

# NCIT<sub>IN</sub> REVIEW 2005

NCIT Inc. (NCIT) is a Broadband Research  
Institute incorporated in November 2000



**NCIT·ITCN**

**NATIONAL CAPITAL INSTITUTE OF TELECOMMUNICATIONS**

# NCIT MEMBERS

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## Other Participants

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Aglint Technologies Canada Inc.  
ANRITSU Electronics Ltd.  
Diatem Networks Inc.  
EION Inc.  
Foundry Networks  
Handshake VR Inc.  
Intelligent Photonics Control Corp.  
Juniper Networks  
Lightip Technologies Inc.  
MetroPhotonics Inc.  
MPB Technologies Inc.  
Navtel Communications  
NetTest Canada Inc.  
NI Solutions  
Peeta Consultants Inc.  
Peleton Photonic Systems Inc.  
Skyworks Solutions Inc.  
Spectalis Corp.  
US Computer Software Inc.  
Zenastra

Acunia Drives Telematics (France)  
AIC Limited  
Amazon.com  
Amex Bank of Canada  
Canada Life  
Canadian Imperial Bank of Commerce  
Canadian Magazines Publisher's Association  
Canadian Tire Acceptance Limited  
Cap Gemini Ernst & Young (France)  
Cognos Inc.

Community Care Access Centre  
Simcoe County  
DMR Consulting (USA)  
EC Innovations Inc.  
Enbridge Inc.  
GE Canada  
Goodman Phillips & Vineberg LLP  
Gowling Lafleur Henderson LLP  
Hewlett-Packard (Canada) Ltd  
Hitachi Canada Inc.  
John Deere Limited  
Labatt Breweries of Canada  
Link Logistics Inc.  
National Bank of Canada  
Osler, Hoskin & Harcourt LLP  
PeopleSoft Canada Co.  
PSA Peugeot Citroën (France)  
Renault (France)  
Reuters  
Saint Elizabeth Health Care  
SAP Canada Inc.  
Sears Canada Inc.  
Sprott Asset Management Inc.  
TD Bank Financial Group  
The Bank of Nova Scotia  
The Beal Fund of the Triangle  
Community Foundation  
The Law Foundation of Ontario  
Torys LLP  
TSX (Canadian Foundation for Investor Education)  
Zarlink Semiconductors

# MESSAGES

## Message from Dr. Howard Alper, Chair of the Board of the NCIT

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With this, the 2005 NCIT review, I am pleased to look back with pride over a unique experiment in multi-party collaborative research. The NCIT project that we started in 1999 had four main objectives: to undertake excellent research in the then emerging field of Internet communications;

to train highly qualified personnel to provide local and national leadership in this technological revolution; to create jobs and wealth for the province of Ontario; and to build sustainable research infrastructure including a live network, nine laboratories and an enduring Institute to manage collaborative research in the Ottawa cluster. We were aware from the outset that the NCIT would face some challenges bringing together the different research cultures of the Federal Laboratories, Universities, Colleges and private sector into coherent managed research initiatives including in the perennial issues of

intellectual property rights, deliverables and short term vs. long term objectives. We had not anticipated the wild fluctuations of the telecommunications market and the churn this engendered in both the private and the academic sectors. The NCIT not only weathered these difficult times but excelled in them fostering two new companies, several new products, over 160 graduate students and more than 300 papers. By the end of this project the NCIT will have grown from five founding private sector members to more than twenty five private sector research partners. There are many other accomplishments that may be seen at [www.ncit.ca](http://www.ncit.ca). We look now to a successful continuation of the initiative. With the formal completion of the NCIT project in December of this year the Institute itself will continue to pursue excellence in collaborative research management through other new initiatives that I will leave to Robert to expound on below. My heartfelt thanks go out to everyone who has contributed to the success of this venture so far.

## Message from Dr. Robert Crawhall, President of the NCIT

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September of 2005 finds the NCIT in the middle of the first open call for proposals for the Ontario Research Network in Electronic Commerce. With more than \$2.0M of funding available to the faculties of law, business and engineering at the four participating universities ([www.ornec.ca](http://www.ornec.ca))

we are receiving many exciting expressions of interest in eBusiness, eHealth and on-line security with a particular emphasis on Identity Theft. At the same time the NCIT is in the process of articulating a communications architecture through a collaboration of industry, academia and the federal laboratories. Known as CrISIS – Critical Infrastructure Systems Information Services, this architecture builds on the rapidly emerging global trends in sensor networking,

session-based call management (SIP) and XML routing. The CrISIS architecture forms a critical building block in the strategic research directions of both the University of Ottawa and Carleton University. Already well received by the private sector, this vertical integration of research activities into service and product concepts targeted at major commercialization opportunities will hopefully prove to be a critical differentiator in upcoming competitive research proposals. Alongside these foundational initiatives that could bring tens of millions of dollars into our research community over the five-year life of the project, we will be pursuing a number of smaller focused initiatives with prototyping programs from various federal and provincial departments to help create the channels to accelerate the conversion of excellent research into successful products and services. It is an exciting time at the NCIT. Building on our successes to date we look forward to a promising future.

NCIT started its activities in November 2000 with the management of the NCIT Project and the establishment of NCIT\*net and in October 2004 assumed management of the ORNEC Project

# HIGHLIGHTS



The NCIT (NCIT Inc.) is a research institute centered on the Ottawa High Tech Cluster, the NCIT establishes and manages multi-party collaborative research in Information and Communications (ICT) Technologies: new broadband multimedia applications and information services for telecommunications; eCommerce, eHealth and infrastructure systems information services (for applications in transportation, emergency preparedness, environment and security)

NCIT Project is a 5-year project started in November 2000 under the management of The NCIT to stimulate “Technologies-for-Broadband” research with strong focus on aligning Academic, Federal labs and Industrial research initiatives and on working with small industry partners allowing them low-risk participation in exploratory research in academic labs

NCIT\*net is an optical research network connecting Labs at sites of four Founding Members (University of Ottawa, Carleton University, NRC and CRC). It was commissioned by The NCIT during the year 2000 to provide unique telecom research capacity enabling research and development of pre-commercial applications at all layers/planes from physical to network to management and control.

NCIT Outreach Activities strengthens the research capacity of the Ottawa Cluster through the establishment of major research alliances in photonics (OPRA: Ottawa Photonics Research Alliance) and wireless (OWRA: Ottawa Wireless Research Alliance) in addition to workshops specialized in networking topics like MPLS and VoIP

ORNEC (Ontario Research Network for Electronic Commerce) was started in 2001 as a collaborative effort between the universities of Ottawa, Carleton, McMaster and Queen’s with a grant from ORDCF along with contributions from the four universities and from private sector partners in the technology, business and law sectors. ORNEC is under the management of the NCIT starting Nov. 2004. ORNEC runs till Dec 2007

# PROJECT SUMMARIES

The NCIT Project: With a total funding of \$41M (\$19.2M cash from ORDCF, CFI/OIT and industry partners along with \$21.5M in-kind from Universities, Industry and Federal labs), the NCIT established well-equipped labs, established NCIT\*net, educated and trained highly qualified people, developed IP and produced a large list of publications. The NCIT has attracted many members and project partners from academic institutions, government labs and Telecom industry. The NCIT engaged a large number of small industry partners allowing them low-risk participation in exploratory research in academic labs. The NCIT fostered two startups (Spectalis and eXRAY) and assisted 10 other startup companies with their product and business plans. The NCIT Project ends in Dec 2005.

*More in [www.ncit.ca](http://www.ncit.ca)*

NCIT\*net: Established in 2000 with a CFI/OIT funding of \$984k along with In-kind Contribution valued at \$1.6M from Bell Canada (five-year managed optical fiber donation). It was upgraded in 2004 to NCIT\*net2 to allow more wavelengths and more protocol capabilities using CFI/OIT funding of \$720k along with in-kind support from NCIT Partners valued at \$560k. A new 2.4M optical fiber donation from Telecom Ottawa obtained in 2005 expanded fiber connectivity to the four sites, added Algonquin College as a fifth site and will keep the network operational for 5 more years. This ensures that the research infrastructure enabled by NCIT\*net2 will continue as an independent self-sustaining optical networking research tool till Dec 2010.

*More in [www.ncct.uottawa.ca](http://www.ncct.uottawa.ca)*

ORNEC: Established in 2001 with a grant of \$13.4M from ORDCF along with \$26.8M in contributions from the four universities and private sector partners in the technology, business and law sectors. It is under the management of the NCIT starting Nov. 2004. ORNEC is the meeting place where Industry, Government and Universities conduct eCommerce research with the objectives to create scientific knowledge pioneer breakthroughs, new concepts, new business models and best practices in eCommerce law, business and technology. ORNEC contributes to the enrichment of a highly qualified pool of future academic and business leaders and to the economic growth and job creation by leveraging the effective and efficient transfer of knowledge and innovation to Canadian businesses. ORNEC ends in Dec 2007.

*More in [www.ornec.ca](http://www.ornec.ca)*

# PROJECT OUTCOMES

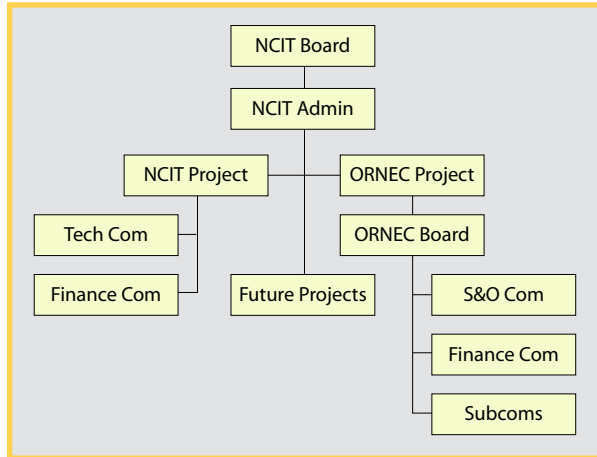
**The NCIT Project achievements along with the firm establishment of NCIT\*net2 leave a positive impact on the economy of the Region**

- Advances in a wide range of technologies across optoelectronics, networking, wireless and multi-media applications:
    - Established and completed 44 NCIT research and development projects at Ottawa, Carleton and Algonquin involving 64 Professors, 30 NRC/CRC Researchers, 52 Researchers from Industry and 4 Visiting Researchers from abroad.
    - Over 200 publications in fiber optics, wireless, networking and multi media communications
    - Ten patent disclosures (1 patent in VoIP technology in 2003, 1 patent on information transfer and privacy in eCommerce systems and 8 patents on RF microelectronics and laser modeling in 2005)
  - Effective education and training in state-of-the-art technologies of a significant number of highly-qualified people:
    - Postdoctoral Fellows who worked on the above projects of which 6 were awarded NCIT Fellowships along with 14 Research Associates contributing significantly to research capacity building.
    - 52 students completed their Doctoral Degrees, 112 students completed their Master's Degrees and 29 Undergraduate students trained.
  - Lasting research infrastructure in the form of new and upgraded laboratories equipped with latest test and measurement equipment to support research in optoelectronics, microwaves, wireless, internet protocols and multimedia applications.
  - NCIT\*net2 research infrastructure supporting research in internet protocols, management/control of optical networks and multi-vendor inter-operability testing. Further upgrades will enable testing of emerging photonic components and new optical protection-switching approaches for optical networks.
- ORNEC (Ontario Research Network for Electronic Commerce) is establishing and stimulating eCommerce research, education and training in Ontario**
- Increased research capacity:
    - 22 new faculty members including CRC Chairs and Industry Chairs (business, law and technology)
    - 39 Doctoral, LLM and LLB students
  - Established Infrastructure:
    - Expansion of McMaster's DeGroote School of Business
    - New Sprott Technology Center (eBusiness Lab and Electronic Trading Room) at Carleton
    - Establishment of CIPPIC (Canadian Internet Policy and Public Interest Clinic) at Ottawa Law School
    - New Law Library at Queen's Law School
  - Education and Training
    - Annual conferences covering eCommerce law and business (McMaster's Supply Chain management, McMaster's World Congress and Queen's Alliance Management)
    - Graduate level courses (Computing for Psychologists at Carleton, Network security and Architectures for eCommerce at Ottawa)
    - Training courses and seminars
    - Publications on eCommerce

# FUTURE PROJECTS

## CrISIS:

Combined research activity and dialog with both public and private sectors has given rise to a novel information and communication architecture coined "CrISIS: Critical Infrastructure Systems - Information Services". Based on emerging technology trends and standards, CrISIS will form the "Cyber Infrastructure" for major projects at NCIT member institutions including hazard mitigation and emergency preparedness and sensor systems for health monitoring, transportation, environmental, energy and security.



# NCIT GOVERNANCE

## NCIT Board of Directors

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Feridun Hamdullahpur, VP Research & International, Carleton University

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Veena Rawat, Acting President, CRC

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