

ONTARIO *INNOVATES*



Ministry of Research and Innovation

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Fast to innovate. Fast to build. Fast to market.

*A message from
Premier Dalton
McGuinty, Minister
of Research and
Innovation*

Welcome to our very first issue of *Ontario Innovates*!

We're living in an exciting era where ideas are springing to life faster than we can blink. Ideas like micro-imaging tools that can scan mice the way ultrasound machines scan humans. Or holographic advertising that brings posters to life. Or radio frequency identification technology that uses radio waves to automatically identify objects and people. These are just a few of the many creative new ideas conceived right here in the province we call home — ideas that will help keep us in the lead in the innovation race.

Our province has long been a springboard for innovation in the world. Consider our groundbreaking inventions with insulin, the first regulated pacemaker and, more recently, the BlackBerry. All have changed the quality of life for people everywhere. But, despite these success stories, we can't afford to be complacent.

In today's hyper-competitive global economy, it's not about the big overtaking the small. It's about the fast overtaking the slow. Organizations that move ideas to the marketplace fastest will be the economic leaders of tomorrow. That's why our government is bringing a unified approach to innovation.



For the first time ever, there's a consensus among business, labour and government on what we need to do: merge the brilliance of inventors, the financial strength of investors, the courage of entrepreneurs and the legislative powers of all levels of government.

To make that happen we need to begin a dialogue between these parties, a dialogue where ideas are shared, breakthroughs are celebrated and concerns are addressed. And *Ontario Innovates* is one forum our government is providing to ensure that conversation continues. We envision an even stronger and more prosperous Ontario, but we know it's going to take fresh ideas, investment and courage — and, for that, we need you.

Ontario Innovates will be published quarterly and will be available at www.ontario.ca/innovation. We invite your feedback on our inaugural issue — and welcome your input for future issues. Let's keep the conversation going.

Dalton McGuinty
Premier and Minister of Research
and Innovation

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AN INNOVATION TRANSFORMATION IS UNDERWAY

An interview with internationally-renowned Ontario futurist Jim Carroll





Jim Carroll

The looming impact of baby-boomer retirements and the worldwide shortage of replacement workers, for example will fuel fierce international competition for scientific and medical talent.

Twenty five years ago, Alvin Toffler focused the world's attention on the social and business impacts of technology driven change in books such as *The Third Wave*. Today, according to futurist Jim Carroll, that "wave" has swelled into a tsunami.

"What we're seeing is sweeping transformation at very fundamental levels," said Carroll. "The rate of change is not just accelerating: think hyper-innovation."

A lot of very savvy people think Carroll knows what he's talking about. *BusinessWeek* online recently listed the Mississauga-based consultant's blog as one of four sites to watch for insight into trends and ideas. He helps blue-chip clients — DaimlerChrysler, Nestle, Motorola, SAP, Blue Cross/Blue Shield, Glaxo Wellcome, Roche Diagnostics and many more — adapt to our rapidly changing business, social and economic realities. Carroll has studied trends for nearly 20 years, written or co-written 35 books and given keynote presentations at conferences from Zurich to Las Vegas.

Listening to him talk is like being caught in a torrent of ideas. Take healthcare, for example. "People are focusing on today's challenges," he said. "While that's important and those issues need to be resolved, people should be looking at tomorrow's opportunities and paying a lot more attention to more fundamental shifts in the healthcare landscape."

Hyper-innovation in life sciences

Medical knowledge is doubling every eight years, Carroll notes, and that rate is expected to drop to every two years in the near future.

He points out some of the staggering ripple effects generated by that pace of exponential growth.

- Hyper-growth in medical knowledge means that every medical professional is becoming more specialized and niche-oriented. Doctors will simply not be able to keep up with constantly evolving best practices.
- Highly intelligent, Internet-connected medical devices will provide new opportunities for monitoring and managing healthcare conditions.
- The rapidly shortening product life cycles that characterize consumer technologies will come to dominate the pharmaceutical and medical device sectors.
- A massive and profound shift in healthcare philosophy is coming with the emergence of extremely specialized and highly personalized medical treatments based on an individual's DNA.

These knowledge-driven changes, and many more like them, are all coming in addition to the ones we know about.

The looming impact of baby-boomer retirements and the worldwide shortage of replacement workers, for example, will fuel fierce international competition for scientific and medical talent.

For innovative organizations, tomorrow is the new today

High-velocity change is blowing through every sector, not just life sciences. Carroll is working with a wide range of

companies and organizations — including the Ontario Public Service — to help them survive and thrive in the new environment.

Among his top survival tips:

- Volatility is the new normal. Ensure that you make planning and flexibility cornerstones of your corporate capabilities.
- Meet the raised bar of expectations. As people and companies work with the best and brightest on the planet, the expectations get higher every day. Your clients and customers have options. They won't wait for you to fix your problems.

The future-friendly mind-set

Change is not easy for many to cope with and the pace we're witnessing in today's world makes many people anxious, even fearful. Carroll notices it when he speaks at conferences.

"There are two mind-sets that I see all the time," he said. "One sees every change as part of a downward trend. Everything is dark and just getting worse. The other sees change as opportunity."

Here in Ontario, Carroll has spotted that same split attitude about growth and economic development, and he has noticed a troubling increase in the number of nay-sayers.

"We can be wide open to the world and participate in global opportunities, or we can retreat and hide away from it," he said. "I sense folks are dispirited, especially in smaller communities. It's like they feel they tried it and it didn't work."

"We need to remind people of what is possible," he said. "We need to bring back the excitement, the passion for growth."

ONTARIO INNOVATION SNAPSHOTS



Ottawa-based XYZ RGB has figured out how to turn a paper-thin piece of plastic into moving poster advertisements. Using cutting-edge technologies, XYZ RGB can turn an eight-second video into a full-colour hologram that can be used to replace conventional 2D posters. Look for holographic advertising in malls, theatres and on billboards — any place that is exposed to light.

The film industry is the first target for what XYZ RGB bills as the next-generation movie poster. The company can place a short clip right in the poster,

Holographic advertising? Not as far-fetched as you may think

giving people a chance to view a scene without going into the theatre.

XYZ RGB is garnering attention worldwide. The Walt Disney Corporation, 3M, Pepsi-Cola, and even the organizers of the 2008 Olympic Summer Games in China are contemplating working the posters into their big events. This company has already seen success with its 3D laser scanning technology, used in Hollywood blockbusters like King Kong, The Matrix, Lord of the Rings and Batman, to name a few.

Keeping track with RFID

Radio frequency identification, or RFID is a technology that has existed for decades. But companies are only now beginning to develop its full potential — and analysts predict RFID could be a multi-billion-dollar industry by the end of the decade.

Two years ago, Waterloo software company iAnywhere leapt on to the RFID bandwagon with RFID Anywhere, a software platform for companies that use RFID systems. The key ingredients of RFID are tags, which can be as small as a fingertip, that transmit information to nearby receivers using radio waves.

RFID describes various technologies that use radio waves to automatically identify objects or people.



It is similar to bar code identification systems in retail stores. However, it does not need line-of-sight reading that bar code scanning requires.

Since launching the product, iAnywhere has found customers in many different industries. ProPath Laboratory, a pathology lab in Dallas, uses RFID Anywhere software to keep close tabs on its samples. The lab's computers can tell employees precisely who has been handling a given sample and what he or she has done with it.

RFID Anywhere can be used in transponders to track vehicles on highways or in hospitals to tell doctors and nurses where to find defibrillators.

Almost every day, there is news from across Ontario of new and exciting breakthroughs in medicine, technology and genetic engineering that will change the shape of our future. In this issue, we report on Ontario companies that have made breakthroughs in holographic advertising, micro-imaging and radio frequency identification (RFID).

A look within.

Imagine a micro-imaging tool that allows researchers to scan miniscule tissue changes and blood flow in mice — in exceptional detail and in real time. Now, imagine the implication for human health.

Mice share 95 per cent of their genes with humans, so they are an excellent model for pre-clinical research, says Ontario researcher Stuart Foster who has created the Vevo 770®. Produced by Foster's company, VisualSonics Inc. in Toronto, the Vevo 770 allows medical researchers to track what's going on inside a living mouse. Laboratories on four continents are using the micro-imaging system to test drug therapies and to study mammalian development, heart disease and cancer.

The Vevo 770 is non-invasive, so researchers can use it humanely in the same mouse over many weeks, instead of sacrificing mice at time-points throughout an experiment.

Researchers apply gel to an anaesthetized mouse, that lies on a "mouse couch". A scan head moves back and forth across the mouse's body and a monitor reveals the inner workings of the mouse.



VisualSonics' Vevo 770® Small Animal Micro-Ultrasound System

Over 250 organizations are now using the Vevo 770 including most major drug companies, Harvard University, Stanford University, Johns Hopkins University, the Max Planck Institute in Germany, Université de Montréal and the University of Calgary.

If you want your innovative product, service or process featured in this section of our newsletter, please e-mail

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WHY ONTARIO MUST INNOVATE — NOW!

An interview with Ontario Premier Dalton McGuinty

Q Why is innovation so important today?

Change is coming at us at a furious pace and the markets that embrace it are the markets that will win in the global economic race.

Today, more than ever, Ontario's economic and social prosperity depends on our ability to compete and win in the global marketplace. Innovation is the key to growing our existing companies faster and creating successful new ones. When that happens, people in Ontario enjoy the benefits through more rewarding jobs and more vibrant communities.

Devotion to research and innovation will lead to exciting new products and services, which will in turn, create wealth, raise our standard of living and enhance our shared quality of life.

Q What was the thinking behind creating MRI?

Innovation is critical to our future economic prosperity — that is why my government created the Ministry of Research and Innovation.

The Ministry of Research and Innovation was created to place a clear focus on the government's commitment to innovation as the driver of economic growth across all sectors of the economy. The ministry's mandate is to:

- develop an integrated innovation strategy and lead in its delivery,
- align and coordinate Ontario government investments in both policies and programs to deliver on the innovation strategy, and
- foster a culture of innovation and showcase Ontario, nationally and internationally, as an innovation culture.



Q What are the barriers to innovation in Ontario?

Lack of focus: The Ontario government has always invested in research, but funds have been spread across all ministries with little coordination. By working together across all ministries, we will achieve greater impact from our investments, which will keep our province competitive in the global marketplace.

Last year, my government created the Ministry and Research and Innovation and committed nearly \$1.7 billion dollars over five years to encourage, support and applaud Ontario's innovators.

Lack of communication: Government investments have resulted in a rich research base in Ontario, but not in an equally strong base of innovation-driven industry. I believe that bringing researchers, investors and entrepreneurs together will increase the likelihood of

getting ideas to market sooner. That is why we've created MaRS Discovery District and Ontario Centres for Excellence, where science and business are linked to get ideas out of the laboratory and into the marketplace.

The Ministry of Research and Innovation is also embarking on a marketing communications initiative to raise awareness among Ontarians of the need for continuous innovation and to highlight the great advances we've already made in our laboratories around the province. Internationally, we will market Ontario as the place to pilot new technologies.

Q What is your innovation vision for Ontario?

My hope is that my government will leave a legacy of an Ontario that will:

- be the preferred location to grow knowledge-based businesses
- be the preferred location for the best and brightest scientists and innovators from around the world
- attract increased private-sector investment in R&D
- generate the highly qualified workforce needed by an innovation based economy.

For that to happen, we need creativity and excitement about the possibilities for the future. Every one of us has creative potential. The Ministry of Research and Innovation's goal is to help unlock that potential inside every Ontarian, every institution, every company — and then share the benefits of that creativity with the rest of the world.



This is the first of a series on young Ontario innovators, what inspires them and their unique views on the future.

Young inventor has designs on entrepreneurial future.

Sixteen-year old, Mississauga student Steve Gasior has a passion for dreaming up and building innovative devices. He also has a pretty clear idea about how he sees his future unfolding. "After studying engineering, I really see myself setting up my own company," said Steve. "Given the kind of person I am, I think that would suit me best."

Steve has been fascinated by science and engineering since he was in grade seven when his Mom encouraged him to enter one of his projects in the Peel Region science fair. He was immediately hooked and has been tinkering — and entering fairs — ever since.

Last year, Steve was one of 1,500 students from 40 countries invited to enter their project in the 57th Annual Intel International Science and Engineering Fair, the largest of its kind in the world.



"After studying engineering, I really see myself setting up my own company. Given the kind of person I am, I think that would suit me best."

Steve Gasior

Up for grabs is more than \$3 million in awards, scholarships, tuition grants, internships, scientific field trips and five grand prizes: a \$50,000 college scholarship and a high-performance computer.

Steve's entry was a remarkable personal navigational device that emits a range of audible tones to serve as "second eyes" for the blind or people with low vision. It can also help firefighters in dense smoke or underwater divers searching for objects in muddy waters.

The device uses an array of ten head-mounted sensors that scans a 180-degree arc measuring distances of up to three meters. It signals the presence of objects to the wearer through tones of differing amplitude and frequency in either the left or right ear.

Demonstrating the kind of determination that will serve him well both as an innovator and an entrepreneur, Steve is now preparing his entry for the 2007 Intel Fair which will be held in Albuquerque, New Mexico.

But not all of Steve's time is spent dreaming up new devices. He's also a part-time lifeguard, an avid tennis player and a huge fan of power sports like dirt bikes, Sea-Doo's and ATVs.

For all the young inventors across Ontario who are working feverishly to complete their own science fair projects in time, Steve has a few words of advice.

"Don't give up," said Steve. "It's a lot of work, but it's worth it."



Steve Gasior's innovative navigational device that serves as "second eyes" for blind people or people with low vision.

Ontario charts a clear path to prosperity

Recently Premier Dalton McGuinty shared his government's strategic plan for innovation in the province. The plan will help to position Ontario as a centre of innovation in a fiercely competitive global economy. The following is an excerpt from Premier McGuinty's Statement to the Legislature on December 11, 2006.

(www.mri.gov.on.ca/english/strategy/ontario_plan_hs.asp)

"Today... I am presenting our strategic plan for consultation with stakeholders across the province. In crafting this plan, we consulted with researchers, industry, the private sector, academic institutions and other government ministries."

"The plan has clear goals:

- Ontario will be the preferred location to grow knowledge-based businesses.
- Ontario will attract the best and brightest scientists and innovators from around the world, with R&D excellence and efficient commercialization.
- Ontario will attract increased private-sector investment in R&D, becoming a leader in the rapid introduction and adoption of innovative products.

• Ontario will produce the highly qualified workforce an innovation economy demands.

• Our government will lead by example, with integrated and coordinated innovation initiatives across all ministries, and a culture of innovation in our own operations."

"We are conducting a series of public consultations, in every region of our province over the next few months."

"Innovation is key to growing a stronger, more competitive economy. When we succeed at that — when we create homegrown jobs from homegrown ideas — then the people of Ontario enjoy the benefits through good jobs, rewarding work and stronger communities."

It's your turn

Ontario Innovates exists to fuel continued and growing creativity among Ontario's researchers, entrepreneurs, investors, educators and future generations. In this inaugural issue – and in coming issues – our goal is to bring you:

- news on the latest inventions,
- views on the future from business experts,

- tips on unlocking creativity in your organizations, and
- ideas on the quickest way to bring your product to market.

Ontario Innovates is also a communications forum for keeping the innovation conversation going among scientists, business and government. Please let us know your thoughts on

our first issue. Your opinions will help us to deliver a quality publication that will encourage continued innovation in Ontario.

Please send your comments and suggestions to:
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The Ministry of Research and Innovation
www.ontario.ca/innovation