



Description of NSERC and its programs

People. Discovery. Innovation.

Produced by the

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Introduction

NSERC, the Natural Sciences and Engineering Research Council of Canada, is the primary federal agency investing in university research and training in the natural sciences and engineering.

Vision

NSERC will help make Canada a country of discoverers and innovators for the benefit of all Canadians

Mission

NSERC will achieve this by investing in people, discovery and innovation through programs that support university research in the natural sciences and engineering on the basis of national competitions.

Role

As a national instrument for making strategic investments in Canada's capability in science and technology, NSERC:

- Invests in people by directly and indirectly supporting some 23,000 university students and postdoctoral fellows in their advanced studies.
- Promotes discovery by funding more than 11,000 university professors every year.
- Helps make innovation happen by encouraging more than 1,300 Canadian companies to invest in university research.

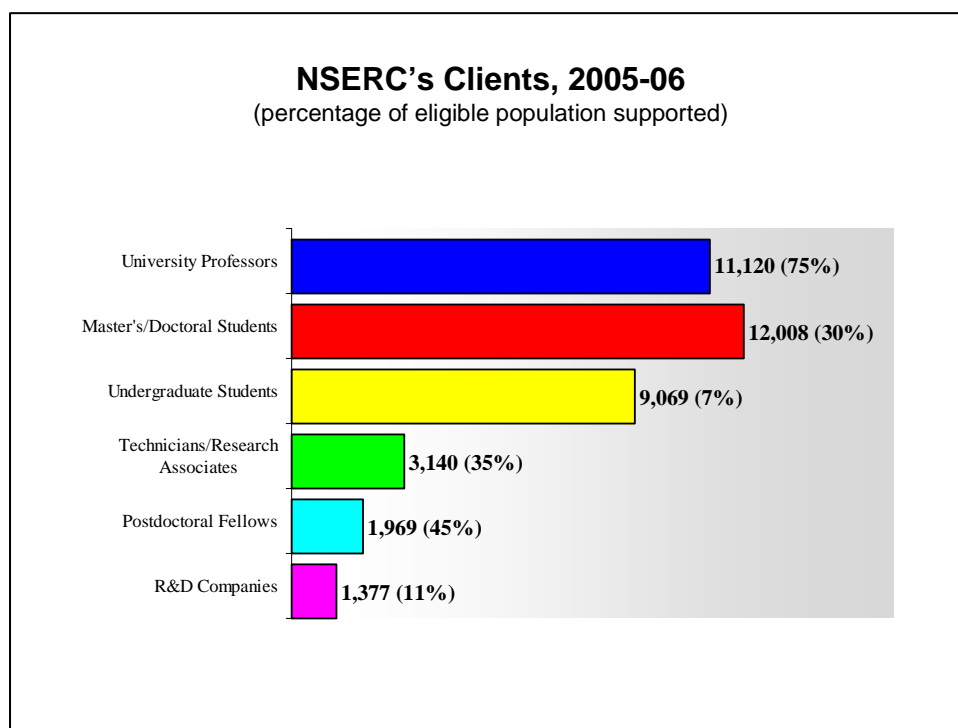
NSERC's programs and activities fall under three main themes: people, discovery and innovation. These provide three foundational elements of Canada's innovation system.

Over the last ten years, NSERC has invested \$6.1 billion in basic research, university-industry projects, and the training of Canada's next generation of scientists and engineers.

NSERC's clients and partners

Each year, NSERC supports the research careers of more than 11,000 university professors and some 23,000 university students and postdoctoral fellows, as well as thousands of university technicians and research associates.

The figure below presents the details of NSERC's client support. The figure in parentheses is the percentage of people and organizations in each category that benefit from NSERC funding either directly through obtaining a grants or scholarship or fellowship, or indirectly through receiving a stipend out of a grant awarded to a professor.



* NSERC contributes to the salary of graduate students or postdoctoral fellows trained in industry.

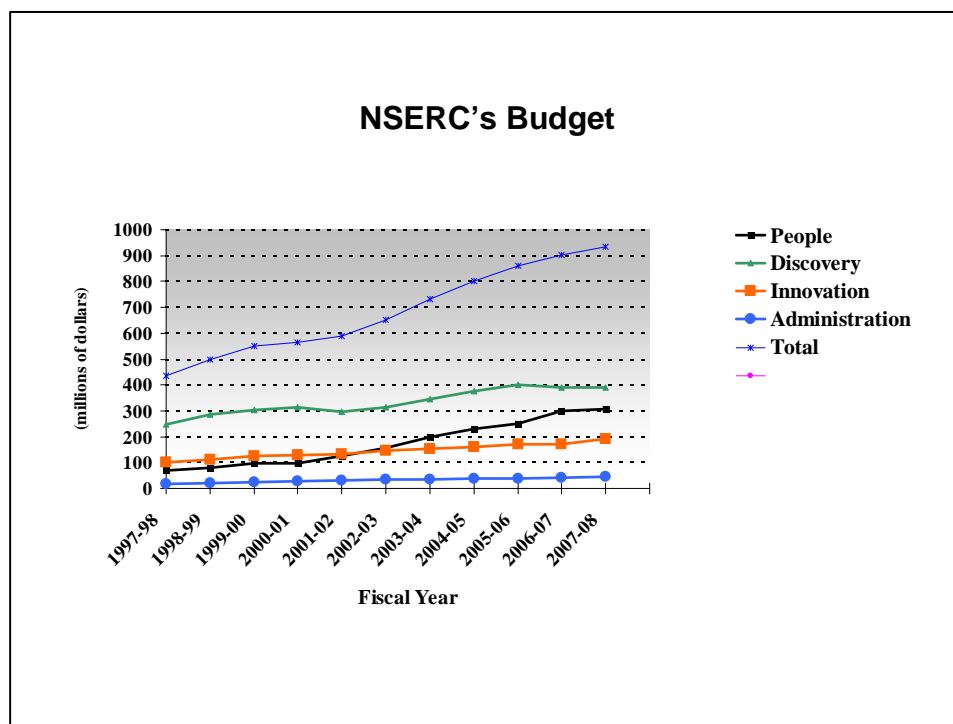
Over the past decade, an increasing number of companies have contributed to NSERC's research partnership programs and co-funded students and fellows. More than 1,500 firms currently participate in NSERC programs.

NSERC is well-known to companies heavily involved in R&D. In 2006, seventy-three of the top 100 Canadian R&D companies (as ranked by *RESEARCH MONEY*, 2006) have collaborated with NSERC to support university research and training.

In the broadest sense, all Canadians are NSERC's clients. The innovations and discoveries of NSERC-supported scientists and engineers have created thousands of new jobs over the years and they affect every corner of the economy.

NSERC'S Budget

In 2007-08, NSERC will invest more than \$935 million in university-based research and training in all the natural sciences and engineering. Since 1997-8 NSERC's funding has more than doubled. NSERC's budget is now higher than at any point in its history, but it is still insufficient to meet the growing needs of its research community.



Administration costs represent about 5 per cent of the overall budget.

The rapid growth in the “People” programs since 2000 results mainly from two programs created by the Government of Canada:

- The **Canada Research Chairs program**, at \$300 million per year to establish a total of 2000 research professorships (900 in the NSE) in universities across the country by 2008.
- The **Canada Graduate Scholarships (CGS)**, which initially contributed to supporting 2000 Masters’ students and 2000 doctoral students (600, at each level, are in the NSE). These are in addition to the NSERC’s own scholarships support programs. In the 2007 Budget, a further 1000 CGS have been added, with 400 of those to be distributed by NSERC.

NSERC’s budget represents 9.8 per cent of the federal government’s expenditure on science and technology, and 16 per cent of all university R&D funding in the natural sciences and engineering.

NSERC's Programs

NSERC's programs fall under their main themes: People, Discovery and Innovation. Highlights on our programs are provided below. More details are provided in Appendix 1.

People

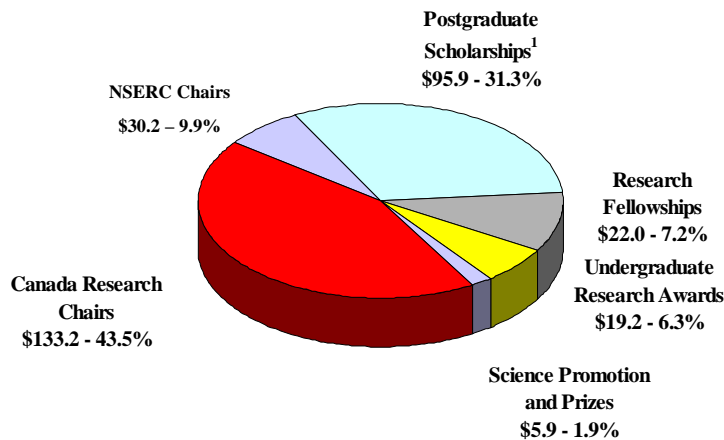
- Programs for scholarships and fellowships that support students as they prepare to become Canada's next generation of experts;
 - From Undergraduate Students to Graduate Students to Postdoctoral Fellows levels;
 - There are two streams at each level – training within a university environment and training within an industrial environment;
 - These programs stretch considerably the purchasing power of Discovery Grants by putting in university labs students and fellows who bring their own salary: 3,500 Undergraduate Students, over 2,000 graduate students and about 225 postdoctoral fellows (only counting awards held in Canadian universities only), for an investment of \$118 million).
- Programs of chairs to create and support faculty positions. These ensure the availability of experts in a wide variety of fields to train the next generations, perform research, and act as expert resources for other parts of the innovation system. These programs include:
 - Canada Research Chairs, a program administered for NSERC, the Social Sciences and Humanities Research Council (SSHRC) and Canadian Institutes for Health Research (CIHR) by a Secretariat (located within SSHRC)¹;
 - Industrial Research Chairs, funded in partnership with one or several companies who want to create critical mass of expertise in universities;
 - Northern Research Chairs, which have helped re-build a vibrant community of researchers interested in research in the Canadian North;
 - Chairs for Women in Science and Engineering (5 each located in one region of Canada). This program aims to increase the participation of women in science and engineering and to provide role models for women considering careers in these fields;
 - Chairs in Design Engineering and in Environmental Design Engineering, forming a network across Canada to improve the level and quality of design and environmental design engineering activity within Canadian universities.

¹ The CRC program will not be further covered in this report

- Programs that celebrate research achievements and research partnerships with industry, promote a science culture in the Canadian public and spur the interest of young people in science and math education.
 - NSERC has a suite of prestigious prizes that recognize research excellence at all levels (outstanding students and world-class faculty), individually or in teams;
 - In addition there are a number of highly coveted prizes that celebrate successful partnerships between university and industry;
 - Two specialty programs support organizations engaged in outreach to youth or research in science education. These program have impact that are out of proportion to their modest budgets.

The following figure presents a breakdown by program of the ‘People’ budget.

People Programs Budget 2007-08 (millions of dollars)



Total: \$307

1. Includes Canada Graduate Scholarships (\$37.5).

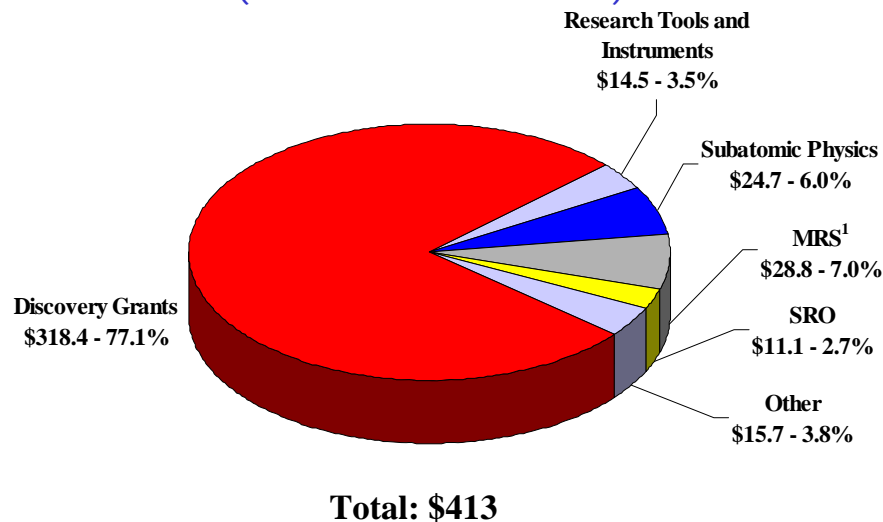
Discovery

- Programs that support the conduct of basic research and ensure Canada's on-going involvement in the generation of knowledge, new ideas and the capacity to build on the advances of knowledge made elsewhere;
 - The main program under this heading is NSERC’s Discovery Grants Program (which is described in detail in a separate document), which is NSERC’s largest program at \$328 million in 2007-08;

- Complementing it is the Special Research Opportunity Program that provide \$11 million per year in funding for research projects that often involve international collaboration;
- A pilot program (\$2 million per year) to increase research capacity in small universities.
- The Research Tools and Instrument Program that supports the acquisition of new research instruments and equipment;
- The Major Resource Support Program that helps ensure that major regional and national research facilities are maintained in a state of readiness and that their use is maximized. It complement the Discovery Grants by providing core operating funds to facilities, thus reducing the level of user fees to be paid by individual researchers.

The following figure presents a breakdown by program of the ‘Discovery’ budget.

Discovery Programs Budget 2007-08 (millions of dollars)



1. Includes Canadian Light Source funding from NRC (\$3M) and Budget 2004 (\$6M).

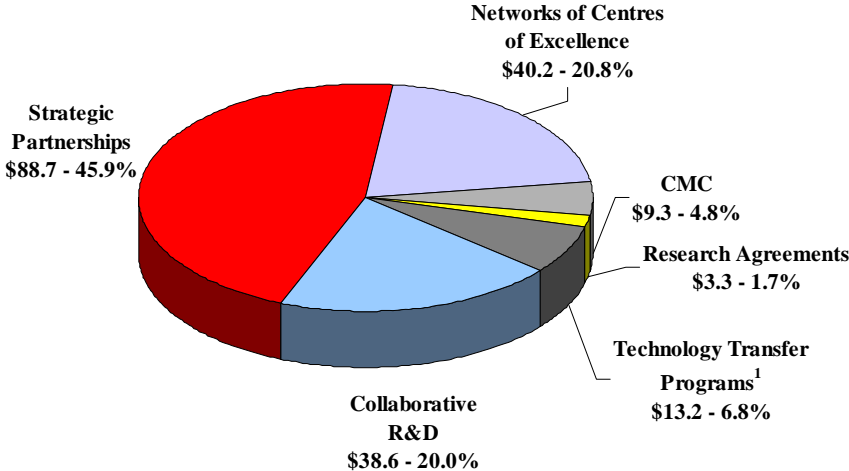
Innovation

- Programs that accelerate research in areas of strategic importance to Canada;
 - The Strategic Project Grants, the Strategic Network Grants and the Strategic Workshop Grants provide considerable funding (\$84 million) to projects in 7 target areas, of which 3 are identified by the Government of Canada as priority areas (environment, energy and Information & Communications Technologies)

- The Collaborative Health Research Projects Program, which is financed jointly by NSERC and CIHR, for projects that facilitate the transfer of new knowledge in the natural sciences and engineering into applications that will benefit the health of all Canadians;
- Programs that support the productive use of knowledge through partnership projects where university researchers help to solve problems or find answers to issues raised by companies. On average Canadian industry provides 50% of every dollar spent on these projects. Networking and the creation of partnerships between researchers in universities, industry and government are a standard feature of these programs;
 - The Collaborative R&D Grants program supports focused university-industry collaborative research projects that have the potential to result in industrial or economic benefits to Canada and offer training opportunities for students in areas relevant to industry
 - The Research Partnerships Agreements help build strong linkages between the private sector and researchers in universities and federal institutes and to create synergy among the partners;
- Programs that provide resources and experts to accelerate the process of transferring knowledge and technology to the user sector;
 - The Idea to Innovation Program is designed to accelerate the pre-competitive development of promising technology and promote its transfer to Canadian companies;
 - Intellectual Property Mobilization and the Networked Training Initiative is a tri-council program (NSERC, CIHR and SSHRC) that accelerates the transfer of knowledge and technology residing in Canadian universities and hospitals for the benefit of Canada by providing funding in support of a range of technology transfer activities and helping to build the expertise for Canada in technology transfer and commercialization.

The following figure presents a breakdown by program of the 'Innovation' budget.

Innovation Programs Budget 2007-08 (millions of dollars)



Total: \$193

1. Includes College and Community Innovation Program (\$0.3M).

People

The **Undergraduate Student Research Awards (USRA) program** is intended to stimulate students' interest in research in the natural sciences and engineering (NSE), and to encourage them to undertake graduate studies and pursue a research career in these fields. Students have the opportunity to work on a challenging research project in either a university or an industrial environment.

The program has two components: USRAs in universities provide research experience in an academic setting, while research experience in an industrial setting is gained through the Industrial USRAs.

The award has a value of \$4,500, plus a supplement of at least 25 per cent from the host university or company. The normal duration of the award is 16 consecutive weeks on a full-time basis.

There are currently 3,500 awards tenable in universities for a total annual budget of \$15,750,000 and 750 awards for a total annual budget of \$3,375,000.

The Canada Graduate Scholarships (CGS) and NSERC Postgraduate Scholarships (PGS) programs are presented together because they share an application and review process and have identical eligibility criteria and conditions of award.

Canada Graduate Scholarships (CGS) provide financial support to the most outstanding eligible scholars pursuing master's (M) or doctoral (D) studies in a Canadian university. The Government of Canada established these prestigious scholarships, to be awarded through national competitions by each of the three granting agencies, to ensure a reliable supply of highly qualified personnel to meet the needs of Canada's knowledge economy.

NSERC Postgraduate Scholarships (PGS) provide financial support to high-calibre scholars engaged in master's (M) or doctoral (D) programs in the natural sciences or engineering (NSE). This support allows these scholars to fully concentrate on their studies and to seek out the best research mentors in their chosen fields.

CGS M	\$17,500 (for one year)	Valid at master's or doctoral level
PGS M	\$17,300 (for one year)	Valid at master's or doctoral level
CGS D	\$35,000/year (for up to three years)	Valid at doctoral level only
PGS D	\$21,000/year (for up to three years)	Valid at doctoral level only

CGS: In 2007-08, NSERC's portion is \$37.5 million per year (ramping up to \$42.3 by 2009-10), which at maturity will allow approximately 800 CGS M and 800 CGS D holders to be supported. These awards are tenable in Canadian universities only.

PGS: Approximately \$50.9 million for fiscal year 2007-08, allowing NSERC to support 2,600 graduate students (1,200 the M level and 1,400 at the D level) are offered annually. Between 92-95% of these awards are held in Canadian universities.

Between the CGS and PGS programs, NSERC provides direct support to 12% of Masters' students and 23% of doctoral enrolled in Canadian universities.

The **Industrial Postgraduate Scholarships (IPS)** allows highly qualified master's and doctoral students in science and engineering to gain research experience in industry while undertaking advanced studies at a university in Canada. These scholarships are aimed at encouraging scholars to consider research careers in industry, where they will be able to contribute to strengthening Canadian innovation.

The award has a minimum value of \$21,000/year: NSERC contributes \$15,000/year while the host company contributes a minimum of \$6,000/year.

In 2007-08, the budget for IPS is \$6 million, allowing 400 awards.

The majority of applications and awards are in engineering, and earth sciences and ecology. In 2006-07, the Western Provinces received 34.7% of the awards, while Ontario and Quebec were awarded 58.2%, and the Maritime Provinces, where the industry base is limited, garnered the remaining 6.9%.

The **Postdoctoral Fellowships (PDF)** provide support to a core of the most promising researchers at a pivotal time in their careers. The fellowships are also intended to secure a supply of highly qualified Canadians with leading-edge scientific and research skills for Canadian industry, government and universities. NSERC encourages qualified Aboriginal students to apply to this program.

The PDF provides support for 2 years.

The 2006-07 budget for the program is \$17 million, which provided for approximately 255 two-year awards valued at \$40,000 per year. About half of the awards are held in Canada.

The **Industrial Research and Development Fellowships (IRDF)** program encourages recent Ph.D. graduates in science and engineering to gain experience and seek careers in Canadian industry; promotes awareness within Canadian industry of the capabilities of Canadian universities and university research; facilitate the transfer of expertise and technology; and provide an opportunity for Ph.D. holders seeking university careers to gain experience in industrial research and development (R&D).

IRDF are open to recent doctoral graduates seeking employment in Canadian industry for the first time.

NSERC contributes \$30,000 per year for two years, plus there is a minimum contribution from the host company of \$10,000 per year.

The annual budget for the IRDF program is \$5 million (85 awards) though expenditures have exceeded this amount in recent years as the number of quality applications increase.

The **Northern Research Internships** program supports senior undergraduate students, graduate students and postdoctoral fellows who are pursuing studies in the Canadian North,² by facilitating extended stays and subsidizing the costs associated with activities in the North.

Awards are made for a period of 12 to 16 weeks (within a 12-month period). NSERC will provide up to \$10,000 for a 16-week internship. This amount includes a stipend and an allowance for travel and logistics. Northern partners and the university must provide supplements of at least \$4,000.

The budget is \$180,000/year.

The **Industrial Research Chairs** are intended to:

- assist universities in building on existing strengths to achieve the critical mass required for a major research endeavour in science and engineering of interest to industry; and/or
- assist in the development of research efforts in fields that have not yet been developed in Canadian universities but for which there is an important industrial need; and
- provide an enhanced training environment for graduate students and, where appropriate, postdoctoral fellows, by exposing them to research challenges unique to industry and the opportunity for significant ongoing interactions with the industrial partner(s).

NSERC offers three types of Industrial Research Chairs:

- Senior Industrial Research Chairs for distinguished senior researchers (five year appointment, renewable);
- Associate Industrial Research Chairs for early-stage researchers demonstrating exceptional promise (five-year appointment, renewable once); and

² For the purpose of the Northern programs, Canada's North is defined as the land- and ocean-based territory that lies north of the southern limit of the discontinuous permafrost, from northern British Columbia to northern Labrador.

- Executive Industrial Research Chairs for outstanding R&D professionals (five year appointment, non-renewable)

Chairholders are expected to focus their activities on conducting research and training highly qualified personnel, while carrying a reduced administrative and teaching load. IRCs are funded jointly by NSERC and industry on a 50:50 matching formula.

The number of awards has more than doubled over the past 5 years. The average award is \$145K from NSERC, plus the industrial component.

The **Northern Research Chairs** program objectives cover four interdependent and overlapping areas:

1. Research: to contribute to the body of knowledge in fields of northern natural sciences and engineering.
2. Training: to train new northern researchers.
3. Partnerships: to build meaningful northern research partnerships.
4. Communications and promotion: to communicate northern research issues and promote Canadian university northern research and training.

The program supports a combination of up to 6 Chairs (combination of Senior and Junior). For the Senior Chair positions, NSERC's contribution is up to \$250,000 per year over the five-year term of the Chair. For the Junior Chair positions, NSERC's contribution is up to \$150,000 per year for five years. The awards cover a portion of the salary and a research grant to the Chairholder.

Total annual expenditures for the NRCP are \$1.2M.

The **Chairs for Women in Science and Engineering** program is regional, with one Chair for each of the Atlantic, Quebec, Ontario, Prairie and British Columbia regions. The goal of this Chair program is to increase the participation of women in science and engineering and to provide role models for women considering careers in these fields.

NSERC will match private-sector cash contributions of up to \$70,000 per year for each of five years towards the creation of individual chairs.

Chairholders are expected to contribute up to 50% of their time to the activities of the chair, and the remaining time to their professor/researcher activities at the university.

The **Chairs in Design Engineering (CDE)** and the **Chairs in Environmental Design Engineering (CEDE)** programs were established to improve the level and quality of (environmental) design engineering activity within Canadian universities. They are expected to establish innovative training programs; design and develop innovative products, processes and

technologies; establish effective multi-disciplinary design partnerships, teams and networks; and generate increased awareness of all aspects of design engineering.

NSERC will match cash contributions from sponsoring private and public organizations up to a maximum of \$200,000 per year, or \$1 million over the five-year term of the Chair. These partner contributions may come from industry, government, the university, or any other private or public sector organizations, communities or individuals.

The **PromoScience** program supports organizations involved in the promotion of science and engineering to Canadian youth. By supporting these ongoing promotion activities, NSERC expects to help increase the numbers of students who pursue studies and consider careers in science and engineering.

The PromoScience budget in 2006-07 is \$2.75 million. This figure includes both new awards and multi-year grant commitments made in previous competitions.

In the six-year history of this program, a total of 290 grants have been awarded. The ranges of the number of grants awarded (27-66 per year) and the annual success rates (34-58%) have varied due to the nature of the competition cycle. Funding rates for the PromoScience program have consistently been low – ranging from 10% to 30 %

The **Centres for Research in Youth, Science Teaching and Learning (CRYSTAL)** (Pilot Program) recognizes that science literacy and numeracy are vital skills in the 21st century economy. The CRYSTAL pilot program will provide a forum for the many partners who share an interest in developing and enhancing the skills of, and resources available to, science and mathematics teachers, and in enriching the preparation of Canadian children in these foundation subjects.

Centres will establish effective collaborations between researchers in education and those in science, mathematics and engineering, as well as the education and science promotion communities, and others (as appropriate) at the national, regional, provincial and/or local level. Together, the group will develop a cohesive, interdisciplinary research program to:

- increase our understanding of the skills and resources needed to improve the quality of science and mathematics education (K-12); and
- increase our understanding of the best ways to enrich the preparation of young Canadians in these foundation subjects.

In addition, Centres will evaluate and develop knowledge translation and outreach activities and support the successful training of university students as highly qualified researchers and/or professional educators in science and mathematics. Collectively, Centres will form a national network for the exchange of research results and best practices.

The Program budget is \$1,030,000 per year for five years. There are five grants receiving up to \$200,000 per year for five years. One centre was also awarded \$30,000 per year for the additional role of overall national networking and leadership. No additional competitions are planned for the immediate future.

Prizes

The E.W.R. Steacie Memorial Fellowships are awarded annually to enhance the career development of up to six outstanding and highly promising scientists and engineers who are faculty members of Canadian universities. The Fellowship allows the recipient to concentrate on research for two years. NSERC contributes a salary component paid to the university for administrative and teaching release. The Fellow may also request a supplement to their Discovery Grant and submit a Research Tools and Instrument application; the research supplement typically ranges between \$80,000 to 100,000 p.a. for 2 years.

The Gerhard Herzberg Canada Gold Medal for Science and Engineering is the Council's highest honour. It is awarded annually to an individual who has demonstrated sustained excellence and influence in research, for a body of work conducted in Canada that has substantially advanced the natural sciences or engineering fields. The award comes with a supplement that brings the winner's Discovery Grant to \$1,000,000 over 5 years (with a minimum of \$50,000 p.a. for 5 years).

The Brockhouse Canada Prize for Interdisciplinary Research in Science and Engineering celebrates some of Canada's most outstanding interdisciplinary teams of researchers in the natural sciences and engineering and their contributions to international science and technology. Also, it promotes interdisciplinary and collaborative research. The winning team receives a research grant of \$250,000.

The NSERC John C. Polanyi Award recognizes and supports a university researcher or team of researchers whose work has led to a recent outstanding Canadian advance in a field of the natural sciences or engineering. The winning researcher or team receives a research grant of \$250,000.

The NSERC Howard Alper Postdoctoral Prize recognizes the most outstanding postdoctoral fellow in natural sciences and engineering. One award is made annually. The winner receives \$20,000 and a plaque.

NSERC André Hamer Postgraduate Prizes recognize the most outstanding graduate students in the NSE. There are two \$10,000 annual prizes, tenable only in Canada – one prize at the master's (PGS/CGS M) level and one at the doctoral (PGS/CGS D) level.

Julie Payette-NSERC Research Scholarships: Canadian astronaut and former NSERC Council member Julie Payette agreed to lend her name to this program, which embodies the leadership qualities and excellence that NSERC is seeking to encourage and support. These highly prestigious awards are valued at \$25,000 and are offered for a one-year period to the best Masters' level applicants in the competition. There are 24 awards.

The NSERC Doctoral Prizes recognize excellence in student research in the natural sciences and engineering. Over the years, these prestigious awards have honoured the achievements of Canada's most promising scientists and engineers. The recognition comes with a cash prize of \$10,000 (check amount).

The Synergy Awards for Innovation recognize examples of university-industry collaboration that stand as a model of effective partnership. Winning universities receive a \$25,000 NSERC research grant. Industry partners receive the prestigious Synergy sculpture.

The Innovation Challenge Award was launched in 2004 by NSERC and the Canadian Science and Technology Growth Fund (CSTGF). Graduate students are encouraged to take a new look at their thesis work and identify, by written essay, what potential product or service could be implemented through application of their research results. There are three awards: one \$10,000 main prize and two \$5,000 runner-up prizes. Honourable mention prizes (\$1,000) may also be awarded if applications are deemed meritorious.

The Michael Smith Awards for Science Promotion honour individuals and groups who make an outstanding contribution to the promotion of science in Canada, through activities encouraging popular interest or developing science abilities. Two awards are made each year. Individual winners receive \$5,000 and organizations \$10,000.

Discovery

The Discovery Grants Program is covered extensively in a separate document.

The **Northern Research Supplements** program was established to help augment and promote Canadian university-based northern research and training. The Northern Research Supplements program recognizes the added logistical costs unique to conducting research in the Canadian North.

Successful applicants will receive a supplement to their NSERC Discovery Grant of up to \$10,000 per year, for the duration of their Discovery Grant, to supplement logistical costs associated with research in the Canadian North.

The program has a budget of \$650,000 normally. In 2007-08 and 2008-09 this amount will be supplemented by a further \$1 million, in recognition of the increased level of activity during the International Polar Year.

The **Ship Time** Program allows researchers to apply for additional funds to access vessels in support of their research programs.

This program is aimed at Discovery Grant holders NSERC-funded researchers who intend to use a vessel for their Discovery Grant-supported research in the coming years. It recognizes the high costs associated with chartering research vessels in Canada and abroad.

The program budget has historically been approximately \$1 million. The number of applications varies from year to year, but typically 15-20 are received for support each year. In 2006-07, 12 awards were made.

The **Special Research Opportunity (SRO)** program supports unique, emerging research opportunities that are timely, urgent, high-risk or have a strong potential for breakthrough that will be of substantial benefit to Canada. The program also supports pre-research activities to investigate and develop potential new collaborative projects necessary to respond to these national and international opportunities.

The program supports well-defined pre-research activities or research projects for up to a maximum of three years. Continuation of research activities flowing from the SRO project is expected to be carried out through other NSERC programs.

In addition, there are targeted initiatives under the SRO program. Over the past 18 months, the SRO has included the Inter-American Collaboration in Materials Research (CIAM) and International Polar Year (IPY) programs; these projects supported under these calls for proposals represent about 25% of the total program.

The program has a budget of approximately \$11 million in 2007-08. There are currently 45 active grants.

The goals of the **Research Capacity Development (RCD)** pilot program are to help small universities eliminate some of the barriers to increased research productivity and to help them build the foundations for further success in this area. RCD grants are institutional awards that provide up to \$300,000 per year for up to five years.

One competition was held in 2004. The 5-year pilot program was open to Canadian universities eligible to administer NSERC funds, and which received \$3 million or less in NSERC scholarships and grants during the 2002-2003 fiscal year. Proposals were assessed based on:

- The potential for building and sustaining the university's research productivity and the local capacity for research-based innovation;
- The extent of the incremental benefit that this grant will have on the current natural sciences and engineering research activities at the institution;
- An appropriate strategy for building research capacity and the university's commitment to achieving it;
- The coherence of the proposed activities with the university's vision for research capacity development;
- A complete work plan, including an appropriate budget to address the barriers to research productivity;

- The nature and extent of the collaboration that would result from the funding;
- The impact on the training of highly qualified personnel; and
- The potential benefit to the local and national economy and quality of life.

Successful institutions are required to track several performance indicators and report on these annually. A formal evaluation will be undertaken in 2008 to determine whether this program should be continued as a pilot, made permanent or be terminated.

The budget for the RCD (pilot) program is \$2.15 million per year for five years. The maximum funding over five years is \$1.5 million per institution.

Seven institutions are receiving an RCD grant: Brock University, Saint Mary's University, University of Lethbridge, St. Francis Xavier University, Lakehead University, Laurentian University and Université du Québec à Rimouski.

The **Research Tools and Instruments (RTI) Grants** program supports the purchase of research equipment and installations and in so doing fosters and enhances the discovery, innovation and training capability of university researchers in the natural sciences and engineering.

Although there are in principle three categories of RTI grants based on the size of the equipment requested, only the Category 1 is currently offered. The maximum amount for this category is \$150,000.

In recent years, the program budget has seen substantial fluctuations from year to year, depending on availability of funds. In recent years the minimum competition budget has been \$17 million (in 2002) and the maximum \$49 million (in 2007)

NSERC typically receives between 1,200 and 1,600 RTI-1 applications per year. In 2007, a total of 1,532 applications were received and 769 awards were made, for a success rate of 49.9 % and an overall funding rate of 45.5%.

The **Major Resources Support (MRS) Program** assists in covering the operating and maintenance costs of research resources that are significant in size, value or importance, that are of regional, national or international reach, and that are not customary in a discipline or commonly available in Canadian universities, thus ensuring that they remain in a state of readiness for academic researchers to use. The grants do not cover the costs for carrying out actual research activities nor can they be used to pay for indirect costs of research or expenses that are central or departmental institutional costs (The federal Indirect Costs program assists universities and colleges in paying for such costs.)

For 2007, the budget for the MRS program is \$17.9 million.

There is an acute demand for sustained support to the operating and maintenance costs of major research resources. This need is related to the large investments made by the federal government

through the Canada Foundation for Innovation, over the last several years in support of science and technology.

Despite a significant increase to the MRS budget over the years (from \$8.1 million in 2001 to \$17.9 million in 2007), the funding rate (ratio of \$ awarded relative to the \$ requested) has gone from 40% to the 25% anticipated in the 2008 competition. Researchers must bear the funding deficit out of their research funding (Discovery and project grants) through user fees.

Innovation

Strategic Grants Programs

The Strategic Grants Programs are an umbrella comprising 3 components:

- Strategic Projects Grants (SPG)
- Strategic Networks Grants (SNG)
- Strategic Workshops Grants (SWG)

Together these programs will:

- generate new knowledge/technology with the strong potential to strengthen Canada's industrial base, generate wealth, create employment, and/or influence Canadian public policy;
- increase the number of highly qualified personnel in the areas targeted by this program;
- foster the increased participation of Canadian-based companies and/or government organizations in academic research; and
- enable the transfer of knowledge/technology and expertise to Canadian-based companies that are well positioned to apply the results for economic gain or to government organizations to strengthen public policy.

The difference between the Projects and Networks elements is one of scale and complexity of the initiative, with the Network program funding large-scale, complex research proposals that involve multi-sectoral collaborations. Strategic Networks may be local, regional or national. Strategic Networks require a minimum of \$500,000 and a maximum of \$1.2 million annually from NSERC and are funded for up to five years. The grant can include an amount of up to \$200,000 per year for international networking and collaboration. These grants are not renewable for a second term.

The Strategic Workshops Program is intended to fund workshops for building new collaborations between Canadian academic researchers and the industry and government receptor community. Workshops are intended for small, highly focused groups, with attendance not expected to exceed 20 participants.

The 7 target areas are:

- Advanced Communications and Management of Information
- Biomedical Technologies
- Competitive Manufacturing and Value-Added Products and Processes
- Healthy Environment and Ecosystems
- Quality Foods and Novel Bioproducts
- Safety and Security
- Sustainable Energy Systems (Production, Distribution and Utilization)

In 2007-08, the budget is \$84 million and will be \$95 million next year. This includes new funds from the Government towards identified priority areas (environment, energy and Information and Computing Technologies).

Strategic Projects grants average \$130,000 p.a. for 3 years.

There are 12 active Strategic Networks grants – these awards vary between \$500,000 and \$1,200,000 per year, generally for 5 years.

The Workshop component has only been recently launched. Two awards have been made (between \$20,000 and 25,000).

The **Collaborative Health Research Projects (CHRP)** supports interdisciplinary research that benefits from the convergence of knowledge in natural sciences and engineering with that in the health sciences. In addition to increasing collaborations and interdisciplinary training opportunities, the program facilitates the transfer of new knowledge in the natural sciences and engineering into applications that will benefit the health of all Canadians. The program is funded jointly by NSERC and the Canadian Institutes of Health Research (CIHR); this gives better visibility of the funding opportunities for interdisciplinary research in both the NSERC and CIHR communities.

In 2007-08, the CHRP Program has a total budget of \$6M (NSERC+CIHR contribution); the budget will grow to \$13.8M over the next 3 years.

In 2006 competition, NSERC received over 200 Letters of Intent. Fifty four were retained and invited to the full application stage; these applications requested \$7.4 million in year one. Of these, the 18 applications were selected for funding, representing a success rate of 33% and an average annual award of \$121,160 per year, generally for 3 years.

The **Collaborative Research and Development (CRD)** Grants Program is a knowledge and risk-sharing program with benefits to both Canadian universities and industry. The program supports focused university-industry collaborative research projects that have the potential to result in industrial or economic benefits to Canada and offer training opportunities for students in areas relevant to industry. This is a industry-driven program, with industry committing to support at least half the cost of the research and to exploit the results.

The demand for this program has been increasing over the past 5 years, at a rate of about 10% year over year. There are now more than 600 active projects supported for a total amount \$37.6M (NSERC portion only).

The **Research Partnership Agreements (RPA)** Program was established to help build strong linkages between the private sector and researchers in universities and federal institutes and to create synergy among the partners. The program is administered by NSERC through partnership agreements signed with Canadian federal government departments and agencies.

- The current partnerships are:
 - Department of National Defence/NSERC Research Partnership Program
 - Agriculture and Agri-Food Canada/NSERC Research Partnership Support Program
 - Canadian Forestry Service/NSERC/SSHRC Forest Research Partnerships Program (ending in March 2007, no new applications accepted after November 1, 2006)

The Idea to Innovation (I2I) Program is a new program designed to accelerate the pre-competitive development of promising technology and promote its transfer to Canadian companies. The program supports research and development projects with recognized technology transfer potential by providing crucial assistance to university researchers in the early stages of technology validation and market connection.

The **Intellectual Property Mobilization (IPM)** Program is a tri-council program (NSERC, CIHR and SSHRC) that accelerates the transfer of knowledge and technology residing in Canadian universities and hospitals for the benefit of Canada by providing funding in support of a range of technology transfer activities and helping to build the expertise for Canada in technology transfer and commercialization. IPM grants are intended to strengthen the ability of these institutions to manage their intellectual property, to attract potential users and to promote the professional development of intellectual property personnel through a network approach. The ultimate goal is to contribute to strengthening Canada's competitiveness in a knowledge-based global economy.

The **Networks of Centres of Excellence (NCE)** Program, managed jointly by NSERC, SSHRC, CIHR, and Industry Canada, supports focused national research networks involving managed and coordinated interdisciplinary projects and themes. These networks are designed to accelerate the exchange of knowledge and technology among university, government and industry researchers across the country, with the goals of facilitating the transfer of knowledge to those who can use it to advance our social and economic development, accelerating innovation and boosting Canada's performance in science and technology.

Each network builds partnerships between academia, industry and government to put new knowledge, research and technology to work to create a better Canada. Highly qualified personnel – from graduate students and postdoctoral fellows to world leaders in their particular fields – work co-operatively through NCE-sponsored initiatives in the natural, social and health

sciences. Their work involves everything from leading-edge investigations into the causes of and potential cures for cancer to the use of robots and intelligent systems to perform tasks in difficult environments.

NCE metrics are impressive. In 2005-06:

- 25 NCEs were supported, involving 1,624 researchers in 65 Canadian universities, 926 companies, 350 provincial and federal government departments and agencies, 64 hospitals, 202 universities and 628 organizations from Canada and around the world.
- The NCE program leveraged partnership investments of almost \$70 million, including \$27.4 million from private sector companies. When the NCE program's own funding is included, almost \$150 million was available for research, training, knowledge translation and commercialization.