



## *Ontario's Gateway to Research and Discovery*

Submission to Ontario's Postsecondary Education Review

December 2004

# Introduction

***“Learning is about Opportunity. It is about imagination. It is about Innovation. It is about aspiring to excellence. It opens up the world to each one of us.”***

- Bob Rae

No other jurisdiction, anywhere, has a research and education telecommunications network that exceeds the reach and capability of ORION, the Ontario Research and Innovation Optical Network. Others are trying to catch up.

Today, ORION provides Ontario's postsecondary institutions with a competitive advantage in sparking innovation and propelling Ontario's knowledge economy forward in the 21<sup>st</sup> Century, capable of transmitting massive amounts of data from one end of the province to the other, and around the world – at the speed of light.

ORION brings our universities and colleges together in a new advanced technology infrastructure, leveraging our overall investment in research, education, and training – expanding capabilities beyond institutional walls. It enables collaboration and sharing across Ontario's entire postsecondary education system, and supports excellence and innovation in all of our postsecondary institutions.

Reaching beyond Ontario's borders, ORION links our researchers, educators and learners to knowledge resources, learning opportunities, centres of excellence and research facilities around the world. It opens up the global research and education community to every college and university faculty member and student in Ontario at their main campus, no matter where they are located in the province.

Ontario has a proud tradition of leadership in public education. It can build on its strengths and become a major global innovation hub for research and new discoveries, training for jobs of the future, and excellence in education and learning. To do so, Ontario needs to draw upon the collective resources available in all its postsecondary institutions and allied research and education facilities. ORION is bringing them together in a seamless web across Ontario, a powerful force driving the innovation economy.

## **Our objective in making this submission:**

To have the Postsecondary Review Advisory Panel include ORION in its report and recommendations, recognizing that ORION represents significant new system-wide infrastructure that will make an important contribution to delivering on the Panel's vision for Ontario's 21<sup>st</sup> Century postsecondary education system.

ORION is prepared to play its part. We cannot afford to lose out in the global innovation race. Our postsecondary institutions can leverage the system-wide potential of ORION for transformational innovations in research, education and learning.

“ORION will transform the way Ontario researchers and organizations collaborate with each other and their colleagues around the world. Our best researchers, teachers and students now have the high-speed and high-powered connections that will allow them to excel in the new digital knowledge economy.”

Dr. Ross Paul, President of the University of Windsor

# Meeting Postsecondary Sector Challenges

ORION is a new not-for-profit telecommunications network dedicated entirely to Ontario's research and education community. Today, it links the main campuses of all Ontario's universities, several teaching hospitals, 19 colleges of applied arts and technology, and other research and learning facilities to one another and to similar institutions around the world.

It is a system-wide tool for communication, collaboration and resource sharing. ORION is necessary inter-institutional infrastructure, as critical to institutions delivering on their research, education and learning mandates as their on-campus infrastructure.

ORION directly addresses three of the five major challenges outlined in the Postsecondary Review Discussion Paper.

## **Accessibility**

Equity of access is a core ORION value. Through one fully integrated network, ORION provides low-cost, high-speed telecommunications networking capacity to universities and colleges in all regions of the province at levels comparable to the most advanced research networks in the world, putting every institution on the same footing while enabling each to further develop its unique strengths. ORION allows Ontario's postsecondary institutions – for the first time – to collaborate and share resources and services cost-effectively, at new levels of communication across the province. ORION's leading-edge telecommunications capabilities provide an interactive communications superhighway, enabling access to the best knowledge and expertise that Ontario's postsecondary education system has to offer, to any institution, educator or learner on the network. It can, for example, link smart classrooms across Ontario's postsecondary education system in a new, collaborative environment allowing instructors and learners to interact with one another live and in real time. It gives access to learning a new meaning and provides a platform for teaching and learning in new ways.

## **Quality**

ORION helps Ontario make giant strides in the ability to deliver quality higher education by bringing 21<sup>st</sup> century technology and expertise to Ontario's postsecondary system. It enables new learning technologies and approaches to education and training to be developed, tested and implemented across the province. It brings high quality information and access to expert resources to all of our postsecondary education institutions. It connects Ontario to a vast and growing community of research and education leaders across Canada and around the world, enabling Ontario to be fully engaged at the leading edge of the transformation of the ways we all learn, teach, work and do business.

## **System Design**

ORION provides a strong foundation on which to implement the next generation of Ontario's postsecondary education system. It introduces a new range of options to the system that would be simply impossible or impractical to pursue, without ORION. ORION allows institutions to collaborate with each other and to share and make the best use of limited research and learning resources across the province. The network provides clear value in bringing learning resources and technology from across the province and around the world, to any Ontario postsecondary institution, lecture hall or lab. ORION has leveled the playing field and is freeing up dollars that can instead be spent on other priorities, in research and learning programs.

# Leveraging Resources

The investment in ORION has already been made. The network is built, in place throughout Ontario and fully operational, representing a significant public and private sector investment of nearly \$78 million.

ORION releases students, faculty, and researchers from significant geographical constraints. It encourages and supports teaching and research outside of traditional disciplines and silos.

Already, every, single university in Ontario has signed on to ORION, as have most Ontario colleges, teaching hospitals and public research facilities.

ORION connects these institutions to Canada's national research and education (R&E) network backbone, other provincial R&E networks and the global grid, giving Ontario a seamless integration of connected people and institutions. ORION transmits massive amounts of data at the speed of light. This capacity is transforming the way we conduct advanced research and education in Ontario, allowing institutions to collaborate in ways never before possible.

ORION links our postsecondary institutions in a vital new infrastructure enabling innovative inter-institutional and system-wide collaborations. It provides researchers, educators and learners across Ontario with access to a new level of research and educational resources.

ORION enables:

- high-speed access to digital libraries, online academic and research resources, and databases from around the world,
- grid computing and access to major scientific facilities on a regional, national or international basis,
- shared resources and enterprise-wide software across many institutions,
- innovative online and distributed distance learning, and
- virtual classrooms, enabled by broadcast quality, low-cost videoconferencing across multiple institutions.

## **Building on what's in place**

ORION's potential as an inter-institutional platform and as a dynamic engine for innovative approaches to research, teaching and learning can be leveraged to achieve the vision for Ontario's postsecondary institutions in the 21st century.

Inevitably, the future of Ontario's postsecondary institutions will unfold within a broader context that includes higher global connectivity and the public's desire for lifelong learning. In such an environment, it will be important for Ontario's postsecondary institutions to access and exploit through higher connectivity the wonderful potential of broader educational resources residing with TVOntario, the Bibliocentre, Contact North/Contact Nord, our science centres and cultural facilities and the world beyond Ontario.

# Keeping Ontario in the Lead

A new research and learning environment is rapidly evolving around the world and research and education networks like ORION are vital players in connecting the components.

No one public or private institution has all the leading researchers or educators in any single field. Information is no longer local, but global, and is increasingly web-based and multimedia in character. Learning is no longer time and geography dependent.

Learning and the world of discovery are increasingly complex, interdisciplinary and global in nature. Major research initiatives are multi-party, collaborative, reach across borders and multidisciplinary.

Mining the human genome data, modeling climate change, assessing environmental impacts, fabricating new materials, exploring the universe, developing new vaccines, visualizing alternative landscapes, reviewing economic models, developing new technologies, all involve new approaches to discovery and product development and the application of sophisticated information and communications technologies.

The new research and learning infrastructure includes ...

- Major data, information, and computational resources available at different facilities in different locations.
- Computational modeling, visualization and simulation capabilities at leading research sites.
- Software and collaboration tools and applications that enable scientists, educators and learners to use these resources as tools for discovery.
- Data gathering arrays including distributed sensors and instrumentation.
- Knowledgeable and connected researchers, educators, learners in different institutions and locations.
- Increasingly sophisticated institutional resources enhancing collaboration, supporting virtual campuses and e-learning.

ORION is uniting Ontario's institutions, their resources and researchers, educators and learners together in the new research and learning infrastructure. The outcomes for our research and education communities are just beginning to be realized.

"ORION represents an unprecedented opportunity for Northern Ontario's education and health organizations including colleges, universities and hospitals to collaborate with counterparts throughout Ontario, Canada and the world. "

- Maxim Jean-Louis, Contact North/Contact Nord

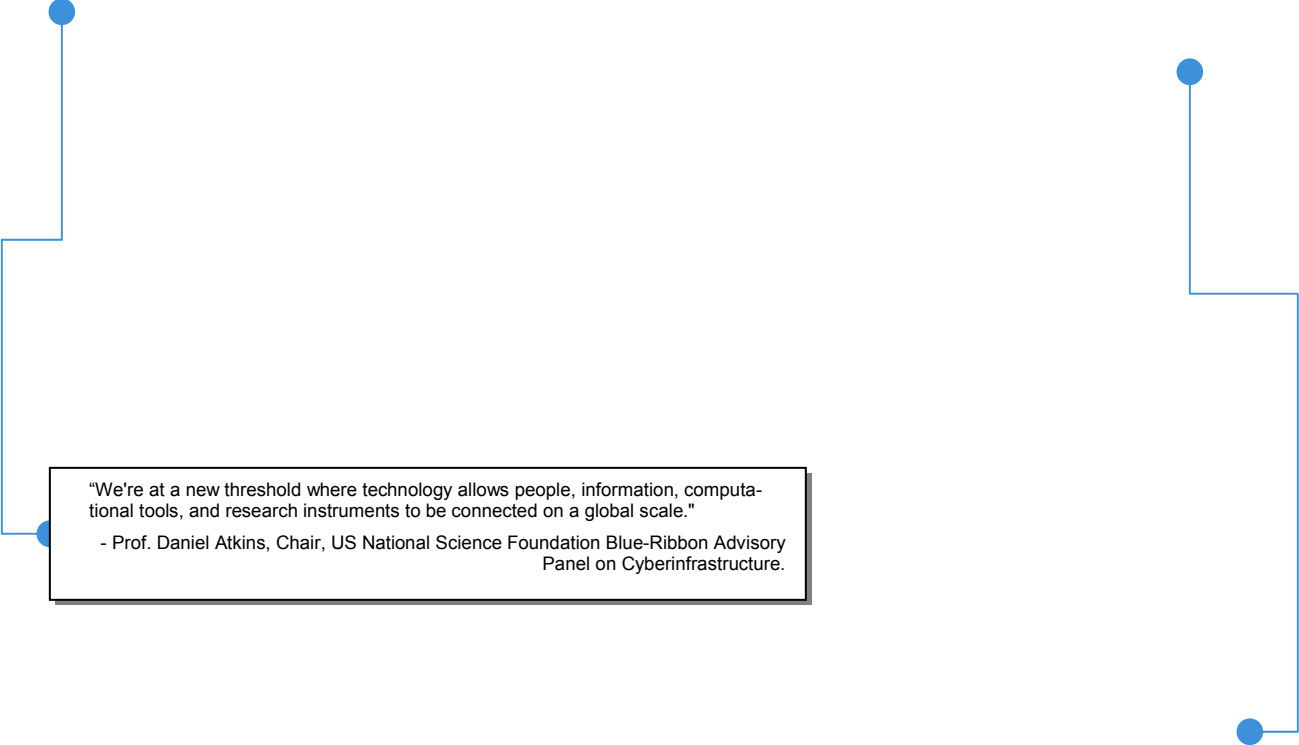
# Reaching Beyond Our Borders

The ultimate benefit of advanced networks such as ORION is how they can eliminate regional and national borders and enable a new era of innovation and collaboration between people and institutions in different regions and different countries. Excellence has no borders.

ORION has signed an historic agreement with the Michigan-based Merit research and education network, triggering the opportunity for new collaborations between leading researchers in Ontario and Michigan in fields such as particle physics, astrophysics, environmental technologies, landscape and urban design, telecommunications applications, genomics and other areas.

We are working with other regional networks around the Great Lakes Region, including those in New York, and Quebec, to create a regional research alliance, and to expand the innovation “ring” around the Region.

These new relationships will be of immense strategic value to Ontario and our relationships with our neighbours in Canada and across the border.



“We’re at a new threshold where technology allows people, information, computational tools, and research instruments to be connected on a global scale.”

- Prof. Daniel Atkins, Chair, US National Science Foundation Blue-Ribbon Advisory Panel on Cyberinfrastructure.

# Summary

Our objective is simple. Through this submission, we ask the Panel to recognize ORION as critical new infrastructure for Ontario's postsecondary education system, integral to building on our excellence and maintaining a leadership position in research and higher learning.

ORION is already in place, and ready to be put to use to its full potential.

ORION provides Ontario with a unique window of opportunity. While other jurisdictions are rushing to connect their postsecondary institutions and research facilities to the growing global grid of research and education resources, Ontario is achieving that goal.

**But we need to keep moving.**

Working together, we can maximize ORION's potential as an inter-institutional platform and as a dynamic engine for innovative approaches to research, teaching and learning across Ontario.

We look forward to working with our postsecondary education sector colleagues to ensure Ontario remains at the forefront of research, innovation and learning.

**Phil Baker**  
President and CEO

**Ontario Regional Advanced Network of Ontario  
Board of Directors**

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President, University of Windsor  
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President  
George Brown College

**Robert J. Kennedy, PhD.**  
Educational Consultant  
Apple Canada

**Stan Shapson**  
Vice President, Research and Innovation  
York University

# Who's Connecting

**The following institutions and organizations are now connected or have signed on to be connected to the Ontario Research and Innovation Optical Network (November, 2004)**

## Ontario Universities

Brock University  
 Carleton University  
 University of Guelph  
 Lakehead University  
 Laurentian University  
 McMaster University  
 Nipissing University  
 Ontario College of Art and Design  
 Queen's University  
 Royal Conservatory of Music  
 Ryerson University  
 Trent University  
 University of Ottawa  
 Wilfrid Laurier University  
 University of Ontario Institute of Technology  
 University of Toronto  
 University of Waterloo  
 University of Western Ontario  
 University of Windsor  
 York University

## Ontario Colleges

Algonquin College  
 Cambrian College  
 Centennial College  
 College Boreal  
 Confederation College  
 Conestoga College  
 Fanshawe  
 Durham College  
 Fleming College  
 George Brown College  
 Humber College  
 Lambton College  
 Loyalist College

Niagara College  
 Northern College  
 Sault College  
 Seneca College  
 Sheridan College  
 St. Lawrence College

## Teaching hospitals/medical research

Baycrest Centre for Geriatric Care, Toronto  
 Hospital for Sick Children, Toronto  
 London Health Sciences Centre, London  
 St. Joseph's Health Care, London  
 Sunnybrook and Women's College Hospital, Toronto  
 Royal Ottawa Health Care Group, Ottawa  
 University Health Network, Toronto

## Others

Contact North/Contact Nord, Sudbury/Thunder Bay  
 CRESTech, Toronto  
 National Capital Institute of Telecommunication, Ottawa  
 National Research Council - London  
 Roberts Research Institute, London  
 SHARCNET

## Ontario school boards

Algoma DSB, Sault Ste. Marie  
 Algonquin Lakeshore CSB, Napanee  
 CS du District du Grand Nord de l'Ontario, Sudbury  
 Keewatin-Patricia DSB, Dryden  
 Thames Valley DSB, London  
 Toronto DSB, Toronto  
 Northwest Catholic DSB, Fort Frances  
 Rainbow District School Board, Sudbury  
 Rainy River DSB, Fort Frances  
 York Region DSB, Aurora

## HOW TO REACH US



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ORION is owned and operated by the Optical Regional Advanced Network of Ontario (ORANO), a not-for-profit organization governed by a Board of Directors that includes leaders from the fields of education, research and business. The Government of Ontario is ORION's primary funding partner, with an investment of \$32.3 million. The federal government has invested \$3.4 million through CANARIE, Canada's Advanced Internet Development Organization, which operates CA\*net4. Additional private and public sector investments bring the value of the ORION project to over \$78 million. Our purpose is to link researchers, educators, scientists, learners and innovators in Ontario to one another, to colleagues around the world, and to networked resources so that they can advance research, learning, knowledge, technology development and scientific discovery.

[www.orion.on.ca](http://www.orion.on.ca)

THE ONTARIO RESEARCH AND INNOVATION OPTICAL NETWORK