

NETWORKING

**The uber Internet quietly carves a niche
Ontario's ORION a conduit for research
By GRANT BUCKLER**

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The Internet has become a staple tool of society, linking homes, schools and businesses in a huge web of commerce, research and entertainment. But what many don't realize is that there are other more advanced networks contributing a lot to society behind the scenes, too.

The Ontario Research and Innovation Optical Network (ORION) is a 4,000-kilometre fibre-optic system that received \$32.3-million from the province and began operating in the summer of 2003. It extends from Windsor to Ottawa and north to Thunder Bay, with points of presence in 21 communities.

With the recent addition of Georgian College, the province's high-speed research network moved one step closer to linking all Ontario's schools and assorted other research institutions.

Phil Baker, ORION's president and chief executive officer, says the system directly connects 19 Ontario universities -- every one in the province except 1,250-student Royal Military College in Kingston -- and 20 of 24 colleges. Six teaching hospitals in Toronto and London, more than a dozen school boards and several other institutions, such as the Royal Conservatory of Music in Toronto and the National Capital Institute of Telecommunication in Ottawa, also use it.

ORION is important because it offers an enormous amount of reliable bandwidth compared with the often unpredictable conditions of the public Internet. It provides at least 10 gigabits per second of data capacity, with 30 megabits in some segments, and is expandable to 320 gigabits when needed. Bell Canada, Ontario Hydro Telecom and various public utilities throughout the province provide the fibre.

ORION also links to CA*net 4, Canada's national high-speed research network, at Toronto and Ottawa, and to Réseau d'informations scientifiques du Québec, its Quebec counterpart, in Ottawa. Through CA*net 4, it gives users access to other high-speed research networks in other provinces and around the world.

Mr. Baker says ORION helps Ontario researchers collaborate, connects them to unique facilities and supports distance education. It's also the conduit for cutting-edge research.

For instance, the Sudbury Neutrino Observatory, built at the bottom of a mineshaft, detects particles emitted by the sun and dark matter, offering clues to the origin of the universe. Its equipment can be controlled from Queen's University, which oversees the facility. ORION also carries data from the observatory to Queen's in Kingston and other universities.

Because it is buried deeper than similar observatories in France and Hawaii, researchers around the world want to use a new laboratory being built on the site for their experiments, says the observatory's director, Dr. Arthur McDonald. Through ORION and other networks to which it connects, they can control their experiments from almost anywhere.

Connecting to ORION will allow Georgian College to make computing facilities at the Industrial Research Development Institute on its Midland, Ont., campus accessible to researchers elsewhere, says Robert Emptage, Georgian's dean of engineering technology and applied research.

St. Lawrence College is already using ORION to share lectures with other colleges and among its own Kingston, Brockville and Cornwall campuses by video conference. Such video conferences previously used the public phone network.

"It's a whole lot cheaper, of course, using ORION," says Gord MacDougall, vice-president of education and information technologies, chief information officer and registrar at St. Lawrence.

Startup funding from the Ontario government and Canadian Advanced Network for Research, Industry and Education -- the operator of CA*net 4 -- got ORION off the ground. Institutions pay to use it according to a three-tier, flat-fee structure based on their size, Mr. Baker says. ORION chose that approach rather than charging for usage to ensure the cost of bandwidth would not be an obstacle to research, he says.

What that means, says Dr. Kerry Rowe, vice-president of research at Queen's, is that "researchers can just do it, without worrying about how to achieve connectivity."