

## Ontario research may lead to light-based "supercharged" Internet



A ground-breaking research team based in Ontario is drawing international attention with findings showing that nanotechnology can be used to pave the way to a supercharged Internet based entirely on light.

The discovery by University of Toronto Professor Ted Sargent and colleagues here and at Ottawa's Carleton University may lead to a network that relays signals around the globe with picosecond (one trillionth of a second) switching times, 100 times faster than today's Internet.

In a study just published in Nano Letters, Professor Sargent and colleagues advance the use of one laser beam to direct another with unprecedented control, a feat needed inside future fibre-optic networks.

"This finding showcases the power of nanotechnology: to design and create purpose-built custom materials from the molecule up," says Sargent, a professor at U of T's Edward S. Rogers Sr. Department of Electrical and Computer Engineering.

Until now, engineering researchers have been unable to capitalize on theoreticians' predictions of the power of light to control light.

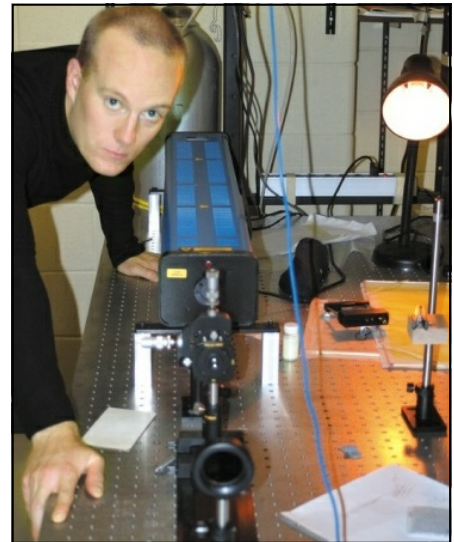
The paper addresses a limit originally predicted by Washington State University theorist and physicist Professor Mark Kuzyk, who now gives full credit to the Ontario team for succeeding where all other researchers have failed.

The failure of real materials to live up to their theoretical potential has become known as the "Kuzyk quantum gap" in molecular nonlinear optics.

Molecular materials used to switch light signals with light have, until now, been considerably weaker than fundamental physics say they could be," says Sargent.

"With this work, the ultimate capacity to process information-bearing signals using light is within our practical grasp." To breach the Kuzyk quantum gap, Carleton University chemistry professor Wayne Wang and colleague

*(Continued on Page 6)*



Prof. Ted Sargent

### ABEL success story embraced nationally



An Ontario broadband educational success story, now fully embraced in Alberta and elsewhere, is having a measurable impact on the way teachers are incorporating technology and broadband connectivity in the classroom.

Advanced Broadband Enabled Learning (ABEL), an innovative program housed at York University, seeks to improve student success and transform teacher professional practice through the use of broadband technology in schools in Canada.

Over 100 educators from the K-12 and post secondary institutions joined ABEL at its annual Summer Institute. The theme for this year's conference, in Canmore, Alberta, was a call to action to "Innovate, Collaborate and Transform."

Teachers, administrators, researchers and faculty collaborated between new and existing sites. With an emphasis on broadband collaborative tools, participants created projects in areas such as Science, Math, English, Leadership and the Arts that will continue to transform the way education is delivered to their students.

"The energy and excitement of all participants was paramount to the success of the three day institute," said ABLE Project Manager Janet Murphy, who has led the project since its inception in 2002.

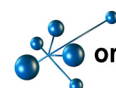
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The ORION Research and Discovery News is a monthly electronic publication providing news and information of interest to users of the Ontario Research and Innovation Optical Network and to the worldwide research and education community.



"The future of bandwidth-hungry video"

# First HD video transmission between desktops



ResearchChannel is reporting the first successful transmission of full bandwidth High Definition (HD) 1080i video between two desktop computers using high speed networking technology.

The transmission was achieved at a demonstration at the Asia Pacific Advanced Network (APAN) conference in Cairns, Australia in July. Conference attendees were treated to three HD video clips streamed at a sustained data rate of 1.5 gigabits per second.

"The emergence of a cyber platform of performing arts, for example, has become immediate," says Dae Young Kim, professor at Chungnam National University in Daejeon, South Korea,

*"The ability to transmit uncompressed High Definition video is one of a number of exciting uses of broadband networks and brings new opportunities ..."*

and CEO of Advanced Network Forum (ANF), a voluntary nonprofit community for users of research and education networks in Korea.

"The demo exemplified the future of bandwidth-hungry video transmission and applications."

This development demonstrates the possibility in the near future of a whole range of applications including new opportunities in telemedicine, remote sensing instrumentation and digital cinema using advanced networks at speeds of over 3,000 times those of commercial broadband networks or more than 40,000 times the speed of DSL.

"The ability to transmit uncompressed High Definition video is one of a number of exciting uses of broadband networks and brings new

opportunities not only for scientists but for a wider audience of viewers around the world," says George McLaughlin, director of international developments for Australia's Academic and Research Network (AARNet).

available at Internet2, cable, DSL and modem bandwidths.

ResearchChannel also actively tests new technologies to create robust, high-speed channels serving scientific communities.



**ResearchChannel**

Here in Canada, Ryerson University's Rogers Communications Centre in Toronto is emerging as a leader in research in high definition and digital video production.

Ryerson, one of the institutions connecting to ORION through

AARNet is cooperating with Research Channel to implement High Definition streaming into the new AARNet 3 network, which will provide high-speed access across the Australian continent to serve the needs of the research and education community in that country.

The technology for this experiment was developed by engineers at the University of Washington, a ResearchChannel participant, and demonstrated a previously unattainable level of reliable data traffic between two Windows XP platform computers.

The uncompressed HD files for the test were stored on two PCI-X Dual 2.8GHz XEON computers donated by Intel Corporation of Beaverton, Ore. A Xena HD video capture board donated by AJA Video Systems of Grass Valley, California, generated the video output.

ResearchChannel is a non-profit organization founded in 1996 by a consortium of leading research universities, institutions and corporate research centers dedicated to creating a widely accessible voice for research through video and Internet channels.

It currently broadcasts a full schedule of live and streamed educational programming 24/7, with content from throughout the world, including some offerings from Canada's National Film Board.

The content is open to all, at various connection speeds.

Audiences worldwide have access to ResearchChannel's continuous webcast and searchable on-demand video library of over 1300 full-length programs. These resources are

the GTAnet consortium, claims Canada's first systematized HD television editing facilities for use in education and the largest deployment of HDTV in Canada, with seven Panasonic AJ-

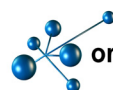
*Ryerson University's Rogers Communications Centre is emerging as a leader in research in high definition and digital video production ...*

HDC20A HD camcorders in the field. As a result, Rogers Centre is currently finding itself at the forefront of digital broadcast technology.

ORION is currently collaborating with ResearchChannel and others to identify potential Canadian and Ontario-based research and educational partners.

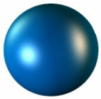
ORION hopes to spark interest among partners to connect to ORION for collaborative research and to make more of educational resources and programming available over the network here in Ontario and around the world.

For more information, visit the channels' site at [www.researchchannel.org](http://www.researchchannel.org) or the Rogers Centre site at [www.rcc.ryerson.ca](http://www.rcc.ryerson.ca)



"A catalyst for collaboration ..."

# Champion of Open Source - KMDI aims for human-centered design of technology



When radio and moving pictures came along, society took the new technologies in stride. Initially, even television didn't overly complicate our lives. Today, in addition to the "500 channel universe", knowledge media is increasingly pervasive and digital: remote access databases, Internet, Intranet, PDAs, WiFi, video conferencing, webcasting, interactive graphics, virtual reality environments, artificial intelligence.

Our ability to think, communicate, learn, and create knowledge is increasingly mediated by technology. It's not a question of too much or too little technology; it's about how appropriate the technology is for our skills, needs and circumstances.

As technology evolves ever faster, can individuals and society adapt to keep pace? Can the technology be designed with a more humanistic focus?

Bold, innovative, forward-thinking and uniquely Canadian, the University of Toronto's Knowledge Media Design Institute (KMDI) takes a constructively critical look at how technology both shapes and is shaped by people's interactions with it. Their goal is the human-centered design of technology.

The institute is a catalyst for collaboration on a variety of research and design projects that pull together teams from among 65 faculty members and 25 disciplines in science, social sciences, humanities and professional schools.

Through the development of innovative partnerships with other universities, the private sector, non-profit organizations and government, the institute is also taking an active role in the shaping of public debate and the development of public policy.

KMDI's recent Open Source Conference in Toronto is an excellent example of where the institute is coming from and where it plans to go. The conference was the first of its kind in Canada, and the most comprehensive ever held anywhere.

Unlike similar events on this subject which tend to focus on technical aspects of software code and its production, this conference took the approach that open source is a social movement with moral, legal, political, technical and business implications.

"KMDI is at the forefront in focusing on the interdisciplinary aspects of the 'Openness Movement'," said Gale Moore, a sociologist and Director of KMDI. "This is no longer a radical or fringe idea. It's rapidly becoming

mainstream and those who are not part of the leadership will miss opportunities. KMDI is positioned to take a leadership role."

The notion that everyone benefits by sharing is, for some, primarily a statement on the dominance of companies like Microsoft; for others, it's about building a community of knowledge from which innovation and freedom can flourish.



KNOWLEDGE  
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"It is a myth that successful businesses have to maintain proprietary control of their product and marketplace in order to be successful" said Bob Young, CEO co-founder of the world's most successful alternative software company Red Hat. "Innovation is ultimately the key to success for any business. Closed systems actually discourage innovation."

KMDI also intends to walk the talk through an open source release of ePresence, the interactive webcasting and archiving system developed by their ePresence Lab. A Consortium has been formed to take this forward and membership is growing.

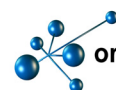
"The practice of education is changing as educators begin to think in terms of using more visual materials in courses and as a variety of new and different content management systems become available," explains Moore.

"One of our goals at KMDI is also to design and build technologies in a way that respects peoples' needs, and to adopt a more inclusive design practice that involves not only experts from different fields but the people who will eventually use these applications."

KMDI has consistently beta-tested ePresence by using it to webcast their own lectures, garnering a world audience in the process. "One European group said to us 'we love your lectures but we love your software even more'," recalls Moore. They are now members of the ePresence Consortium.

A successful open source release will put KMDI in the company of universities such as the Massachusetts Institute of Technology (MIT), Michigan, Indiana, and Stanford. KMDI is receiving legal support from UofT and are fortunate to have the U of T's Adaptive Technology Research Centre, a recognised leader in open source as a partner in this project.

For more information on KMDI, visit the Institute's web site at [www.kmdi.org](http://www.kmdi.org). A multimedia archive of the full conference has now been released and is openly available at <http://osconf.kmdi.utoronto.ca>



## "The Science Village"

# Timmins seeks its own regional science centre



A Timmins group has obtained \$100,000 in support to explore the feasibility of a new permanent science exhibit in Timmins, with satellite locations throughout northeast and northwest Ontario.

Dubbed the Science Village, the project is spearheaded by Science Timmins, a local group of educators, science and industry representatives. FedNor and the District School Board Ontario North East are among the organizations that have also contributed towards the cost of the study.

The facility would be comprised of a cluster of themed huts, interconnected by underground tunnels. The Village would have remote sites in Moosonee, Hearst, Kapuskasing, Cochrane, Iroquois Falls, Kirkland Lake and the Tri-Town, ideally connected by broadband, perhaps connecting to ORION through the Timmins PoP at Northern College. A "science bus" would also travel to different locations.

Timmins, located in a relatively pristine part of the Canada, is nearly 700 kilometres north of Toronto. The Science Village would be unique, conceptualized from a perspective that embraces conservation awareness and ecological balance, while being energy efficient, environmentally friendly, and "close to nature". Theme areas include forestry, mining, the environment, meteorology, horticulture, wildlife, waste management and First Nations.

Public support for the project was evident at a public information session at Ecole Secondaire Theriault in Timmins, in April, where Timmins Science outlined a detailed proposal and action plan. Proponents expect the Science Village would become the region's focal point for major science fairs, demonstrations and competitions. It would also become a major tourist attraction that would offer hands-on and interactive exhibits.

They also expect the facility, which would seek to collaborate with Science North, the Ontario Science Centre and other partners, would become a showcase for technology, science and research for the region, and provide valuable curriculum support for educators.

Project spokesperson Antoine Garwah notes the group would also like to see the project expand to northwest Ontario to communities stretching to the Manitoba border. The group hopes to obtain financial support from the three levels of government, including FedNor and the Northern Ontario Heritage Fund. The private sector and local and regional educational institutions will also be approached.

The feasibility study would be completed in December, while sources of funding would be secured in 2005, for possible construction and completion in 2008-2009. Learn more at [www.trsf.org/trsf2004/village/SVInfo4.htm](http://www.trsf.org/trsf2004/village/SVInfo4.htm)



## ABEL success story embraced nationally

*(Continued from page 1)*

Feedback from participants was indicative of the transformation that technology is bringing to Canada's educational environment. "I now know the possibilities of videoconferencing and have a community of support to call upon," said one Alberta teacher.

One Ontario teacher, participating over a broadband connection, said, "collaboration is the best part. The opportunity to build on new ideas, and continue to improve is invaluable."

While the original CANARIE funding for the ABEL initiative wrapped up in March, the ABEL model continues to evolve with its focus on educational practitioner, job-embedded, professional development.

Professional development opportunities exist through ABEL university partner institutions (York University, University of Alberta, Seneca College) and have recently expanded to include the University of Calgary, graduate division of Educational Research.

Acadia University has also joined ABEL and is contributing to professional learning opportunities and expertise.

ABEL is led by York University's Office of Research and Innovation and includes public and private partners, including ORION.

Educators who are interested to joining or participating in the program are encouraged to get in touch with Ms. Murphy directly. For contact information, program information and highlights, visit the ABEL web site at [www.abelearn.ca](http://www.abelearn.ca).



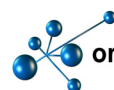
## NEWS BRIEFS

### Pharmaceutical donates mass spectrometer

A leading pharmaceutical has donated a \$300,000 high-resolution mass spectrometer to the University of Waterloo's Department of Chemistry. The donation by Merck Frosst Canada & Co. will support health, biochemical and biomaterials research at the university. "This is a wonderful example of the university-industry synergy that is now so critical in furthering fundamental research in Canada," said UW President David Johnston. "Merck Frosst supports excellence in research in Ontario through a number of important donations, grants and fellowships. This particular donation is another tangible example of private sector investment in Canada's research community," said Dr. Robert Young, Merck Frosst Vice-President of Medicinal Chemistry. Mass spectrometry is one of the most powerful techniques for determining the structure of new chemical and biochemical molecules and entities.

### Rock shelters are "biggest story never told"

Why are penthouse apartments the most coveted and expensive? New research published by Guelph University botanists argues that cliffs and rock shelters have played a vital role in the evolution of humans. "The seeds of the concrete canyons, urban centres, suburbs and farms of our own creation were sown a million years ago," says professor Douglas Larson, of the Cliff Ecology Research Group. He and associates Uta Matthes, Peter E. Kelly, Jeremy Lundholm and John Gerrath have just published "The Urban Cliff Revolution", which concludes that our species is as dependent on cliffs and rock shelters today as we have been for the past million years. "We're the first ones to put the entire story together showing the broad array of effects created by people having exploited rock shelters. It's the greatest story never told," he says. Throughout human evolution, cliffs and their associated rock shelters and caves have provided safe refuge from harsh natural environments and predators. "When humans started making dwellings, we copied the features of caves. Locations we prefer today, like corner offices or a penthouse apartments, have the same qualities that were found more desirable in the rock shelters of our ancestors, he says." Learn more at [www.uoguelph.ca/botany/index.htm](http://www.uoguelph.ca/botany/index.htm)





## ORION News Briefs

### Support "Jeans for Genes with cool pin

An ultra-cool pin, showing "blue jeans morphing into a double-helix" will be the hottest accessory on Thursday, September 23, this year's designated Jeans for Genes Day in Canada. The program is the only national annual fundraising event dedicated to supporting and promoting research into the causes and treatment of, and cures for genetic diseases that affect children. People across Canada in companies, hospitals, universities and schools wear jeans to work and receive a Jeans for Genes Day pin for a minimum \$5 donation. Up to 50% of admissions to pediatric hospitals are for genetic diseases. All of the money raised goes towards research into genetic diseases that affect children such as Muscular Dystrophy, Cystic Fibrosis, Juvenile Diabetes, Down Syndrome, Epilepsy and many others. Over \$320,000 has been raised since the program started, in 1999. After each Jeans for Genes Day campaign, the Canadian Gene Cure Foundation circulates a Request for Applications (RFA) to Canadian scientists who specialize in childhood genetic diseases. An accredited panel of scientists judge the proposals based upon the excellence of the research and the funds are distributed accordingly. The competition is open to all researchers who meet the guidelines set by the Canadian Institute for Health Research. Dr. Eyal Grunebaum, a researcher with the Hospital for Sick Children received \$40,000 from the proceeds of last year's campaign, for instance. To donate or to get involved, visit [www.jeansforgenes.ca](http://www.jeansforgenes.ca)



### CANARIE promotes uptake of projects

CANARIE is inviting the broad research and education community to a series of workshops to show the results of the projects its has funded over the years, and to help the projects move forward by encouraging uptake of the initiatives. Project leaders will present their achievements and future plans to potential customers, strategic partners, investors, adopters and funders. The initiatives to be profiled - many in Ontario - represent some of Canada's most innovative and ground-breaking projects, involving collaboration between researchers, educators and industry. The events are scheduled for Halifax, Vancouver and Toronto, starting in Halifax September 7. Over 40 exhibitors are already confirmed for the Toronto session, Nov. 3 and 4 at the Toronto Congress Centre. Learn more and download description of the projects and workshop agenda at [www.canarie.ca](http://www.canarie.ca)

### Learning from video games technology

Can video game technology be applied in areas of legitimate e-learning? That was one of the more intriguing themes explored at this year's Summer Institute on Learning Technologies.

Some 30 senior educators and officials from throughout Ontario participated in the annual three-day workshop, presented by the Office for Partnerships for Advanced Skills (OPAS). Now in its sixth year, the workshop is meant to assist university and college instructors in improving their teaching through the use of new technologies. Participants receive information on new approaches and "hands-on" experience with developing learning products. Hosted by Sun Microsystems at its Markham headquarters and co-sponsored by IBM, this year's event looked at the impact of learning technological applications on higher education. It also sought ideas to help shape future directions and projects in e-learning. In a session on the use of broadband technology in teaching and learning, ORION President and CEO Phil Baker called on the participants to champion the use of ORION and collaboration over global research and education networks at their institutions. "This is your network," he said. OPAS also presented awards for innovation in e-learning content. Recipients included Gail Ecker & Virginia Gray of the University of Guelph, Christian Blanchette of the University of Ottawa, and Gwen Wojda of Lakehead University. Dr. Jan Donio, Director Learning Technology for OPAS, said "the OPAS summer institute is one of the few venues where industry and university e-learning experts focus on how innovations in technology can improve teaching and learning." Learn more at the OPAS web site at [www.opas-partnerships.com](http://www.opas-partnerships.com)

### David Lindsay new president of ACAATO

David Lindsay, former Principal Secretary to the Premier, is the new President of the Association of Colleges of Applied Arts and Technology of Ontario (ACAATO). "We are pleased to have an experienced and dedicated public servant of David's caliber join us at ACAATO. Mr. Lindsay's experience as former President of the Ontario Jobs and Investment Board will be invaluable as the college system helps advance the important skills training and economic development agenda in communities across the province, said Dr. Rick Miner, President of Seneca College and Chair of ACAATO's Committee of Presidents. Prior to joining ACAATO, David Lindsay was the President of the Ontario SuperBuild Corporation for four years. He spent a total of 20 years at Queen's Park including more than two years as Principal Secretary to the Premier from June 1995 to September 1997. Ontario's college system serves 200 communities, employs about 30,000 people, serves about 150,000 full-time and 350,000 part-time students annually and has more than one million graduates. Most of Ontario's colleges of applied arts and technology and college institutes of technology and advanced learning are already or will soon connect to the ORION network.

### Contact North launches e-learning platform

Colleges and Universities Minister Mary Anne Chambers and Northern Development and Mines Minister Rick Bartolucci joined students and community leaders in Sudbury and Thunder Bay August 9, as the first learners to participate in a virtual classroom hosted by Contact North's new real-time e-learning technology platform, powered by Centra Software. ORION President and CEO Phil Baker was on hand and ORION Project Director Sam Mokbel participated by teleconference from Toronto. ORION provides the connec-

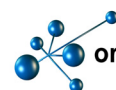
tivity between Thunder Bay and Sudbury to support the new e-learning platform. The new platform brings together voice, video, data, graphics and other rich multimedia and tools to facilitate interactive group learning and collaboration over the Internet. "Distance education is a cost-effective way to provide access to education and training programs in more than 100 small and remote communities across Northern Ontario," notes Maxim Jean-Louis, President & Chief Executive Officer of Contact North. For many communities, Contact North is the only means to access post-secondary education opportunities without having to leave their communities. It provides an opportunity for learners to pursue their education goals and upgrade their skills while continuing to make an economic and social contribution to their community. In addition to the new learning platform, new computer workstations have been installed in each of Contact North's access centres, located in more than 100 small and remote communities across Northern Ontario. The new service will be available starting in September.

### Results of E-Health program

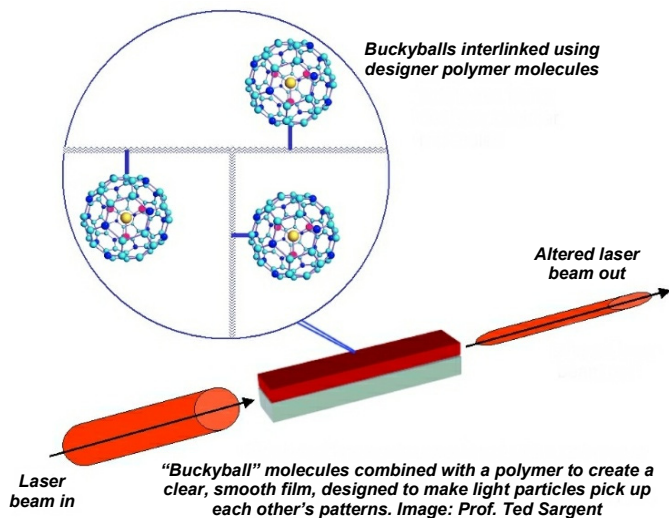
Reporting back on the success of its E-Health Program, from which funded projects "have changed the way healthcare is delivered in Canada," CANARIE has released a report on the CANARIE and Canada Health Infoway "Models of Telehealth" Workshop in Montreal earlier this year, which showcased the results of the projects. Some 21 projects were funded under the CANARIE funding program, launched in 1999, to facilitate the development of innovative, leading-edge medical and health-related applications. The CANARIE Program came to an end March 31, as Canada Health Infoway Inc. began initial investments within its Telehealth mandate. CANARIE and Canada Health Infoway co-hosted the 'Models of Telehealth' Workshop in Montreal earlier this year, to showcase the results of 21 E-Health Projects. The purpose of the workshop was to learn what was accomplished, what benefits were realized, and what lessons, advice and knowledge should be shared with the next generation of Telehealth users and developers. The workshop report, which outlines findings from the projects, can be downloaded at [www.canarie.ca/conferences/telehealth/index.html](http://www.canarie.ca/conferences/telehealth/index.html)

### US funds middleware in fight against Alzheimer's

Financial support from the National Science Foundation (NSF) is helping develop middleware to support groups of researchers in neuroscience, physics and other fields to apply the power of grid-based computational resources in the study of Alzheimer's disease and the analysis of particle collisions. Spanning 14 universities and 22 research groups in the US, the growing Biomedical Informatics Research Network (BIRN) is establishing the cyberinfrastructure, or integrated information technology configuration, needed to facilitate health care research for large-scale data sharing and analysis. The ability to share and compare massive data sets such as MRI brain scans or high-resolution electron microscopy images is essential to participants' research into Alzheimer's disease, depression, schizophrenia, multiple sclerosis and other disorders. Learn more at [www.nsf.gov/od/lpa/newsroom/pr.cfm?ni=101](http://www.nsf.gov/od/lpa/newsroom/pr.cfm?ni=101)



# Ontario research may lead to light-based "supercharged" Internet



(Continued from Page 1)

Connie Kuang designed a material that combined nanometre-sized spherical particles known as "buckyballs" (molecules of carbon atoms resembling soccer balls) with a designed class of polymer. The polymer and buckyball combination created a clear, smooth film designed to make light particles pick up each other's patterns.

Sargent and U of T colleague Qiyang Chen then studied the optical properties of this new hybrid material.

They found that the material was able to process information carried at telecommunications wavelengths - the infrared colours of light used in fibre-optic cables.

"Photons - particles of light - interacted unusually strongly with one another across the set of wavelengths used for communications," says Sargent. Calculations based on these measurements reveal that we came closer than ever to achieving what quantum mechanical physics tells us is possible." According to Sargent, future fibre-optic communication systems could relay signals around the global network with picosecond (one trillionth of a second) switching times, resulting in an Internet 100 times faster.

To do this, they need to avoid unnecessary conversions of signals between optical and electronic form. Says Sargent: "By creating a new hybrid material that can harness a light beam's power, we've demonstrated a new class of materials which meets the engineering needs of future photonic networks."

Kuzyk was the first to predict the fundamental physical limits on the nonlinear properties of molecular materials in 2000 and says that by approaching the quantum limit, the U of T-Carleton team has succeeded where others failed.

"The report on reaching the quantum limit by the Toronto and Carleton team of researchers is a major advance in the science of nonlinear optical materials that will impact directly many important technologies," says Kuzyk.

The research was supported by the Ontario Research and Development Challenge Fund, Nortel Networks, the Natural Sciences and Engineering Research Council of Canada, Canada Research Chairs Foundation, the Canada Foundation for Innovation and the Ontario Innovation Trust.

Professor Sargent outlined the broad scope of his ongoing research, as one of the star presenters at ORION's own Ontario R&E Summit, on June 15 here in Toronto. His presentation may be downloaded at [www.orion.on.ca/ppt/sargent.ppt](http://www.orion.on.ca/ppt/sargent.ppt). Learn more at <http://light.utoronto.ca/tsargent>



## NEWS BRIEFS

### UOIT professor designs Anik F2 payload

Oshawa's University of Ontario Institute of Technology (UOIT) has bragging rights this summer as one of its own celebrates the recent launch of Telesat Canada's \$600M Anik F2 - the world's largest and most powerful commercial communications satellite. Dr. Ali Grami, associate professor at UOIT's Faculties of Engineering and Applied Science and Business and Information Technology and former senior advanced systems specialist at Telesat Canada, was lead researcher and principal designer of Anik F2's advanced Ka-band satellite payload. Anik F2 is the first satellite to fully commercialize the Ka frequency band, a breakthrough satellite communications technology for delivering cost-effective broadband interactive multimedia services. Anik F2 will extend the reach of high-speed Internet services to areas un-served or under-served by terrestrial networks, all across North America. Ottawa has pledged to make Canada the world's "most connected" nation and plans to provide connectivity to far and mid-north communities. High-speed service will be available to consumers after testing, in about three months. Dr. Grami's research interests are in satellite, wireless, and multimedia communications. He received his Ph.D., M. Eng., and B.Sc. from the University of Toronto, McGill University, and the University of Manitoba respectively, all in Electrical Engineering.

### McMaster signs on to Flintbox to market early stage research

Hamilton's McMaster University is the latest institution to sign on to the Flintbox platform, a new service dedicated to marketing and licensing the outcomes of research in Canadian universities. An online platform for facilitating the sharing of early stage research results between collaborators in and around publicly funded research institutions, Flintbox technology was developed at the University of British Columbia and launched in 2001. Flintbox director of licensing Bob De Wit says that prior to Flintbox, as much as 98 per cent of all research results - "non-patentable stuff" - was effectively ignored by existing technology transfer practices. "Our thinking is that we needed to get something started for these types of research outcomes," he says. Through Flintbox, researchers can benefit from marketing, distribution and licensing of their inventions, no matter what stage of development. Products can be software, shareware, freeware or any other research material. For instance, users of the McMaster service can download a demo version of the Human Biochemistry CD ROM or purchase the course for a modest fee. The McMaster Algorithm for Freeway Incident Detection, developed under contract to the Ontario Ministry of Transportation, is licensed free to users. Other Ontario institutions licensed to use or have posted to Flintbox include the University of Guelph, the University of Ottawa and the University of Western Ontario. Find out more at [www.mcmasterflintbox.ca](http://www.mcmasterflintbox.ca).

## 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](http://www.orion.on.ca) or write the Editor at [info@orano.on.ca](mailto:info@orano.on.ca). Subscribe to this newsletter, visit [www.orano.on.ca/newsletter/subscribe.html](http://www.orano.on.ca/newsletter/subscribe.html)

