



... making a difference ...

in training ...

When St. Lawrence College in Kingston entered into an agreement with Sudbury's Laurentian University to deliver a collaborative nursing degree program, access to ORION effectively made the 600 kilometres that separate the two institutions vanish. Starting in September 2005, St. Lawrence faculty members began teaching the first year of Laurentian's four-year nursing degree program, partly delivered through high-speed videoconferencing. Enrolment is set to grow to several hundred over the next few years. The technology also assists in the mentoring of St. Lawrence faculty on the Laurentian curriculum and facilitating collaboration in creating an extended "community of learning."

"Having access to ORION has certainly helped make our joint program much more engaging and cost-effective. Being able to collaborate with new partners over a very high-capacity network opens the door to all kinds of new possibilities for St. Lawrence." - Chris Whitaker, VP Academic, Executive Director, Kingston Campus, St. Lawrence College

in research ...

In a high-performance computing twist on the old adage "many hands make light work," the Shared Hierarchical Academic Research Computing Network (SHARCNET) harnesses the combined power of computers across south central Ontario via ORION to create one of the world's most powerful supercomputers. ORION provides the high-bandwidth, point-to-point connections that allow the seamless integration of SHARCNET's distributed processors to efficiently leverage computer resources that are separated by hundreds of kilometres. Researchers at the 11 universities and colleges in the SHARCNET consortium are using this massive power to model the movement of urban pollution, create more efficient electronics, understand the outbreaks of diseases such as SARS and delve deeply into questions of basic science.

"The SHARCNET community is growing rapidly as more researchers in more disciplines discover how the network can help them. ORION is essential infrastructure for us and we will come to rely on ORION more and more as we build an integrated set of network services - data storage, scheduling, remote collaboration capabilities - across the consortium." - Prof. Hugh Couchman, McMaster University, SHARCNET Scientific Director

in the arts ...

The University of Waterloo is making use of its ORION connection to pioneer a new form of theatre. This research project involves staging live, interactive theatrical performances linking actors and sets from remote locations, using advanced networks and videoconferencing technologies. A fully interactive live performance was staged with actors in Waterloo sharing a virtual stage with actors at Bradley University in Illinois and University of Central Florida, connecting at very high speeds over ORION, CANARIE and Internet2. The latest production to take place was of Lewis Carroll's "Alice in Wonderland." Researchers are now working on staging more complex productions and pushing the limits of the current software, and designing devices to allow remote audiences to respond with instantaneous feedback.

"Eliminating bandwidth as a barrier will certainly drive innovations in the way we can communicate with each other. We're using technology to create a new form of theatre, and having access to ORION makes that possible." - Prof. Dr. Gerd Hauck, Chair, Drama and Speech Communication, University of Waterloo

in science ...

From almost two kilometres below the ground in Sudbury, researchers at the Sudbury Neutrino Observatory (SNO) measure and investigate the fundamental elements of nature - neutrinos from the sun. This is "big science," questions of how the world began and how it works at the most basic level, questions that have engaged scientists around the world for hundreds of years. Neutrinos are one of the smallest particles in our Universe, but studying them calls for massive data sets that range up to ten terabytes in size. Moving that data from SNO to research partners at universities across Ontario and internationally, from the U.S. to the U.K., calls for a high-bandwidth network that is robust, reliable and globally connected.

"Finding answers to the big questions in science today is an international team effort. Canada is recognized as a valued partner that can make a significant contribution to the search for answers. Quite simply, ORION makes our participation possible." - Alain Bellerive, SNO, Canada Research Chair, Carleton University



... making a difference ...

in building capabilities ...

As Ontario's colleges of applied arts and technology develop and expand their degree programs and applied research activities, the availability of a shared, high-capacity network infrastructure becomes increasingly critical. One example is the collaboration between Algonquin College in Ottawa and Niagara College in Welland, joining forces over ORION to offer joint photonics instruction to future optical engineers who will be employed in Canada's world-leading technology sector. The colleges not only utilize advanced realtime videoconference linkages, they are also exploring ORION's full capabilities to introduce software tools that will provide Niagara students with remote access to Algonquin's state-of-the-art photonics lab equipment and lasers over 500 kilometres away.

"ORION has completely transformed the way we can design and deliver instruction to students. It does not matter that we're separated by geography. With ORION, we're all connected together now." - Prof. Wahab Almuhtadi, Electronics/ Electro-Mechanic Studies, Algonquin College

in education ...

The classroom walls disappeared recently for Grade 12 political science students at Middlefield Collegiate Institute in York Region. In a real-time, videoconference mock trial before a Supreme Court judge in Ottawa, the students vigorously prosecuted a drinking and driving case. The defense team was at another York Region school, while a class in Alberta served as the jury. All four sites were brought together by York University's Advanced Broadband Enabled Learning (ABEL) program over the ORION network. It was a high-impact, real-world learning experience for the students. The mock trial was just one of the many learning and education events which led ABEL to win the prestigious Learning Partnership 2005 National Technology Innovation Award.

"Broadband networks and collaborative technologies allow the teacher to provide real-world connections to learning. ORION gives faculty, teachers and students amazing new opportunities for teaching and learning experiences that are limited only by our imagination." - Janet Murphy, Program Manager, ABEL

in remote diagnostics ...

The Laboratory for Collaborative Diagnostics at the University of Toronto is making innovative and creative use of their lab's connectivity to the ORION network by developing a Collaborative Digital Microscope (CDM) for remote diagnosis. The CDM allows physicians or researchers to review a sample of blood that may contain malaria parasites under a microscope and interact in real time with a malaria expert in Toronto, who can help determine if malaria is present. Open-source collaboration software is used, enabling very high-resolution images to be transmitted over a live digital video feed of the malaria parasite, which is accompanied by a audio feed that permits a collaborative diagnosis.

"Having access to ORION helps make this possible. The network's multicast capabilities allow us to take this idea even further, on a global scale. This is a powerful new tool that can make a genuine difference in the way we diagnose and confirm the presence of infectious disease, when speed and time is of the essence." - Dr. West Suhanic, Laboratory for Collaborative Diagnostics, University of Toronto

in medical training ...

A new Medical Education Building was built on the University of Windsor campus to house the Windsor-based branch of the University of Western Ontario's Schulich School of Medicine & Dentistry program. Able to accommodate up to 200 medical students, the facility boasts two 50-seat lecture rooms equipped with high-definition videoconferencing (VC) technology, and a virtual anatomy lab where the students will study and manipulate 3-D anatomical images using a computer. LARG*net and ORION together built a dedicated VC network between the UWO, the University of Windsor, and London and Windsor teaching hospitals using a Layer 2 connection that runs on ORION between London and Windsor. The speed and reliability of ORION has enabled fully-functional high-definition VC with individual microphone setups in each of the London and Windsor teaching rooms.

"The reliability of ORION has ensured the school's ability to teach interactively for three to four hours a day without interruption - something that would have been much less likely with "traditional" VC using internet. Our use of ORION has made the vision of highly-interactive distributed medical education in Southern Ontario a reality." - Dr. Peter Flanagan, Director, Faculty E-Learning, Schulich School of Medicine & Dentistry.



... making a difference ...

in collaborative learning ...

Hooking up to ORION has enabled Sault Ste. Marie's Algoma University to become the exclusive North American host site of an internationally renowned Master's program in computer gaming. The collaborative program sees Algoma U students participate remotely in classes taking place in Scotland over an advanced videoconferencing system supported by connections over ORION, CANARIE and JANET (the U.K. national R&E backbone). The University of Abertay Dundee's (UAD) computer arts division is internationally renowned and was the first in the world to offer a Master of Science degree in Computer Games Technology (CGT). Teaming up with UAD, Algoma U is the first North American university to offer this unique program.

"We have been impressed by the high quality of the videoconference connections to Scotland over ORION. It's as though we're interacting with people who are in the classroom next door." - Danny Reid, Divisional Director, Information Technology Services, Algoma U

The University of Ontario Institute of Technology (UOIT) and Trent University have become the first in Canada to use AccessGrid (AG) for the delivery of a complete academic program. The two universities are pioneering this new form of multi-institutional graduate program delivery with their Master of Science program in Materials Science. A key component of the program was the delivery of all courses via AccessGrid. Both are members of the SHARCNET consortium to facilitate the program delivery and to take advantage of SHARCNET's unique high-performance computing resources. Specially designed AG rooms were completed at each site in time for the program's launch in September 2007. The AccessGrid technology over SHARCNET goes beyond the limits of standard videoconferencing. It provides high quality transmission of not only voice and video, but also reliable delivery of any computational content produced on a tablet PC at any of the participating sites. By being carried exclusively by SHARCNET and ORION, participants can rely on the throughput and security of the AG facilities. Also, unlike standard videoconferencing, AG uses multiple cameras and large projection or plasma displays, so the experience for participants is immersive.

in digital cinema ...

Ryerson University in Toronto is a founding member of CineGrid™, a consortium of worldwide labs including the University of California San Diego, University of Southern California, and Keio University in Japan. Ryerson's Rogers Communications Centre, which houses the university's media schools, is opening a new digital lab complete with state-of-the-art equipment and a 10 Gbps direct "lightpath" connection over CANARIE that will enable collaboration with other CineGrid™ participants. This will enable collaboration on projects with other students, hands-on training with next-generation equipment and practical experience with what is reputed to become the new standard medium of the industry. With the new digital lab, Ryerson is poised to become the hub and leader of digital cinema in Canada. The digital image maintains the film format's maximum fidelity, yet real-time collaboration at the production and post-production levels requires much greater bandwidth. The ultra high bandwidth of CANARIE, ORION and other R&E networks permits filmmakers and technicians to see, hear and manipulate the same material in real time with no time lag, no matter where they are physically located.

in data storage ...

ORION supports the work of researchers at the University Health Network (UHN) in Toronto, enabling dramatic improvements in connectivity and access to new tools and resources, and opening the doors to enhanced participation in medical research collaborations and trials. Connecting to ORION over GTAnet, UHN is a data-centric organization where researchers accumulate half a terabyte of new information each week. This amount is steadily increasing, driving up competition for bandwidth. Thus, it is easy to see why ORION is actively promoted internally to address researchers' need for large database storage.

"The previous technology that handled the day-to-day business of UHN did not work at all well until ORION came on stream, connecting the 10,000-plus staff, medical researchers and trainees competing for bandwidth." - Thomas Goldthorpe, Director of Research Information, UHN