospitals, a natural "sweet spot" for this organization, given its strong roots in academia and its extensive track record.

This last year OCE invested $25.8 million in 503 projects that attracted $40.1 million invested by industry partners. Our projects involved 40 colleges, universities and research hospitals and connected researchers with 757 companies. Together, our activities resulted in the creation of 20 new start-up companies that attracted a further $113 million in capital investment.

The past year has seen significant transition at OCE due in part to ONE, the IACP and my own arrival at OCE. None of the success we have achieved over the past year would have been realized without the dedication and hard work of our amazing employees.

I want to acknowledge, too, the thoughtful direction, support and encouragement of OCE's Board of Directors. Our board members are volunteers who contribute their expertise and time – without financial compensation – for the benefit of the Province.

Collectively, we are dedicated to ensuring that Ontario-based innovation takes its rightful place in the global marketplace.

**Dr. Tom Corr**, President and CEO

# Delivering a Return on Innovation 2009/2010

**OCE invests in commercialization, technology transfer and talent development projects** in the segments of the economy that will drive Ontario's future prosperity and enhance global competitiveness. These segments encompass water, energy, advanced healthcare, nano technology, digital technology, communications and information technology, photonics and earth and environmental technologies.

- Invested **$25.8 million** in **503** research, commercialization and talent projects
- Leveraged **$40.1 million** investment from industry partners
- Enhanced the knowledge and skills of more than **4,330** researchers, students and private sector employees
- Engaged **461** researchers and co-investigators
- Involved **40** colleges, universities and research hospitals in OCE projects
- Connected researchers with **757** companies

- Moved **1,803** individuals from OCE-funded projects to positions in industry, government and academia
- Launched **20** start-up companies (**140** OCE-backed start-ups now active)
- Attracted capital investment totalling **$113 million** for OCE-backed start-up companies
- **9** patents granted with OCE support
- Submitted **84** patent applications with OCE support
- Established **36** new technology licences (**171** licences now active)

**503 projects include**

**96** Environmental Technologies

**70** Energy Technologies

**137** Communications & Information Technology

**17** Agriculture

**29** Life Sciences

**106** Materials & Manufacturing

**48** Advanced Health


Our team of business development specialists has 23 years of on-the-ground experience working with academia and industry. This kind of extensive coverage really sets OCE apart and it represents the foundation of our proven ability to create a positive return on innovation.

**Dr. Tom Corr**, President and CEO,
Ontario Centres of Excellence

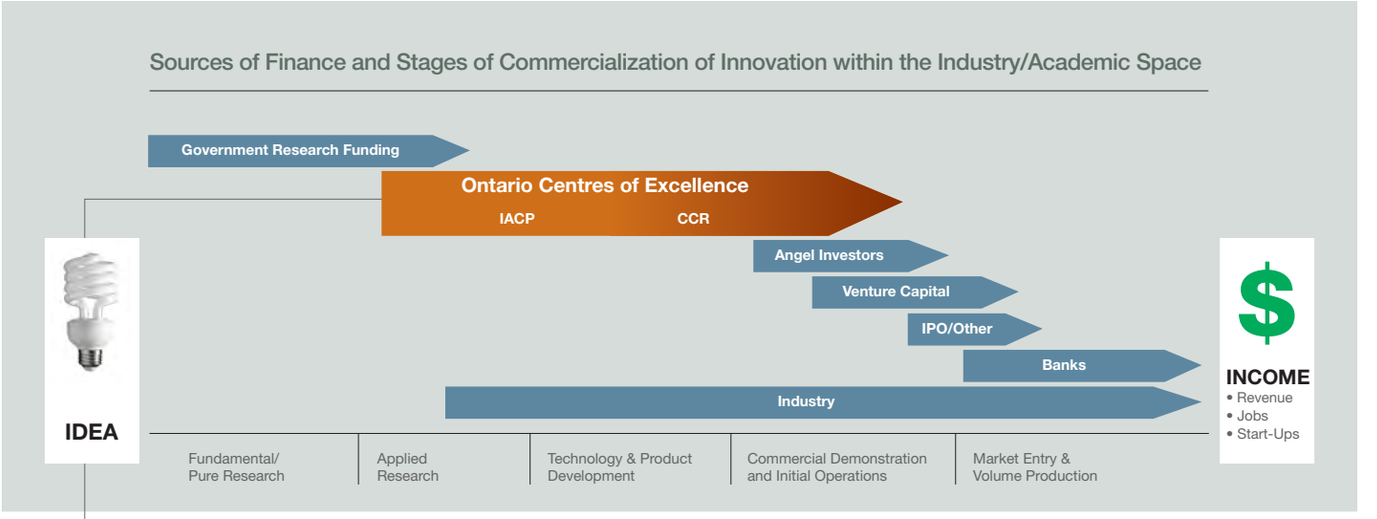
# Ontario Centres of Excellence (OCE) Programs

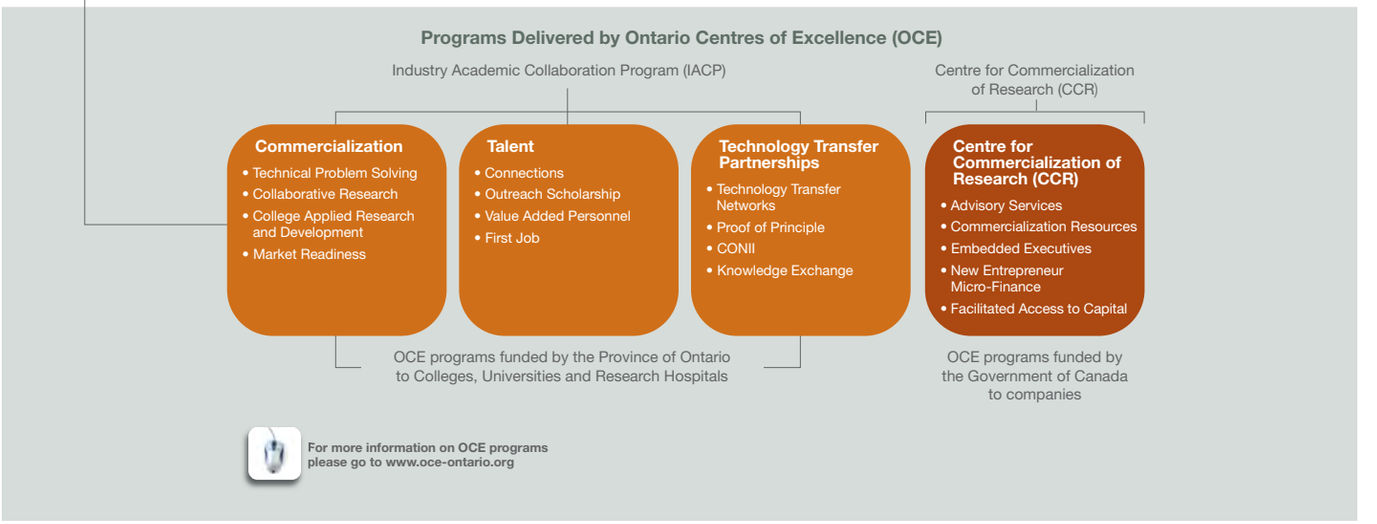
**In June 2009,** the Ontario Government introduced the Ontario Network of Excellence (ONE) – Ontario's new revitalized, client-focused, province-wide innovation network.

As part of ONE, OCE has been asked to administer the Industry Academic Collaboration Program (IACP). Funded by the Province of Ontario, IACP is designed to leverage the full capacity of Ontario's research institutions in order to help technology-based companies create jobs and prosperity by commercializing Ontario-based research discoveries.

Under IACP, OCE offers new programs that are responsive, flexible and adaptive to change, and better serve researchers, entrepreneurs and high-potential companies who have strong potential for commercial success.

OCE's Centre for Commercialization of Research (CCR), funded by the Government of Canada, further complements the IACP to span the full innovation continuum from research outcomes to sustainable market success.



## Industry Academic Collaboration Program (IACP)

The **Collaborative Commercialization** component of the IACP consists of four programs that support industry-academic collaborations.

- **Technical Problem Solving:** Supports select short-term projects and collaboration between industry and academia to build partnerships that yield commercial results and provide hands-on problem-solving experience.
- **Collaborative Research:** Designed for projects with special technical research challenges, demonstrated market pull, and high potential for commercialization.
- **College Applied Research and Development:** Supports collaborative projects between industry and colleges, building on the unique technical capabilities of Ontario's colleges.
- **Market Readiness:** Aids in moving promising technologies from the laboratory to a new spin-off company or licensing opportunity.

IACP's **Talent** component includes four programs that help Ontario's college and university students develop entrepreneurial and business skills.

- **Connections:** Partners engineering, science and technical program students with technology-based companies on real-world projects.
- **Value Added Personnel (VAP):** Bridges from the classroom to the workplace through entrepreneurship and business-skills training for Ontario students.
- **Outreach Scholarships:** Access to world-class, expert mentorship and peer interactions outside the province – within Canada and internationally – for Ontario's best research students.
- **First Job:** Salary-sharing to support Ontario companies who hire new graduates for R&D positions.

The **Technology Transfer Partnerships** component is delivered through four programs that support technology and knowledge transfer and proof-of-principle technology demonstrations.

- **Technology Transfer Networks:** Strengthens public research institution/industry linkages and collaboration and improves public research institution linkages to the local economy.
- **Institutional Proof of Principle (IPoP):** Funds public research institutions to advance research discoveries to market-ready inventions.
- **Colleges Ontario Network for Industry Innovation (CONII):** Strengthens the public college/industry links and collaboration and improves college links to the local economy.
- **Knowledge Exchange:** Promotes the exchange of knowledge and ideas between researchers and the wider economy; helps academia to understand marketplace realities.

## Centre for Commercialization of Research (CCR) Programs

- **Facilitated Access to Business Resources:** Advice and direct assistance to access a range of business services and resources including funding, market research, highly qualified people, professional services, industry networks, intellectual property management, training and other business needs.
- **Commercialization Resources:** Assistance and financial support to achieve a specific commercialization milestone enabling the company to advance its commercialization plan.
- **Embedded Executives:** Assistance and financial support to acquire the services of an experienced entrepreneur or business executive to work inside the company for a limited time as an embedded executive.
- **New Entrepreneur Micro-Finance:** Assistance and financial support to pre-incorporated and early-stage technology start-ups by providing young entrepreneurs with just enough capital to get an idea off the ground.
- **Facilitated Access to Capital:** Advice and assistance to determine the best financing options available to the company, and introductions to national and international investors through OCE's expanding network.

RETURN ON INNOVATION **OCE SUCCESS STORY**

# Atikokan Bio-Energy Research Centre

An aerial shot of the Atikokan Generating Station, located near the Town of Atikokan in Northwestern Ontario.

## Cleaner, renewable energy generation

The search for cleaner energy sources is ongoing, but innovation pays a huge return when part of the overall solution plays directly to an established strength. In its 2006 budget, the Ontario government set aside $4 million in funding to establish a bio-energy research program associated with Ontario Power Generation's Atikokan Generating Station in Atikokan, Ontario. OCE was tasked by the Ministry of Energy to co-ordinate and manage the research program. The overall goals of the initiative were to explore cleaner forms of electricity generation and to encourage economic opportunities in the North. The program included six inter-related projects, all aligned with cleaner electricity production:

- Using direct and indirect methods of co-firing forest biomass with coal
- Maximizing the economic benefit of using wood biomass in energy production
- Optimizing power plant combustion processes for co-fired biomass fuels
- Developing new technology to monitor mercury emissions
- Enhancing the capacity in Northwestern Ontario to develop a sustainable wood pellet industry
- Assessing the environmental impacts of peat as a potential energy source and examining the combustion of peat with coal

The program involved 29 professors from Lakehead University, Confederation College, University of Toronto, McMaster University, University of Western Ontario and Queen's University. They oversaw the work of 87 students.

The program also attracted 29 partner organizations, including the Town of Atikokan, industry and non-governmental organizations, which collectively contributed a further $4.5 million in cash and in-kind funding, including 23 personnel to work directly with the research teams.

*** RETURN ON INNOVATION**

- **200 Ontario jobs converting the plant to biomass**
- **20–25 Ontario jobs in wood pellet production**
- **Positions Ontario as a biomass energy leader**
- **Sustains jobs in Atikokan Generating Station, community and forest sector**
- **Progress on eliminating all Ontario coal-fired generation by 2014**

Atikokan was very excited about this project led by OCE and was pleased to be involved every step of the way. Seeing all the researchers attend meetings in Atikokan to present their findings was a very uplifting experience for our community. We feel the ABRC project was well worth it as it no doubt helped to prove the Atikokan Generating Station could continue to operate using wood pellets – something the entire community wants and needs.

**Dennis Brown**, Mayor
Town of Atikokan

* On August 26, 2010 the Ontario Government announced the conversion of the Atikokan Generating Station from coal to biomass, which will create up to 200 construction jobs and help protect jobs at the plant. It will also support an estimated 20 to 25 jobs in Ontario related to the production of wood pellets and sustain other jobs in the forestry sector.

RETURN ON INNOVATION **OCE SUCCESS STORY**

# OneChip Photonics Inc.

OneChip Photonics' Scott Kuntze, an optoelectronic device engineer, conducts photonic integrated circuit research at the company's headquarters in Ottawa.

## Delivering the potential of fibre optics

The global market for delivering fibre optic technology to the home, sometimes called Fibre-to-the-Home (FTTH) or the "final mile," is currently valued at $419 million, but that is expected to grow rapidly into the billions – growth that's likely to happen faster thanks to the work of Ottawa-based OneChip Photonics.

OneChip is the first company to develop fully integrated optical transceivers which transmit and receive data using optical fibre rather than electrical wire – for the Fibre-to-the-X (FTTX) market. OneChip develops low-cost, high-performance Photonic Integrated Circuit (PIC)-based Passive Optical Network (PON) transceivers. These transceivers will help communications network operators deploy FTTX more cost-effectively than before and meet consumer and business demand for high-bandwidth voice, data and video services.

OneChip's PIC-based optical transceivers are ushering in a new era in photonic integration. They integrate all the optical functions required for an optical transceiver onto a single, Indium Phosphide (InP)-based chip. This enables significant cost, quality, reliability and performance improvements over current transceiver designs, which offer low levels of integration and require manual assembly from multiple parts.

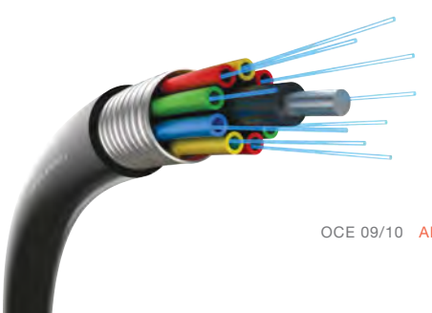
Building on OCE investments totalling $630,000 (in two programs: Market Readiness and Collaborative Research), OneChip has attracted follow-on investment from leading Canadian and U.S. venture capital specialists amounting to $39 million since 2006. The company is also a multiple award winner (2009 Deloitte Companies to Watch, 2010 *Ottawa Business Journal* Startups to Watch, among others, see back page of report).

**RETURN ON INNOVATION**

- **50 new jobs**
- **+ 50 additional new jobs over the next few years**

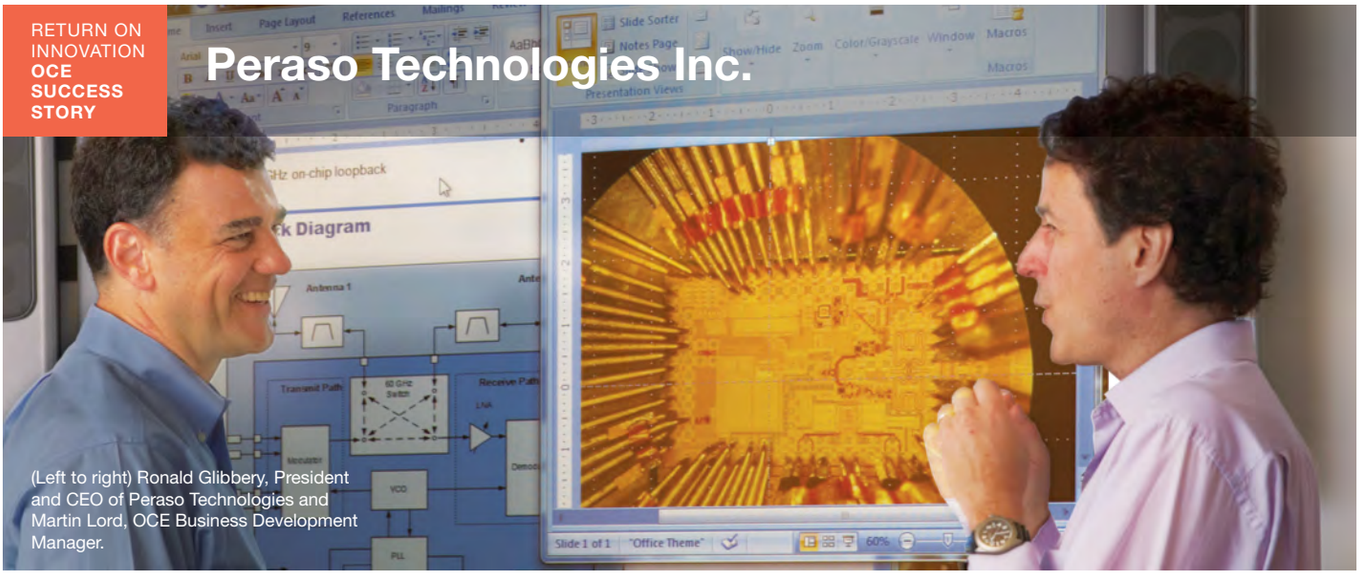
OCE has been a key partner in helping OneChip Photonics fund the development of our breakthrough technology and scale our operations. With OCE's support we are growing our business to be a leading global provider of optical communications components.

**Jim Hjartarson**, CEO
OneChip Photonics Inc.



RETURN ON INNOVATION
**OCE SUCCESS STORY**

# Peraso Technologies Inc.



(Left to right) Ronald Glibbery, President and CEO of Peraso Technologies and Martin Lord, OCE Business Development Manager.

## Speeding content delivery to mobile devices

Peraso Technologies is a Toronto-based semiconductor company specializing in the development of single-chip millimetre-wave (mmwave) transceivers that accelerate the delivery of content to portable devices, such as BlackBerry Smartphones, iPhones and other smart phones.

OCE invested $90,000 in the firm's early development, through its Market Readiness and First Job programs. That investment in innovation paid off when it came time to raise capital from more sophisticated partners with the company recently securing $10 million in follow-on investment from a group of leading Canadian and U.S. venture capital firms.

"Peraso's team has proven start-up experience including commercial success in communication networking devices," said Brian Antonen, Partner in Celtic House, a new investor. That sentiment was echoed by Jim Whitaker, Managing Partner at VentureLink Funds: "The Peraso team has a real feel for the financial metrics necessary to establish a successful technology venture. The efficient use of capital is critical in an emerging technology start-up."

Peraso is developing wireless integrated circuits (ICs) targeted for mobile markets such as smartphones, tablet computers and laptops and similar "wireless local area network" applications. The company's products are compatible with emerging 60 GHz standards which enable data transmission rates at least 10 times faster than those currently available for consumer product use. The 60 GHz band has previously been used for communication between satellites in space, and it has a number of additional technical advantages, including reduced congestion and comparatively low-cost radio construction through the use of complementary metal-oxide-semiconductor (CMOS) technology – which enables aggressive pricing – as well as a small footprint and low power consumption.

Peraso's first products target the mobile consumer electronics market. The enormous bandwidth means scope of use cases for 60 GHz devices are almost limitless, including:

- Mobile rapid Sync 'n' Go
- Desktop interconnect (i.e., USB cable replacement)
- Next generation wireless networking
- In-room HD video streaming – particularly for home-theatre applications where use of a cable is impractical
- Cellular backhaul – that is, the link between a single cell phone tower and the carrier's core network, and
- Last-mile wireless links

Additional mmwave applications include advanced medical and security imaging, vehicle-to-vehicle communication, and IC-to-IC links.

With funding from OCE's Collaborative Research program the company is partnering with the University of Toronto in further development of its technology.

**RETURN ON INNOVATION**

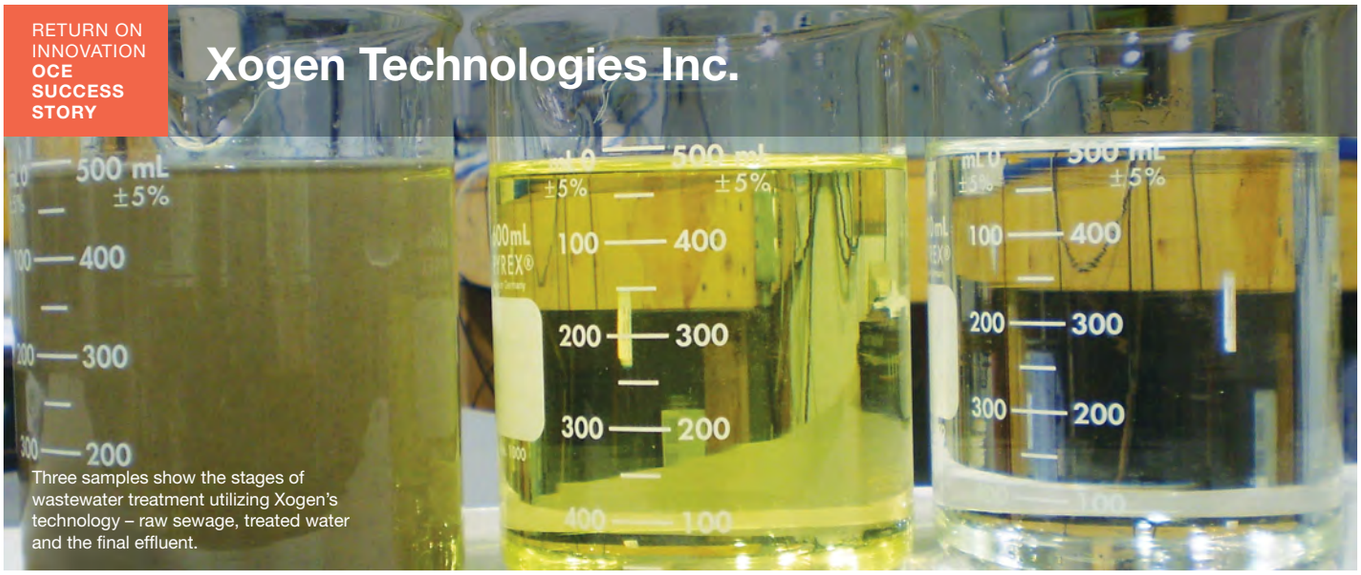
- **12 new jobs**
- **+ 20 new jobs by 2011 (when 90% of staff will be PhDs)**
- **$100 million in sales by 2015**

OCE's financial support, through the Market Readiness Program, was invaluable in helping Peraso develop the hard market facts necessary to support our business plan and build credibility among investors.

**Ronald Glibbery**, President and CEO
Peraso Technologies Inc.

RETURN ON INNOVATION
**OCE SUCCESS STORY**

# Xogen Technologies Inc.




Three samples show the stages of wastewater treatment utilizing Xogen's technology – raw sewage, treated water and the final effluent.

## Reducing the cost of wastewater treatment

Water is essential for life and, although much of the world's surface is covered with water, only a fraction is available as potable water for human consumption. Beyond being an essential for everyday life, water is equally essential for economic health, and the quality, scarcity and safety of water are increasingly challenging for municipalities and industry alike.

Xogen Technologies Inc. is a cleantech company located in Orangeville, Ontario, whose electrolytic technology has the potential to revolutionize wastewater treatment by reducing the footprint of treatment plants, reducing conventional processes and eliminating biosolids. At the same time, its process produces hydrogen oxygen gas as a by-product with economic value through re-use or the generation of energy.

During technology development, Xogen turned to academic researchers to assist with questions related to reactions important for destruction of contaminants, novel electrode materials and power electronics. OCE invested approximately $290,000 over a three-year period through its Interact/Collaborative Research Program, to enable Xogen and researchers at the University of Toronto to uncover the technology's full commercial potential and to move it out of the lab and towards commercial scale.

Since 1998, the company has invested more than $13 million developing its technology, which is now protected by 22 patents, with another 11 pending.

Now, Xogen is taking a further step towards commercialization by building a wastewater treatment demonstration plant within Orangeville's water pollution control plant, targeting start-up in October 2010. The pilot plant occupies approximately 70 square metres and will process close to 20 litres per minute, or about 28,400 litres per day, with the treated water flowing back into the plant's head works.

With its new technology delivering performance superior to conventional water treatment methods, as well as significantly reduced total cost of ownership, Xogen is receiving widespread market interest, including inquiries from as far away as Malaysia, suggesting an exciting and profitable growth trajectory ahead.

**RETURN ON INNOVATION**

- **15 new jobs by 2013**

> Without OCE's funding and the university relationship, it would have taken Xogen much longer to advance its technology towards commercialization.
>
> **Angella Hughes**, CEO
> Xogen Technologies Inc.

RETURN ON INNOVATION **OCE SUCCESS STORY**

# P&P Optica Inc.

P&P Optica's spectrometers – attached to a camera (left) and attached to a fibre optic cable.

## Quicker, less costly blood analyses

In healthcare, the return on innovation generated by delivering vital test results both faster and at significantly lower cost saves valuable financial resources that can be applied elsewhere to benefit all healthcare consumers.

Kitchener-based P&P Optica Inc. has developed innovative optical spectrometer technology – sophisticated instruments that use light to analyze and report on the chemical compounds in blood, such as iron, glucose and cholesterol. P&P Optica's technology greatly accelerates completion of routine tests and reduces costs up to 70 per cent, so the potential savings for the healthcare sector are enormous.

P&P Optica's spectrometry technology can be used in doctors' offices, clinics and emergency rooms. "This technology can be used in any medical facility where near-instant blood analysis is an advantage or a necessity," said Olga Pawluczyk, President. This new technology eliminates the need for expensive chemicals, previously required to identify targeted substances. It's also superior to current technology, as one vial of sample blood can be used for multiple tests. "You take a sample, stick it in the machine and out come multiple results," Pawluczyk added.

OCE invested $95,000 through its Interact/Collaborative Research programs to help P&P Optica develop its technology through partnerships with the University of Waterloo and the University of Toronto.

This was followed by OCE's Centre for Commercialization of Research (CCR) seeking to match the company with a Vice President of Sales and Marketing to help capture new markets through its Embedded Executive Program.

"OCE and its CCR are probably our most valuable resources," said Pawluczyk, "linking us with people in the industry and connecting us to their networks of experts in their respective fields. These connections were instrumental in formulating business strategy."

In April 2010, P&P Optica was awarded a $1.3 million federal government loan to help the company expand and pursue global market opportunities.

**RETURN ON INNOVATION**

- 9 new jobs by 2011
- + 9 new jobs by 2012
- + 23 new jobs by 2015

OCE has been providing invaluable guidance. If we have a question that needs to be addressed quickly, we just pick up the phone and call one of our contacts there. They always point us to the right person.

**Olga Pawluczyk**, President
P&P Optica Inc.

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**OCE SUCCESS STORY**

# REGEN Energy Inc.


Tim Angus, CEO of REGEN Energy, talks with Greg Fitzgerald, OCE's Regional Commercialization Director, at the GE Digital Energy headquarters in Markham, Ontario.

## Enabling wireless electricity conservation

Electricity is a valuable resource, but one whose use – and therefore cost – has to be managed carefully. Large industrial and commercial users in Ontario are billed according to their peak demand (over a 15-minute period). For a typical industrial building of 90,000 square feet, peak demand could amount to 500 kW, with a corresponding bill.

With financial support from OCE, Toronto-based REGEN Energy has developed wireless radio controllers installed on heaters, pumps, air conditioners and other equipment that draw significant electrical loads. The controllers "talk" to each other wirelessly, telling each system when to operate or shut down briefly during peak periods. These conversations can reduce peak electricity demand for a typical industrial facility by 30 per cent, a potentially huge saving when multiplied across thousands of industrial and commercial facilities across the province or across Canada.

OCE's first involvement with REGEN was to recommend working with researchers at Centennial College to test the controllers on commercial buildings. That research demonstrated to potential investors that REGEN's patent-pending technology had significant commercial potential. Centennial's research also showed that under certain conditions the controllers could significantly reduce overall power consumption.

OCE's Centre for Commercialization of Research later connected REGEN with a new CEO, Tim Angus, through its Embedded Executive Program.

REGEN has since completed a successful equity financing, in which CCR participated, and has increased sales revenues by more than 15 times over last year. Ultimately, REGEN's controllers could be rolled out in commercial and industrial facilities across North America as well as, eventually, in household appliances and pool pumps.

**RETURN ON INNOVATION**

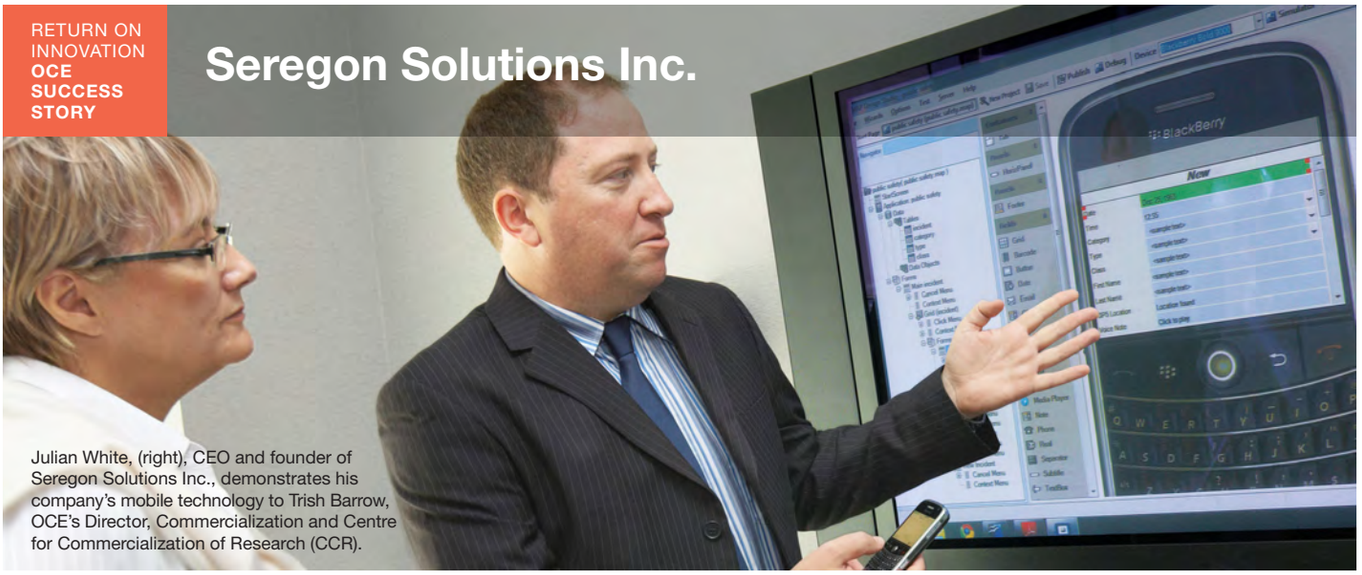
- **15–30 new jobs by 2013**

OCE's CCR financial support helped REGEN by providing essential funding at a critical time to execute key corporate development initiatives. CCR is an ideal partner for a company at REGEN's stage.

**Tim Angus**, CEO
REGEN Energy Inc.

RETURN ON INNOVATION
**OCE SUCCESS STORY**

# Seregon Solutions Inc.



Julian White, (right), CEO and founder of Seregon Solutions Inc., demonstrates his company's mobile technology to Trish Barrow, OCE's Director, Commercialization and Centre for Commercialization of Research (CCR).

## Enterprise solutions to enhance mobile worker performance

The world is going mobile because the benefits are clear – mobile enterprise solutions empower mobile field workers to increase revenue generation, reduce costs and improve their performance through timeliness and accuracy of information.

According to International Data Corporation (IDC), "Fuelled by the explosive growth of cellular networks and handheld devices, the worldwide mobile enterprise application market will boom at double-digit rates, reaching $3.5 billion in 2010."

Seregon Solutions Inc., an Ottawa-based provider of mobile enterprise application platform (MEAP) software provides robust, economical solutions for enterprise mobility. The company's team specializes in development of enterprise applications for BlackBerry, Android, Windows Mobile, Symbian and iPhone mobile systems and synchronizes all backend systems and databases.

The company has demonstrated success in field force management (work request order management and inventory management) as well as public safety and industrial security applications, notably a 300-officer pilot program with the North Wales Police, using the BlackBerry platform to exchange dispatch notices, incident reports and other details.

With the technology proven, OCE's Centre for Commercialization of Research (CCR) helped Seregon boost its personnel, through CCR's popular Embedded Executive Program – a key piece of the puzzle according to company founder and CEO, Julian White.

"OCE's CCR provided funding to expand our executive team, including helping to bring in the company's Chief Financial Officer," said White. "This was key to raising more external investment. CCR also invested in our company, the money being used to take our product to market," he added.

CCR's $200,000 investment in Seregon will also help accelerate the growth of its technology, helping position them for further investment by angel investors and VCs and accelerate its current growth strategy in the enterprise mobility market.

**RETURN ON INNOVATION**

- **10 new jobs since 2006**

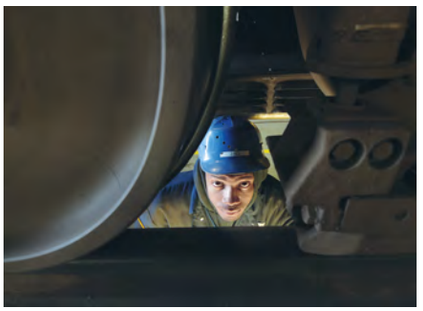
OCE's CCR helped us expand our executive team and was a key resource in helping us commercialize our product. They were able to do this quickly, without a long-winded bureaucratic process.

**Julian White**, CEO and Founder
Seregon Solutions Inc.

# Working with industry

## Maintaining a competitive edge through OCE-backed R&D

While OCE's investments often target innovation emerging from labs and start-up companies, established companies often leverage our programs to help advance new technologies to commercialization, to help maintain their competitive edge.



### Bombardier Transportation

Track level transit workers may soon benefit from improved job safety through research by Bombardier Transportation and the McMaster RFID (radio frequency identification) Applications Lab, supported by a three-year $600,000 investment by OCE.

The new concept equips track workers with RFID tags in a Real Time Location System (RTLS), to give transit operators and controllers a precise visual read-out of workers' locations. The system, called TrackSafe, has already garnered interest from a potential lead customer which is participating in the development program.

TrackSafe will deliver significant improvements to the safety of rail maintenance personnel in the dangerous daily work at track level of operational rail and transit systems.

**RETURN ON INNOVATION**

- **20–40 projected new jobs**


### Ferrero Inc.

Ferrero Inc., the manufacturer of Ferrero Rocher chocolates and Nutella spread, is working with the University of Guelph and OCE to cultivate locally grown hazelnuts that could replace part of the hazelnuts used at the company's Brantford, Ontario plant.

Guelph's Prof. Adam Dale said that using locally grown hazelnuts to replace imports – a seven-year process – would return at least 1,000 area farms to productivity and create additional benefits for local equipment suppliers and service businesses and in using hazelnut shells in the manufacture of other products.

**RETURN ON INNOVATION**

- **Potential for new job creation in the region**

### Trojan Technologies

London, Ontario-based Trojan Technologies is the global leader in residential, industrial and municipal ultraviolet (UV) wastewater disinfection, with more than 6,000 installations, including New York City's municipal system, and more than $200 million in annual sales.

OCE has partnered Trojan's technology development with five Ontario universities over 15-plus years and its chief scientist participates in OCE's Water Advisory Committee, among other initiatives.

Through such collaborations, Trojan maintains its competitive edge by accelerating innovation and diversifying the technologies it commercializes.

**RETURN ON INNOVATION**

- **Helping maintain the competitive edge of a global leader**

# Investing in the next generation of innovators

**LifeLike BioTissue Inc.**
Medical Devices

With an investment of $100,000 from OCE (OCE's Martin Walmsley Fellowship for Technological Entrepreneurship), Dr. Leonardo Millon (PhD in biomedical engineering) is leading a team developing synthetic human tissue to be used for surgical practice and training. The proprietary synthetic tissue mimics soft human tissue and is formed into anatomic models of the aorta, veins, coronary arteries and other tissues and organs. LifeLike BioTissue phantoms give surgeons realistic experience, without the medical, ethical and legal risks of operating on live patients. Ultimately, the new material may be used to enhance surgical training worldwide.

**University of Western Ontario**
Solar Energy

A research group led by the University of Western Ontario's Dr. Rajiv Varma, along with participants from the University of Waterloo, is working with a $3 million investment from OCE in the development of pioneering technologies for the integration of photovoltaic (PV) solar farms into Ontario's electricity transmission and distribution networks. More specifically, the work is aimed at low-cost strategies to improve grid voltages and voltage control.

London Hydro and Sarnia, Ontario-based Bluewater Power will be implementing the technology on two 10 kW PV networks. Additional corporate support is being provided by the Ontario Power Authority, Hydro One and First Solar Canada. Conducted at one of the largest solar farms in the world, this research will help give solar farms the ability to act as an energy storage device at night.

**PowerStream**
Geothermal Energy

PowerStream, the second largest municipally owned electricity distributor in Ontario, serves more than 300,000 residential and business customers in York Region and Simcoe County, north of Toronto.

Four university student teams worked with PowerStream under OCE's Connections Program. One extraordinary project team from Queen's University conducted analyses and designed a preliminary feasibility tool (currently in use) for evaluating the geothermal potential of commercial sites and estate housing within PowerStream's service territory.

"This geothermal tool provides immediate tangible value to PowerStream. The program was a classic win-win…we encourage others to explore participating with OCE," said Mark Henderson, PowerStream's EVP Asset Management and Chief Operating Officer.

While **the aim of OCE financial investment** is to advance the development of technologies into commercial products and employment, the organization also supports high-potential early-stage projects, where the expected return on innovation is significant.

# and ideas

**Spongelab Interactive**
Computer Game Technology in Education

Spongelab is committed to advancing the use of technology in education and becoming a leader in applying computer game technology for teaching. Under OCE's First Job Program, funding of $48,000, Spongelab employed Nicole Husain (PhD cell biology, University of Toronto) in the development of new products, including the content for Genomics Digital Lab. Husain wrote descriptions for animations for each lesson, as well as advanced case studies, explanatory content on biological molecule functions, and performed quality assurance and testing functions.

Husain was hired by Spongelab as a permanent project manager in February 2010, one year after her First Job assignment.


**Algonquin College**
B-Con Engineering/ Photonics

In April 2010, B-Con Engineering signed a landmark agreement to license innovative optical lens technology (first ever patent for Algonquin College) developed by Dr. Ilya Golub of Algonquin College and his partner Dr. Brahim Chebbi, now with Laurentian University, with $113,500 in financial support from OCE.

The new lens provides light over a large area more uniformly and intensely than current technologies and has applications in medical diagnostics and civic illumination markets.

"This partnership with Algonquin College… helped us to break into high technology markets we could not address in the past, as well as to differentiate our future products," said Brian Creber, President of B-Con.

**CheckSpectra**
Photonics

OCE's Connections program enhances the employment prospects of Ontario final-year college and university students by having them work on "real world" technology challenges in partnership with industry.

Niagara College paired photonics engineering technology student Shawn Kafal with CheckSpectra, a London-based fluid analysis company, working on microscopic laser-induced breakdown spectroscopy (Micro LIBS), to detect impurities in heavy vehicle engine oil.

Shawn's work on a prototype on-site oil analysis instrument, which reduces analysis cost and turnaround time from days to just a few hours – a potentially enormous saving in reduced engine damage for equipment operators – earned him a full-time contract position at Niagara College.


# Bringing stakeholders together makes things happen

Discovery™
Ontario Centres of Excellence

**Great things happen when people with great ideas get together face-to-face, and OCE actively promotes this game-changing communication through a variety of events and programs throughout the province.**

Now in its fifth year, OCE's Discovery conference is Canada's largest innovation and commercialization event. Discovery brings together the key players from industry, academia and government, as well as entrepreneurs, the investment community and students. This year's event in Toronto, May 17 and 18, 2010, occupied 200,000 square feet of exhibition space and attracted more than 325 exhibitors and almost 2,500 attendees. Beyond the basic numbers, "Discovery brings together the players who drive new technologies to market," said Dr. Tom Corr, OCE President and CEO.

Why is Discovery important? It works. Among those who exhibited, more than 40 per cent found a potential business

> I saw some exhibits out here and I think, Oh my gosh, I can absolutely see this applied in the future.
>
> **Steve Wozniak**, Apple co-founder and keynote speaker at Discovery 2010

Discovery™
Ontario Centres of Excellence

**HIGHLIGHTS FROM DISCOVERY 2010**

**Keynote:** Steve Wozniak, co-founder of Apple

- **The Elevator Pitch – Innovative ideas in a moment**
- **Ontario's Next Top Young Entrepreneur Start-up Pitch**
- **Sector Zones – Exhibits and experts in cleantech, manufacturing, advanced health technologies, digital media and more**
- **Zerofootprint Building Re-skinning – New life for old buildings**
- **International Café – Advice from Canadian trade commissioners and economic officers**
- **Premier's Innovation Awards**

**SAVE THE DATE:**
**DISCOVERY 2011 MAY 18 & 19, 2011**
**www.ocediscovery.com**

Discovery offers a different environment, where the mandate is to share ideas. I left the show with more real world opportunities than any typical trade show. Months after the show, I am still sorting through the opportunities.

**Mike Laurie**, P.Eng, President, PLANiT MEASURING

partner, and almost two thirds met a businessperson or investor who expressed interest in their business, product or service. The space was arranged in four sector zones reflecting the most exciting areas: advanced health; clean tech; digital; and manufacturing.

Discovery 2010 was also the forum for announcing the Premier's Innovation Awards, recognition for world-class innovators, those whose work is shaping our world and inventing Ontario's economic future.

"Innovation is life and this conference is unique," said David McFadden, Chair, OCE Board of Directors. "Just come to Discovery and you'll see how bright the future's going to be."

## MIND TO MARKET INNOVATION SERIES

### Mind to Market Innovation Series

OCE brings together some of Ontario's leading thinkers in an ongoing series of panel events that set the tone for tomorrow. The events provide an early taste of the future and a look at where and how "next" is happening, as innovative science and technologies move from laboratories into industry, heading for profitable new businesses that will drive Ontario's economy.

Mind to Market Innovation series events in 2009/2010 included:

- Guelph – "Innovative communities for a sustainable world," featuring Canadian astronaut Dr. Bob Thirsk and Karen Farbridge, Mayor of Guelph
- Toronto – "The Smart Grid: Building a global advantage for Ontario," with David McFadden, Chair, Ontario Smart Grid Forum and Chair, Ontario Centres of Excellence; Larry A. Sollecito, President and CEO, GE Digital Energy; Wade Malcolm, Managing Director, Accenture's North American SmartGrid Practice; David Collie, President and CEO, Burlington Hydro Electric Inc.
- Ottawa – "The Value of International Collaboration with Canadian Leaders," featuring Dr. Thirumalachari Ramasami, Secretary to the Government of India, Department of Science and Technology *(organized jointly by OCE and ISTPCanada)*

# Ontario Centres of Excellence Governance

## Board of Directors 2009/2010

**David J. McFadden**, Q.C. (Chair)
Chair, Gowlings International
Gowling Lafleur Henderson LLP

**Dr. Suhayya Abu-Hakima**
President and CEO
Amika Mobile Corporation

**Dr. Peter Annan**
President
Sensors & Software Inc.

**Mark Chamberlain**
President and CEO
Trivaris Ltd.

**Sean Conway**
Acting Vice-Principal (Advancement),
Special Advisor to the
Principal (External Relations)
and Fellow, School of Policy Studies
Queen's University

**Dr. Robert Gillett**
President
Algonquin College

**Dr. David Johnston**
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University of Waterloo

**Colin Kelleher**
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Kelleher Financial Inc.

**Dr. Hadi Mahabadi**
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Xerox Research Centre of Canada

**William J. McClean**
Corporate Director

**Dr. Robert Moses** (Vice Chair)
President and CEO
PCI Enterprises Inc.
(passed away May 2010)

**Dr. Jayson Myers**
President
Canadian Manufacturers and
Exporters

**Michael J. Nobrega**
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OMERS

**Dr. Gilles G. Patry**
Professor and President Emeritus
University of Ottawa

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Professor, Chemical Engineering &
Applied Chemistry
University of Toronto

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**Dr. Ian C.P. Smith**
Director General
Institute for Biodiagnostics
National Research Council Canada

**Jeffrey Steiner** (Secretary)
Principal
GPEX Capital Ltd.

**Dr. Tom Corr** (ex-officio)
President and CEO
Ontario Centres of Excellence

## Observers

**George Ross**
Deputy Minister
Ontario Ministry of Research and
Innovation
Deputy Minister
Ontario Ministry of Consumer
Services

**Christian Thivierge**
Deputy Program Director
Networks of Centres of Excellence

## Executive Team

**Dr. Tom Corr**
President and CEO

**Bob Civak**
Senior Vice President
Business Development Operations

**Dr. Mario Thomas**
Senior Vice President
Centres of Excellence

**William Ballios**
Vice President
Finance and Administration

**David Choat**
Vice President
Human Resources

**Anne Wettlaufer**
Vice President
Marketing and Communications

Ontario Centres of Excellence (OCE) Inc. is a member of the Institute of Corporate Directors (ICD).

INSTITUTE OF CORPORATE DIRECTORS
INSTITUT DES ADMINISTRATEURS DE SOCIÉTÉS

Ontario Centres of Excellence (OCE) promotes a healthy workplace, which is key to well-being and, by extension, innovation.

Healthy Workplace

DESIGN: BRYAN MILLS IRADESSO WWW.BMIR.COM TORONTO

For more information visit

www.oce-ontario.org

Ontario Centres of Excellence

Where Next Happens

ontario network of excellence

OCE is a member of the Ontario Network of Excellence (ONE).

# Ontario Centres of Excellence (OCE) is proud to have worked with and supported these award-winning companies.

**Aeryon Labs**

2009 TiEQuest First Place Winner

2009 AlwaysOn OnDC Top 100 Winner

2009 The Canadian Innovation Exchange (CIX) Top 20 Innovative Companies of 2009

2009 Branham 300 Top 25 Up and Coming ICT Companies

2009 Deloitte Companies-to-Watch Award

**Arise Technologies**

2009 Deloitte Canadian Technology Fast 50™ list

2009 Deloitte Technology Fast 500™ ranked 103

2010 Deloitte Canadian Technology Fast 50™ list

**Attodyne Inc.**

2010 TiEQuest Business Venture Competition, Best Clean Tech Award

2010 TiEQuest Business Venture Competition 2nd Place Winner

**Benbria**

2009 Technology Marketing Corporation (TMC) 2009 INTERNET TELEPHONY Excellence Award

2010 PROFIT HOT 50 Canada's Emerging Growth Companies (rank 11th)

2010 Branham Group Top 25 Canadian Up and Coming Information and Communications Technology Companies

2010 *Ottawa Business Journal* Top 10 Start-ups to Watch

**BTI Systems**

2009 OCRI Award, Financial Deal of the Year

2009 Deloitte Canadian Technology Fast 50™ list

2009 Deloitte Technology Fast 500™ ranked 171

**Cast Connex**

2009 Award for Excellence in Innovation in Civil Engineering, Canadian Society for Civil Engineering

**Desire2Learn Incorporated**

2009 Deloitte Canadian Technology Fast 50™ list

2009 Waterloo Region Business Achievement Award, KPMG Excellence in Technology Award

2009 AMCP MarCom Platinum Award

2009 USDLA 21st Century Best Practice Distance Learning Award

**DragonWave Inc.**

2009 Deloitte Canadian Technology Fast 50™ list

2009 Deloitte Technology Fast 500™ ranked 118

2009 Best 4G Enabling Technology Innovation, *xchange* magazine

2010 Ottawa Company of the Year Award, Ottawa Centre for Research and Innovation

2010 Deloitte Canadian Technology Fast 50™ list

**EcoVu Analytics**

2009 EBJ Business Achievement Awards – Technology Merit: Water/Wastewater

2009 IEEE Ottawa Section – Outstanding Technology Company Award

**EION Wireless**

2009 WiMAX Distinction Award

2009 Deloitte Canadian Technology Fast list 50™ list

2009 Communication Solutions Product of the Year Award from Technology Marketing Corporation (TMC)

2009 Deloitte Technology Fast 500™ ranked 360

2010 Deloitte Canadian Technology Fast 50™ list

**LifeLike BioTissue**

2010 TiEQuest Business Venture Competition, HTX Best Healthcare Industry Award

**Miovision Technologies Inc.**

2009 Phil Lapp Award for Excellence, GEOIDE

**NexJ Systems**

2010 Deloitte Canadian Technology Fast 50™ list

**OneChip Photonics**

2009 Deloitte Companies-to-Watch Award

2009 IEEE Ottawa Section Outstanding Technology Company Award

2009 Prism Awards Finalist: Optics Category

2010 *Ottawa Business Journal* Startups to Watch

2010 Photonics Spectra's Startups to Watch

**Panacis**

2010 *PROFIT* magazine – Canada's 100 Fastest Growing Companies (rank 22nd)

**Polar Mobile**

2009 Branham 300: Top 25 Canadian ICT Up and Comers

2009 Canadian New Media Awards Finalist

2010 Ten Canadian Mobile and Wireless Companies to Watch, IDC

2010 Deloitte Companies-to-Watch Award

**PlantForm Corporation**

2009 Canada's Top 10 Companies winner, Life Sciences category

**Profound Medical**

2009 Canada's Top 10 Companies winner, Life Sciences category

2010 TiEQuest Business Venture Competition – OCE Award for Best Intellectual Property

2010 TiEQuest Business Venture Competition – Best-in-Class Award for Healthcare and Life Sciences

2010 Ontario Premier's Catalyst Award Recipient for Start-up Company with the Best Innovation

**Quantum Dental Technologies**

2010 National Instrument's Graphical System Design and Achievement Award

**Seregon Solutions Inc.**

2010 Ten Canadian Mobile and Wireless Companies to Watch, IDC

**Skymeter**

2009 The Canadian Innovation Exchange (CIX) Top 20 Innovative Companies

2009 Cleantech Next 10 Leaders of Tomorrow, *Corporate Knights* magazine

2010 Intertraffic Innovation Award Overall Winner, Intertraffic Amsterdam

**Spartan Bioscience**

2010 Canadian Advanced Technology Alliance (CATA) Award for Outstanding Product Achievement in the ICT/Health Sector

2010 Ontario Premier's Catalyst Award Recipient for Best Young Innovator

**Spongelab Interactive**

2009 United Nations World Summit Award

2009 National Science Foundation Science and Engineering Visualization Challenge, First Place

2009 Parents' Choice Award – Silver Honour

2009 Adobe Max Award

**Vive Nano**

2009 Deloitte Canadian Technology Green 15™ Awards

2009 Cleantech Next 10 Leaders of Tomorrow, *Corporate Knights* magazine

2009 Winner, Clean 15 Clean Technology Competition, *Canadian Business Magazine*

2010 Frost & Sullivan North American Technology of the Year Award

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Ontario Centres of Excellence

Where Next Happens

Ontario

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