



performance measures 2003

November 17, 2003

This is iCORE's second annual report on performance. It presents the results of iCORE's programs as of March 31, 2003.

iCORE began in January 2000 with the launch of the ICT Strategy, Planning and Recruitment Grants program, followed by the Chair and Professorship Establishment Grants and the Graduate Student Scholarships programs in March 2000. These programs were enhanced by the addition of the Industry Chair Establishment Grants in July 2001 and the Visiting Professor Grants in August 2002. These programs have been used to attract exciting and productive research talent to Alberta and are having a significant impact on the informatics research that is being performed in Alberta.

This performance measures report demonstrates the impact that iCORE has on Alberta's "innovation system". These performance measures present a broad range of academic, economic, intellectual property and social/recognition indicators that, taken together, give a picture of the impact of iCORE. The measures are collected in

the broad categories of: High Quality People, Economic Impact, Intellectual Property, Partnerships and Awards.

The main outputs of university research are High Quality People, in the form of graduate and undergraduate students, and Intellectual Property, in the form of research papers and patents. Economic Impact measures the additional research funding that is attracted by iCORE researchers and the number of spinout companies that are led or directed by iCORE researchers. Additional significant economic impact in the form of high value-added products and services is created through the graduate students who stay in Alberta and additional faculty and industries that are attracted to the province. This kind of economic impact is not yet reflected in our performance measures, as it is difficult to quantify at an early stage. At this time, the percentage of graduate students who intend on staying in Alberta is used as a proxy for the potential impact of this large group of very high quality people.

Summary of Performance Indicators

To gauge success, iCORE measures its performance in several major areas:

High Quality People	Number of iCORE Chair and Professor awards	13
	Number of additional faculty members on iCORE research teams	33
	Number of graduate students and postdocs on iCORE research teams	203
	Number of graduate student scholarships awarded to date	196
	Percentage of graduate students who intend on staying in Alberta after graduation	65
Economic Impact	iCORE investment	\$27.8 M
	Funding acquired directly by iCORE research teams	\$73.4 M
	Funding acquired with iCORE research team collaboration	\$121.3 M
	Spinout companies	4
Partnerships	Number of collaborations with researchers nationally and internationally	84
	Partnerships with industry	49
Awards	Number of major awards by iCORE researchers	14
Intellectual Property Produced	Refereed journals and conference papers	360*
	Books or chapters	16
	New patents	5

**this number includes some duplicates that were co-authored by more than one iCORE researcher*

High Quality People

RESEARCH TEAMS

The total number of researchers actively engaged on iCORE research teams has grown to almost 350.

13 research awards have been funded as of March 31, 2003:

NETWORKS AND WIRELESS COMMUNICATIONS

- Norman Beaulieu, Electrical and Computer Engineering, U of A iCORE Chair, *iCORE Wireless Communications Laboratory*
- Graham Jullien, Electrical and Computer Engineering, U of C iCORE Chair, *Advanced Technology Information Processing Systems*
- Gérard Lachapelle, Geomatics Engineering, U of C iCORE Chair, *Wireless Location Research Group*
- Hugh Williams, Mathematics and Statistics, U of C iCORE Chair, *Algorithmic Number Theory and Cryptography*
- Christian Schlegel, Electrical and Computer Engineering, U of A iCORE Professor, *High-Capacity Digital Communications Laboratory*
- Carey Williamson, Computer Science, U of C, iCORE Professor, *Broadband Wireless Networks, Protocols, Applications and Performance* AND iCORE/Telus Mobility Industrial Chair, *Wireless Traffic Modeling and Simulation*

- Jim Haslett, Electrical and Computer Engineering, U of C iCORE/TRLabs/NSERC Industrial Chair *Wireless Science and Technology Initiative*

NANOSCALE AND QUANTUM INFORMATICS

- Michael Brett, Electrical and Computer Engineering, U of A iCORE Professor, *Nanoscale Engineering Physics Initiative*
- Mark Freeman, Physics, U of A iCORE Professor, *Nanoscale Engineering Physics Initiative*
- Robert Wolkow, Physics, U of A iCORE Chair, *Nanoscale Information and Communications Technology*

INTELLIGENT SOFTWARE SYSTEMS

- Jonathan Schaeffer, Computing Science, U of A iCORE Chair, *High-Performance Artificial Intelligence Systems*
- Günther Ruhe, Computer Science /Electrical and Computer Engineering, U of C, iCORE Professor, *Software Engineering Decision Support*

Number of faculty members on iCORE research teams

33 additional research associates and collaborators

Number of graduate students and postdocs on iCORE research teams

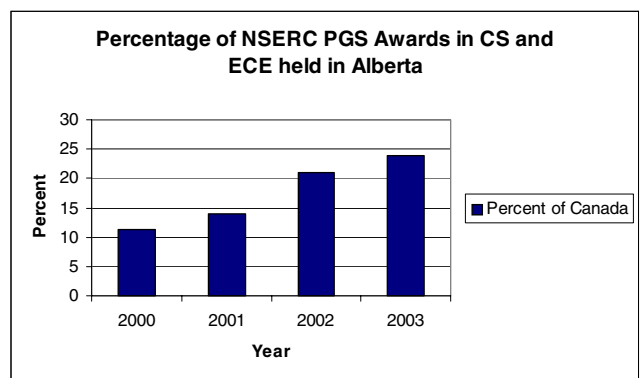
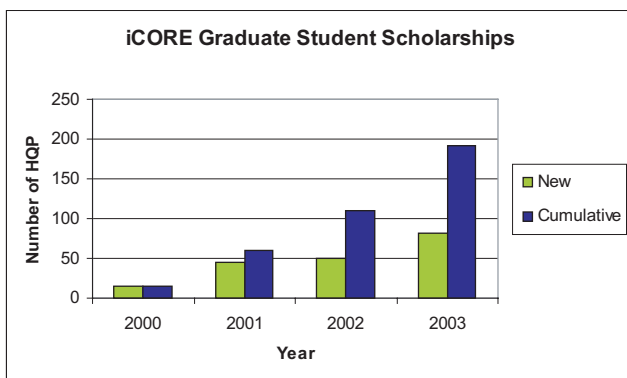
203

Number of other team members

95

GRADUATE STUDENTS

To date, 196 graduate students holding NSERC awards (or equivalent) in the areas of computer science and electrical and computer engineering have been attracted to and funded in Alberta by complementary iCORE graduate student scholarships. These students represent the highest achieving Canadian students. Alberta's percentage of Canada's NSERC graduate student awards in computer science and electrical and computer engineering has increased from 11.3 percent before iCORE started in 2000, to 24 percent in 2003 – a significant accomplishment in three years.



Percentage of graduate students who intend on staying in Alberta after graduation

In its 2003 survey of the students supported by iCORE, 65 percent of students intend on staying in Alberta after graduation.

Economic Impact

iCORE's economic impact at this time is measured by the amount of additional research funding that is attracted and leveraged by iCORE funding. iCORE has been very successful in attracting research investment to Alberta. For every dollar that iCORE has invested, the excellence of the people and the confidence around the research program has led to the investment of an additional eight dollars from other sources. This significant increased input into R&D activity in Alberta will cause other activity and impact in the broader Innovation System.

iCORE investment to date		\$27.8M
Funding acquired directly by iCORE research teams		\$73.4M
Federal	Canada Foundation for Innovation Canada Research Chair Natural Sciences and Engineering Research Council	\$19.1M \$7.5M \$4.8M
Provincial	Universities Alberta Science and Research Authority	\$2.3M \$11.3M
Industry	Private sector partners	\$22.4M
Funding acquired with iCORE research team collaboration		\$121.3M
Federal	National Research Council	\$61.3M
Provincial	Alberta Innovation and Science	\$60.0M
Direct Leverage		3.6 times
Direct and Indirect Leverage		8.0 times
Spinout companies		4

High Quality Vision

iCORE is guided by a group of successful and experienced visionaries who make up the ICT Research Advisory Committee and iCORE's Board of Directors.

iCORE Research Advisory Committee

The iCORE Research Advisory Committee (IRAC) is made up of five members who have extensive academic and industry research experience in a range of information and communication technologies. These five scientists and industry experts from around the globe were assembled as a select group to advise iCORE on future directions. Members include:

- DR JAMES GOSLING
Chief Scientist, Java, Vice President and Fellow, Sun Microsystems
- DR DAVID JEFFERSON
Computer Scientist, Lawrence Livermore National Laboratory
- DR ERIC GEORGE MANNING
Professor, University of Victoria
- DR WILLIAM R. PULLEYBLANK
Director of IBM Exploratory Systems, IBM Research
- DR RICHARD E. TAYLOR
Professor, Stanford University, Nobel Laureate

iCORE Board

iCORE's high-profile board of directors is selected from experienced industry, government and academic leaders. Board members include:

- BARRY MEHR
Deputy Minister, Alberta Innovation and Science
- DR PETER C. FLYNN
Poole Chair in Management for Engineers, Faculty of Engineering, University of Alberta
- DR PETER HACKETT
Vice President Research, National Research Council
- H.S. (SCOBEEY) HARTLEY
Consultant
- MARY HOFSTETTER
President & CEO, The Banff Centre
- DR GARY KACHANOSKI
Vice President (Research), University of Alberta
- DR SEAMUS O'SHEA
Vice-president (Academic) and Provost, University of Lethbridge
- DR WILLIAM PULLEYBLANK
Director, IBM Deep Computing Institute
- DR DENNIS SALAHUB
Vice President (Research), University of Calgary
- J.R. (ROLF) SHERLOCK
Consultant
- MONICA SLOAN
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- DR ROGER S. SMITH
Emeritus Professor, School of Business, University of Alberta
- DR BRIAN W. UNGER
President and CEO, iCORE
- SAMUEL ZNAIMER
Senior Vice President, Ventures West

Partnerships

Collaborations are an endorsement by other researchers that a researcher brings value to a larger project. iCORE researchers have many connections with colleagues around the world, and are actively involved in collaborative research projects. Details on these partnerships and industry projects can be found in the annual iCORE Research Report.

Partnerships with researchers	
National and international research collaborations	65
Multi-discipline or multi-institutional partnerships	19
Partnerships with industry	
Researcher industry projects	49

Awards

iCORE awardees are recognized by other adjudicated processes, reinforcing the excellence of the research supported by iCORE in Alberta. iCORE's Chairs and Professors have earned several prestigious awards.

Number of major awards by iCORE researchers	14
Canada Research Chairs	6
Steacie Fellowships	3
Royal Society of Canada appointments	2
IEEE Fellows	2
Fellow of the American Association of Artificial Intelligence	1

Intellectual Property Produced

The output of iCORE researchers is an indicator of the level of achievement in research. These measures reflect the breadth and quality of intellectual property produced, which yields both intellectual and economic returns.

Publications	376
Academic journals	164
Conference papers	196
Books or chapters	16
Patents	
Prior to iCORE award	5
Since iCORE award	5

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