

At one-year mark – ORION reshapes Ontario research & education landscape



One year after becoming operational, the Ontario Research and Innovation Optical Network has already started to reshape the research and education landscape in Ontario, bringing unprecedented levels of connectivity and opening the gate to new research, scientific discoveries and innovation throughout the province.

Reporting to ORION's Board of Directors this week, President/CEO Phil Baker highlighted how ORION is starting to make an impact on the province's research and education community, by triggering a new era of collaboration, data sharing and innovation.

Some 60 institutions and organizations are now connecting to ORION, the largest and most advanced R&E network of its kind in the world. It's fully operational in 21 cities across Ontario, with five dozen institutions already signed up, including every Ontario university, most colleges, several teaching hospitals, and a few school boards.

"A researcher or educator in Thunder Bay, Timmins or Sarnia has the same access to bandwidth and resources as a researcher in Toronto. That kind of access is a unique Ontario accomplishment."

" Ontario is now the standard and we're going to work hard to keep the lead ... "

"ORION has already put Ontario on the map when it comes to global connectivity for research. Ontario is now the standard and we're going to work hard to keep the lead," said Baker.

ORION's contribution and support to the

SHARCNET distributed computing project, for example, has helped to give Ontario a truly "landmark" project that is gaining notice from research colleagues across North America.

ORION has also helped the Northern Ontario School of Medicine by providing a cost effective network infrastructure that allows the school to invest more funds in research and teaching.

ORION is a driving force behind an alliance of research networks around the Great Lakes, including Quebec, Michigan and New York, moving towards a vast "grid" for research and discovery across the Great Lakes region and beyond.

These links with peer networks around the Great Lakes have "immense strategic value to Ontario," said Baker.

(Continued on page 5)

Robarts opens state-of-the-art imaging labs



London's Robarts Research Institute officially opened its new Clinical Imaging Research Laboratories earlier this month, the result of an ambitious partnership to advance research findings through clinical studies.

The new labs, unique in Canada, will be a hub for multidisciplinary imaging research in respiratory, cardiovascular and orthopedic medicine where research volunteers can take part in studies using state-of-the-art imaging technologies, including high- and low-field MRI scanners, 3D-ultrasound and computed radiography.

Ontario Minister of Economic Development and Trade Joseph Cordiano joined the official opening on September 22 - including tours of the labs and demonstrations of equipment – along with senior executives from private sector partners, Merck Frosst Canada and GE Healthcare.

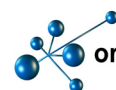
The Institute is among the several institutions in the London region to connect to the ORION network.

(Continued on page 2)

Also in this issue ...

- HPC "critically important" to Canada's future
- Northern medical school pioneers "Distributed Learning"
- New nano lab makes giant leap in "small" science
- ORION News Briefs
 - Trent hosts ORION Day
 - Michigan upgrades R&ED network
 - Halifax hosting CANARIE workshop
 - RISQ annual conference
 - Korea & Barcelona send HD over CA*net 4
 - New Lakehead Research VP aims for the top
 - € 93 million for massive GEANT upgrade
 - Georgian offers UofWindsor Engineering Degree

The ORION Research and Discovery News is a monthly electronic publication providing news and information of interest to users of the Ontario Research and Innovation Optical Network and to the worldwide research and education community.



Need for more qualified people

HPC "critically important" to Canada's future



A new survey of industry experts is calling on Canada to boost its efforts to develop and support the high performance computing (HPC) industry, as "critically important" to the health of our country.

"The importance of high performance computing in sustaining Canadian competitiveness across all sectors cannot be understated," says the President of the Canadian Advanced Technology Alliance (CATA, John Reid.

The report, titled "A Survey of the State of Canadian HPC Readiness and the Need for Highly Qualified People" also determined that the industry itself has a difficult time defining precisely what constitutes high performance computing.

This preliminary survey was undertaken by CATA at the urging of the C3.ca Association (www.c3.ca) in attempting to quantify the HPC

community's needs for its soon-to-be-released Long Range Plan.

"The Long Range Plan needs to have a strong educational component that C3 can and should set about achieving right away," says C3.ca Chair, Jacques Lyrette, who indicates C3 will develop information materials to increase the awareness and understanding of the importance HPC can have on organizations' bottom lines.

"The field of high performance computing is quite diverse and, as discovered through the differing views offered by respondents, not consistently defined or agreed upon," says Kevin Wennekes, CATA's Director, Policy Research and Advocacy.

"Many large firms, for example, were unable to locate a single, internal source who could speak to the entire range of HPC activities they conduct."

"There has been a very positive and proactive response towards taking this initial study further," says Wennekes. "Firms such as Bombardier, IBM, and Pratt and Whitney have all expressed a clear desire to sit down with CATA and define a means of furthering the work we have started with this preliminary discovery initiative."

Several companies said they need highly qualified people who possess the skills and knowledge needed to perform HPC functions. The survey showed the skill requirement cut across all sectors.

The momentum generated by this initial dialogue will continue to gather force, predicts Reid, who is calling on organizations interested in participating to contact CATA to signal their desire to be included in the process.

For more information, visit www.cata.ca or www.c3.ca.



Robarts opens state-of-the-art imaging labs

Continued from page 1)

"The Human Genome Project and the huge advances in information technology capacity have resulted in enormous new opportunities for discoveries to improve human health. The partnerships between Robarts and Merck and Robarts and GE

Healthcare are meant to bring our discoveries more effectively to the clinic and to the patient," said Dr. Mark Poznansky, Robarts President and Scientific Director.

The labs were created to facilitate the critical interactions between clinician scientists, engineers, physicists, and biologists -- key to advancing our understanding of noninvasive biomarkers of disease and health as well as to test new diagnostics and treatments for a host of illnesses including heart disease, cancer, bone disorders, asthma and lung disease.

Located in 10,000 sq. ft. of Robarts' new building expansion, the new labs are the result of a combined investment of more than \$15 million from partners Merck Frosst Canada, Merck Research Laboratories and GE Healthcare, London philanthropists Mr. and Mrs. Beryl and Richard Ivey and orthopedic surgeons Dr. Cecil Rorabeck and Dr. Robert Bourne.

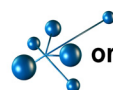
Housed within the new facility are, the Merck Frosst Centre for Respiratory Imaging Research, the Beryl and Richard Ivey Centre for Cardiovascular Imaging, and the Orthopedics and Musculoskeletal Imaging Program.

The Merck Frosst investment, amounting to nearly \$5 million, supports a new respiratory imaging research program that has laid the foundation for the recruitment of Robarts Scientist Dr. Giles Santyr, Director of the Merck Frosst Centre for Respiratory Imaging, who is also Professor of Medical Biophysics and Diagnostic Radiology and Nuclear Medicine at The University of Western Ontario.

Dr. Santyr is developing the use of hyperpolarized gas for low-field MRI to allow better exploration of the airways of the lungs in disorders such as asthma and allergies.

The Institute expects the new facility will build on Robarts' track record in medical imaging. Robarts is already home to Canada's first high-field MRI research lab (since 1996), one of only three now in Canada and only about 15 worldwide. The Institute has also pioneered important advances in 3D-CT, micro-CT and ultrasound technology related to heart disease, stroke and cancer.

Learn more at www.robarts.ca.



Northern medical school pioneers “Distributed Learning”



While dignitaries gathered to break ground for the new Northern Ontario School of Medicine in Thunder Bay a few weeks ago, the real “ground-breaking” has been taking in the Distributed Learning approach the new school is helping to pioneer.

Premier Dalton McGuinty, partners and school officials came together at Lakehead University’s main campus on Aug. 26, to mark the start of construction of an \$8 million, 30,000 square-foot facility.

The focus that day was on the new bricks and mortar. The true innovation, though, is the new approach to teaching and learning based on network connectivity that allows the school to connect with northern communities, in some cases, over vast distances.

“Now that we have the support facilities and infrastructure to use our technology, our primary task is to connect technology and users at an early stage so that we can be aware of initiatives requiring technology and prevent duplication of effort and redundancy of systems,” says Dr. Roger Strasser, Founding Dean of the Northern Ontario School of Medicine.

He cautions not to mistake Distributed Learning for Distance Education. “While there might be a similarity in terms of removing geographical barriers, Distributed Learning means that students can access information and materials through technology, at a convenient time and frequency.”

“The Distributed Learning method supports their work and study through an open technology concept, for instance, while students undertake clinical placement in rural, remote, northern communities, they can connect to campus resources,” he says. “The faculty will use the technology to post information and learning materials, thus overcoming the sense of isolation they might feel.”

Dr. Strasser believes the school’s use of the method will become a benchmark for best practices. He credits the partnership with Laurentian and Lakehead universities and collaboration with the Northwestern Ontario Medical Program (NOMP), the Northeastern Ontario Medical Education Corporate (NOMEC), Contact North, NORTH Network and K-Net, in establishing a sophisticated network and technology to support the school’s Distributed Learning plan.

Among the partners, the universities are leveraging their expertise and networking capabilities, while Contact North assists with audio-conferencing. NORTH Network assists with videoconferencing needs. K-Net’s role is to help the medical school network in the far north.

In terms of curriculum, the school intends to provide a comprehensive and flexible curriculum where case-based learning is made possible. It will make use Lakehead’s WebCT license as part of its Virtual Learning Environment (VLE) to support its curriculum development. Teaching

technology is built in on a “smart classroom” concept, modeled after the programs in Lakehead’s Advanced Technology and Academic Centre.

Distributed Learning is also a main theme of the sixth annual Associated Medical Services/Council of Ontario Faculties of Medicine Conference, being hosted by the Northern School of Medicine in Thunder Bay November 18 and 19.

It is bringing several Canadian and international experts to the north, including a Distributed Learning Panel featuring Raymond Christensen, MD - Associate Professor of Family Medicine, RPAR Program in Duluth, MN; Tim Zmijowskyj, MD - Division Head, Northern Ontario School of Medicine; and Doug Schaad, PhD - Professor, Department of Medical Education, University of Washington, Seattle.

Apart from the school’s ability to become a virtual test-bed for Distributed Learning, the school also showcases the vast potential of the ORION network itself, which physically connects the school’s main campuses in Thunder Bay and Sudbury.

Cautions not to mistake Distributed Learning for distance education ...

Faculty and students are already making use of the ORION connectivity for advanced video conferencing, data transfers and other services.

Learn more on the new medical school and the annual conference at www.normed.ca



Home About Us* Prospective Students* Media Room Events & Publications* Employment Research Library

Welcome Bienvenue

Northern Ontario School of Medicine

Dean's Column - Getting to Know Our Technology and Distributed Learning
En Français

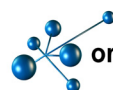
by Dr. Roger Strasser
Founding Dean
Northern Ontario Medical School

Many of you may be curious to know how the Medical School is going to use technology to the best advantage for our students. Allow me to share the good news with you.

While some people may think that technology depersonalizes the way we interact as a society, we firmly believe that technology will permit students to travel to distant communities and interact directly with people, clinicians and patients. Our use of technology will enhance human contact for our students while, at the same time, connecting them with the learning tools, information and support they need to pursue their medical studies and their involvement in the communities. It will contribute to the unique learning and teaching environment of the Northern Ontario Medical School

Distributed Learning should not be mistaken for Distance Education. While there might be a similarity in terms of removing geographical barriers, Distributed Learning means that students can

Read Dr. Strasser's full discussion on Distributed Learning at the Northern Medical School web site





Trent hosts ORION Day

Trent University is hosting an ORION – CA*net4 Day in Peterborough Oct. 26, bringing researchers and educators together to profile their work and to learn more about collaborating over the ORION and the CA*net 4 advanced research and education networks. The workshop will also bring participants from Fleming College and other regional institutions. For information, visit www.orion.on.ca/orioncanet4days.html

Michigan upgrades R&E network

Michigan State, the University of Michigan and Wayne State University recently formed MiLR, a consortium to establish their own high-performance research network. "Creating MiLR will give MSU, U-M and WSU a competitive advantage in attracting external support for research and will attract students and faculty to our campuses," said John S. Camp, CIO at Wayne State. "We are now members of a small and elite group of universities nationally that are investing in high-performance networks to strengthen research and facilitate collaboration." The network will connect the universities to each other and to national and international networking hubs in Chicago, including the National LambdaRail, Starlight, and a growing set of network connections that are building the U.S. cyber infrastructure supporting science and new discovery. Merit, Michigan's R&E network operator, will also use MiLR for collaboration in advanced research and education between the United States and Canada. Merit and Ontario's ORION network are interconnecting between Detroit and Windsor.

Halifax hosting CANARIE workshop

Nova Scotia is set to welcome Canada's R&E networking community at CANARIE's 10th Annual Advanced Networks Workshop, in Halifax November 22 to 24, 2004. This year's workshop will focus on developing common network tool sets and services for shared access to research infrastructure facilities across Canada using the high speed networks of CA*net 4 in partnership with the Optical Regional Advanced Networks in each province. A major theme is the new class of shared infrastructure, called "intelligent infrastructure", which is transforming computational and network research and leading to new distributed architectures for data collection, storage, distribution and analysis. The conference will feature leading international speakers who are involved with the cyber-infrastructure and e-infrastructure programs. Other invited speakers will include representatives from some of Canada's major research infrastructure projects. As well there will be a number of national and international speakers who will be talking about the next generation

research optical networks that will be required to support e large i-Infrastructure initiatives. The annual IWAY Awards will also be presented. Learn more at www.canarie.ca.

Korea & Barcelona send HD over CA*net 4

Researchers at KISTI (with ANF HDTV TF) in Korea and i2CAT in Barcelona Spain have recently carried experiments by transmitting HDTV video over Canada's CA*net 4 network, demonstrating that Digital Cinema HDTV quality transmission can work smoothly over vast distances. The research used CANARIE's User Controlled LightPaths (UCLP), which permits end user control of the traffic engineering of the IP network route and allowed direct peering between Korea's KREONet2 network and Barcelona's i2CAT network over CA*net4. The transmissions were compressed HDSI at 270Mbps, with the collaboration of Research Channel. For the first time, HDTV over IP transmission spanned three continents - Europe, North America and Asia. The Korean team at GIST in Gwangju, Korea got several cultural productions about Gaudi architecture taped in HDTV format by i2CAT. The User Controlled LightPaths used software developed by the Communications Research Centre in Ottawa and the University of Ottawa, which has been deployed across CA*net4. www.canarie.ca/canet4/uclp/uclp_software.html

RISQ annual conference

The 15th annual conference of the Réseau d'informations scientifiques du Québec (RISQ) will be held in Montreal, October 26 to 28. ORION President/CEO Phil Baker will be among the presenters in an Oct. 28 session on the broader global research and education network community. This year, the conference agenda will focus on member services and practical uses of the RISQ network. Learn more at www.risq.ca

New Lakehead Research VP aims for top

Dr. Rui Wang, who starts in his new function as VP of Research at Lakehead University, aims to place the Thunder Bay institution among Canada's top 25 research universities within the next five to ten years. Dr. Wang, who aims to achieve that vision by "strengthening our research strongholds and motivating the whole academic community", says Lakehead will also strive to become internationally competitive. Dr. Wang comes to Lakehead from the University of Saskatchewan where he was Professor and the Leader of the Cardiovascular Research Group and of the Cardiovascular and Respiratory Network. Prior to this, Dr. Wang was an Associate Professor at the University of Saskatchewan (1997 to 2001) and an Assistant Professor at the Université de Montréal (1993 to 1997). Dr. Wang's research on cardiovascular physiology and pathophysiology has been funded by CIHR, NSERC, and other agencies and industry. He is the author of two books, holds two patents, and lists 95 published papers.

SCHARCNET workshop to focus on SMP

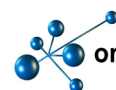
This year's SHARCNET Fall Workshop is scheduled for October 13 to 15, at Waterloo's Wilfrid Laurier University. The sessions will focus on Shared Memory Programming (SMP) systems, and their associated techniques. A bonus day has been included on Oct. 12 for those interested in a general Introduction to High Performance Programming. The workshop will feature talks on leading-edge computing hardware, tutorials on software such as libraries, and seminars and keynotes on fundamental computing strategies. Learn more at www.sharcnet.ca/events/fw2004/

€93 million for massive GEANT upgrade

The European Commission in Brussels has signed a contract for €93million (\$145 million CDN), covering under 50 per cent of total anticipated costs of a massive upgrade to Europe's GEANT communications network for research and education. Upgrades will include high-performance services and a mobility-roaming service that will enable scientists to stay connected to GÉANT wherever they are doing their research. New End-to-end connectivity will enable scientists to have their "own" virtual private networks. GÉANT and its partners, the National Research and Education Networks (NRENs), together provide the research communications backbone infrastructure for 34 countries in Europe. The European Commission's contribution to this project, €93 million, is estimated at less than 50% of total expenditures. The remainder will be co-financed by the participating countries. The upgraded network, co-coordinated by DANTE, will use a hybrid architecture that combines the best technology from the worlds of telephony (switching) and the Internet (routing). This will provide faster, more powerful services for the most demanding users, creating dedicated routes along predictable traffic paths. Learn more at www.geant.net.

Georgian offers UWindsor Engineering Degree

Beginning in September 2005, Barrie's Georgian College will offer an accredited four-year Bachelor of Applied Science - Mechanical Engineering (Automotive Option) from the University of Windsor. This is a first in Ontario. No other Ontario college has partnered with a university to deliver an accredited engineering degree. This is the first degree-completion program at the Barrie campus in the technology field. Georgian College President Brian Tambllyn gave credited the vision and commitment of teams from both the college and the university. The B.A.Sc. degree prepares students to become professional engineers upon completion of the required work experience. "The ability to offer this specific engineering degree at the Barrie Campus supports recognition of our two institutions as being leaders in the automotive education field in Canada," Tambllyn said. www.georgianc.on.ca



New nano lab makes giant leap in “small” science



The University of Western Ontario, making a large leap ahead in terms of “small” science, has officially opened its \$23-million nanofabrication laboratory, expected to advance research in areas that can be measured on the nanoscale – as small as a billionth of a metre.

The ceremony was held in London on Sept. 23, in conjunction with the visit of new President and CEO of the Canada Foundation for Innovation (CFI), Dr. Eliot Phillipson.

“We want to go where none of us – not the researchers, not the Faculty of Science, not the University – have gone before,” says Ian Mitchell, principal investigator at the laboratory.

The new facility will focus on photonics, where sophisticated new lithographic tools, including a focused ion beam, allow for pattern and feature definition of materials at dimensions below the wavelength of light. Several sectors will benefit from this work, including the telecommunications and information technology sectors, where nanofabrication may result in smaller photonic components, lower power usage and greater bandwidth. In engineering, nanofabrication may lead to the construction of ever-smaller electronic circuitry.

This technology may also alter the pharmaceutical industry by providing new ways to administer drugs.

CFI provided more than \$3 million toward the construction of the laboratory, in conjunction with substantial grants from the Province of Ontario and gifts of equipment from Nortel Networks.

“Continued support from the CFI – including an investment in this leading facility – demonstrates the level of research excellence at Western and helps to solidify our position on the world stage,” says University President Paul Davenport.

“I congratulate Professor Ian Mitchell and his team of researchers, whose work has been instrumental to the inspiration for, and creation of, this laboratory.”

“Today’s opening of the nanofabrication laboratory is a powerful example of what can be achieved when various stakeholders come together as partners,” says Phillipson. “The research investment we are celebrating today will further enhance Canada’s capacity to effectively compete in the global technology arena.”

To maximize use of this facility, researchers at Western, McMaster and the University of Waterloo have joined forces to form the Ontario Photonics Consortium, and will bring their diverse strengths to this cutting-edge research while strengthening collaborative ties between the universities. Learn more at www.uwo.ca.



At one-year mark – ORION reshapes Ontario research & education landscape

(Continued from Page 1)

While the focus of Phil Baker’s and the ORION team’s job over the last 18 months was the building and completion of the network, the focus now is on growing Ontario’s R&E family of connected users and exploiting the full capacity of ORION.

One strategic goal is to gain recognition for ORION as critical infrastructure, among policy and funding agencies, just as important as our highways and railways, and as essential as the bricks and mortar of our colleges and universities and research labs.

“Today’s new global research environment is all about connectivity and collaboration. No one public or private institution has all the leading researchers in any single field. Major scientific instruments, sensors and experimental facilities are spread throughout the world.

“Leading large-scale computation resources and data repositories are distributed in a few locations. Major global research initiatives are multi-party, collaborative, reach across borders and increasingly multidisciplinary

“What ORION brings to Ontario is the capacity for virtual research and

learning communities, or clusters, bridging public and private sector partners, and enabling traditionally separate disciplines to come together,” says Baker.

ORION is also working with Ontario’s school boards to help them identify the benefits of connecting to ORION and the growing global mesh of resources for teachers and learners available over R&E broadband networks.

The organization plans a series of briefings, events and workshops over the fall and winter, and an aggressive push to the broader R&E community.

“We’re just starting to scratch the surface of what this network can do for Ontario,” said Baker, who is devoting much of the next several months to meeting and briefing science, education and government leaders on the benefits of leveraging ORION to advance Ontario’s research, innovation, education and economic agenda.

“The goal is carving ourselves a piece of the global innovation pie. ORION gives us a roadmap to take us there,” he said.



ORION RESEARCH AND DISCOVERY NEWS

ORION is an advanced high-speed fibre optic network that connects research and education institutions to each other and to colleagues around the world. Spanning 4,200 kilometres to 21 cities throughout the Province of Ontario, ORION brings leading-edge network capability to the publicly funded R&E community and is a catalyst for creative and innovative next generation Internet applications. ORION is owned and operated by the Optical Regional Advanced Network of Ontario (ORANO). Visit our web site www.orion.on.ca or write the Editor at info@orano.on.ca. Subscribe to this newsletter, visit www.orano.on.ca/newsletter/subscribe.html

