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Natural Sciences and Engineering Research Council of Canada

NSERC Contact

Investing in people, discovery and innovation

The Expert Panel's Final Report

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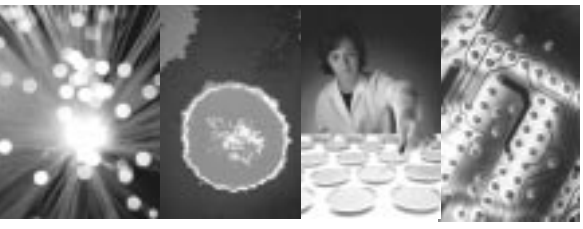

The final report of the Expert Panel on the Commercialization of University Research was made public on the last day of May. Under the title "Public Investments in University Research: Reaping the Benefits," the report deals mainly with research-based innovation. As a result of a consultation across Canada, the final report differs in important ways from the earlier draft. It is available on the Web (at http://acst-ccst.gc.ca), and by now it will also have been distributed in hard copy. This is an important document that may become the basis of government policy, and I urge university researchers to read it in full.

In this commentary, I shall highlight what I consider some of the most important ideas in "Reaping the Benefits." But this is not a summary. Even though the report represents a consensus, I am well aware that other members of the Expert Panel might have chosen other ideas for emphasis.

The report deals only with research that is supported in any part by federal funds. Its focus is the return on the public investment in that research. The Panel is well aware that there are enormous and varied returns to society for investments in research, but the focus is narrower still. The object of the proposed policies is to provide the greatest possible economic return to Canadian taxpayers on the investments they make in university research through the federal government, ***whenever the results of such research are used for commercial gain***. This return takes the form of new economic activity in which Canadians use research results to produce new high value-added goods and services. It creates good jobs and provides tax revenues. This object takes primacy over creating new revenues for the universities where the research is done.

The report deals much more with innovation based on basic research than on the innovation that arises from project research carried out in university-industry partnerships. In the latter case, the channels for commercialization already exist through the industrial

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partners. It is basic research that is the source of many radical innovations and of start-up companies set up to exploit entirely new technologies.

Now for some details. “Innovation” is given the economic definition: the process of bringing new goods and services to market, or the result of that process. The definition of Intellectual Property (IP) explicitly excludes research monographs or papers. With that in mind, let me assert that everything that is in the report hinges on the choice made by the researchers who make a discovery, create an invention, or develop a new idea in their research. If the researchers choose to publish their results, or make them public in some other way, then nothing in the report applies to them. If, on the other hand, they decide to protect their invention for potential commercial development, then the invention must be disclosed to the university and the proposed policies come into force.

The final report does not dictate whether the university or the researchers own the IP—that is determined by the university’s own policy. If the researchers own it, they must assign it to the university for commercialization, but under certain specified conditions the university may assign it back to the owners.

The Panel was well aware that the limited faculty time for research in Canadian universities limits their potential to make an impact on the Canadian economy that is comparable with that of US universities, the only significant benchmark in this activity. This potential can be raised only by raising basic university funding in Canada and by providing the universities with the indirect costs of the research that they are expected to carry out. That, indeed, is the subject of the last recommendation in the report; the first five deal with realizing more of the potential that already exists.

The universities must have a commercialization office to provide the best possible service to the researchers who engage in research-based innovation. New targeted money would be provided to the universities at the level of 5% of their total federal research funding to help them provide that service and to invest in the improvement and protection of any IP that might result. This money would have to be spent over and above what universities already spend on the commercialization offices. Universities could choose to provide that service themselves or buy it. Small universities would be expected to pool their resources. The main point is to provide the best possible service to the researchers.

To be eligible for the 5%, the university must develop its own innovation policy that follows a dozen principles that include encouraging research-based innovation by providing incentives to their researchers. These incentives would be in the form of sharing any net financial benefits with them, and recognizing in tenure and promotion policies the investment of time and effort in the innovation process. Indeed, the Panel heard that there was such a strong cultural bias against innovation in some university departments that potential innovators were afraid of putting their academic careers in jeopardy. It was for that reason that the Panel recommended that innovation (as defined above) should be identified as the fourth mission of the university, or at least explicitly included in the traditional three missions of teaching, research and service, wherever it fits. The ear

for success in research-based innovation. There is a need in this area for people who understand the science and know the market. They must also know the legal steps involved in creating a start-up firm or licensing a technology, and work well with the financial community who would be involved in the different kinds of investment that need to be made along the way from an invention to a product in the market. And, of course, they have to be able to manage the transactions along the way effectively and in a timely way. Such people are rare, and the universities themselves need to take a hand in educating them.

A final recommendation deals with creating the business climate in which start-ups can prosper and grow. It involves taxation measures, including top personal tax rates, capital gains, and the treatment of employee stock options. The discussion of these matters in the report would not surprise anyone who has been reading Canadian newspapers in the last few months.

Under the rules governing expert panels, the report is now final. A consultation on that final version is now being planned for the fall, and a government decision on any action arising out of it is expected only after that.

NSERC Prize Winners Fêted at May 5th Gala

The atmosphere was celebratory, the company was stimulating and everybody was in high spirits during the 1999 Tribute to Research Excellence to honour University of Toronto mathematician Dr. James Arthur, recipient of the Canada Gold Medal for Science and Engineering, and the winners of NSERC's E.W.R. Steacie Memorial Fellowships and Doctoral Prizes at the Château Laurier Hotel in Ottawa.

Shown at the ceremony are (left to right): Drs. Tom Brzustowski, James Arthur and Ronald Duhamel.

Momentum built as many of the guests, who included Dr. Ronald Duhamel, Secretary of State (Science, Research and Development), Members of Parliament, previous award winners and distinguished researchers from across Canada, were introduced or gave tributes of their own. The Steacie and Doctoral winners spoke about what the awards meant to their research work.

The celebration concluded with the presentation of the Gold Medal to Dr. Arthur in recognition of his outstanding and sustained contributions to Canadian research in the field of mathematics. In his acceptance speech, Dr. Arthur focused not on his own work, but on some of the broader issues of interest to all researchers, such as those surrounding the nature of curiosity-driven research.

Dr. Arthur's research on automorphic forms and representation theory—particularly his "trace formula"—is widely considered to have opened new approaches to the challenges posed by the "Langlands program," a theoretical model developed by Canadian-born Robert Langlands. (A fuller description of Dr. Arthur's work appears on www.nserc.ca/news/arthur_e.htm.)

Collaborative Research Opportunities Program Gets Under Way

Over the next three years, Council will allocate up to $6 million (an initial $2 million in 1999-2000) to a new program to facilitate the participation of Canadian researchers in major national and international research projects.

Modeled on the former Collaborative Special Project Grants program, the Collaborative Research Opportunities (CRO) program will fund projects that present a special opportunity for collaboration. However, the budget will support only a small number of projects, and priority will be given to those that will enable Canadian researchers to make significant contributions to major international efforts or that present important multidisciplinary challenges.

To be considered this year, Letters of Intent must be submitted no later than September 1, and applications no later than October 15.

For details on the program, application procedures and deadlines, visit NSERC's Web site, www.nserc.ca/programs/resguide/cro_e.htm.

Welcome Back, Julie!

(And guess what she took with her...)

The NSERC emblem, that's what! When Julie Payette asked us if she could add it to the many items already in her flight bag, we responded with enthusiasm. After all, it seemed especially appropriate that this symbol, so familiar to Canada's research community, be represented on what has been described as the largest-ever scientific and technological project humankind has ever undertaken, and that brought together 16 countries.

But Julie had another reason for adding our symbol to her paraphernalia: her long-standing relationship with NSERC. As she explained in her pre-flight e-mail to us: "My association with the Council dates back to my graduate school years at the University of Toronto, when I benefited from an NSERC scholarship to pursue advanced studies in computer engineering. It allowed me to concentrate on research without financial worries. In 1995, I was honoured to be invited to serve as a member of the Council, representing, in particular, the interests of the younger generation of researchers. So I am very pleased to fly the emblem of the Natural Sciences and Engineering Research Council with me on board Space Shuttle Discovery during my mission!"

We were with you all the way, Julie, and proud of the NSERC connection. Welcome home!

Coming This Fall: The Synergy '99 Awards Presentation

Mark October 21-22 on your calendar, and attend the Synergy '99 Awards presentation and the 1999 Innovation Conference: Platforms for Organizational Growth, at the Westin Calgary Hotel in Calgary, Alberta. You'll find out how individuals, universities, companies and consortia are combining their expertise to reach new levels of commercial and academic success. Sponsored jointly by NSERC and The Conference Board of Canada, Synergy '99 is a national competition showcasing the best in collaborative research and development in the natural sciences and engineering. The Alberta Science and Technology Leadership (ASTech) Awards Gala takes place on October 22 as well.

If you're interested in attending the Synergy Awards presentation or the Innovation Conference, call the Conference Board at 1-800-267-0666 to register, or visit its Web site, www.conferenceboard.ca.

New Advisory Group Meets

An Advisory Group (see www.nserc.ca/programs/ethics/english/policy.htm for the membership) established to provide advice to the presidents of the three granting councils on the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans, and on its implementation as a living and evolving document, held its first meeting May 4 and 5.

The Advisory Group has the authority to make minor changes to the Policy that do not affect its goals, rationale and/or guiding principles. It is to assess proposals received from the research community to revise the Policy and/or to review specific sections of it, and recommend priority areas for policy development.

At its meeting, the Advisory Group identified the following areas for future revisions: naturalistic observation, research involving women, research involving aboriginal peoples, clinical trials, and clarification of concepts of minimal risk and proportionate review, and of included and excluded research. Priorities will be established for work to proceed over the next few years. Other areas may also be identified in the future. The target date for publishing a revised document is the end of summer 2002.

A more immediate task for the Advisory Group was to interpret the Policy Statement to answer questions on membership of Research Ethics Boards (REBs), authority of REBs, mandate of departmental REBs, appeal boards, exemptions to REB review, and third-party interviews, among others. These answers will be posted on the Tri-Council Web site (see address above).

Watch Out for SPARKs!

We ignited our SPARK pilot in February, to a very warm reception! If you're a researcher with an interesting story to tell, a SPARK may be just what you need.

SPARK is an acronym for Students Promoting Awareness of Research Knowledge—a new NSERC pilot program designed to turn the University of Guelph's very successful SPARK program into a national prototype. Through SPARK, students with an aptitude for communications will be recruited, trained and paid to write stories based on the NSERC-supported research at participating universities.

According to Tim Nau, NSERC's Director of Communications, "We see the initiative as a win-win-win investment. Students will be able to sharpen their communication and writing skills, and learn more about research; university researchers will have opportunities to promote their work; and the research that NSERC supports will be communicated widely to Canadians."

Universities responded enthusiastically to our invitation to participate in the pilot, and 10 were selected: Calgary, Carleton, Dalhousie, Laval, Manitoba, Memorial, Montréal, Regina, Saskatchewan and Victoria. NSERC is providing them with a total of approximately $70,000 over three years, and they are to obtain $50,000 from other sponsors.

Each SPARK program will be managed by an in-house communications specialist who will act as a mentor to the student writer(s). The mentor's role is to assign articles and provide students with practical training in interviewing, writing and editing skills as well as media communications and publishing. Students will work on a freelance or part-time basis, and receive payment for their work.

"SPARK can deepen students' understanding and appreciation of research, and make a difference in their lives," says Owen Roberts, Assistant (Communications) to the Vice-President, Research, and founder of the SPARK program in the University of Guelph's Office of Research.

Attending the April 24 workshop (front, left to right): SPARK writers Natasha Marko and Marianne Clark, and Margaret Boyd, Research Communications Officer, Guelph; (back, left to right) Sandy Cameron, Regina; Kathryn Warden, Saskatchewan; Roberta Koscielny, Manitoba; Dennis Urquhart, Calgary; Tambrae Knapp, Carleton; Ivan Muzychka, Memorial; Owen Roberts, Guelph; Catherine Young, Dalhousie; and Jean Hamann, Laval. Missing were Réal Lallier, Montréal, and Robie Liscomb, Victoria.

This was certainly true for Amina Ali, B.Sc. (Agriculture), a former SPARK Senior Writer at Guelph and now a master's student (Journalism) at the University of Western Ontario: "SPARK offers so much more than a typical part-time job. I've sharpened my journalism and communications skills, and also gained an invaluable glimpse into the research side of the university. Seeing researchers in action and communicating their work helped fuel my own interest and commitment to learning. The responsibility of coordinating research publications offers tremendous career development and leadership opportunities."

At a workshop held at the University of Guelph in April, the new SPARK mentors were given tips on setting up their program, training and mentoring students, getting media pickup and seeking external funding. Getting sponsors involved is crucial since NSERC will provide funds for the first three years only. After that, the program is expected to be self-sustaining.

Since 1988, the Guelph SPARK program has trained more than 40 students who collectively have written hundreds of research-related news stories that have been published in a variety of media and industry publications. The program is strongly supported by a wide range of industry and government sponsors.

The stories NSERC receives quarterly from the mentors will be used on our Web site and in some of our print publications. We'll also be sending a compilation to decision-makers to show how NSERC and SPARK are making a difference right across Canada.

MFA Competitions Now Annual

With the infusion of an additional $4 million from the recent federal budget increase, the Major Facilities Access (MFA) program will now offer annual competitions starting this fall. All researchers intending to apply for an MFA grant must submit a Notification of Intent to Apply for a Major Facilities Access Grant (Form 181) to NSERC by August 16, 1999. Information on the application procedure is available through your Research Grants Office or on our Web site, at www.nserc.ca/programs/resguide/mfa.htm.

University Visits Scheduled for 1999

NSERC's Research Grants and Scholarships and Fellowships Divisions are gearing up for their annual fall visits to selected universities.

You can obtain information about the visits from your university in August and September, or from the NSERC Site Visit Co-ordinator, by phone: (613) 996-2985 or e-mail: coord@NSERC.ca.

Research Grants

A team of Grant Selection Committee (GSC) members and NSERC Research Grants staff will be visiting a number of universities, including those NSERC was unable to visit last year due to the Air Canada strike. The schedule is posted on our Web site at www.nserc.ca/resear_e.htm.

The visits are intended to enhance communications between researchers, Grant Selection Committees and NSERC, and to familiarize applicants with the peer review process and the functioning of the GSCs. Mornings will be devoted to information sessions, a workshop on how to prepare an NSERC application, and a question-and-answer period; in the afternoon, GSC members will visit some departments and meet with department heads, faculty members and students, and may also tour some facilities.

TIPS…

For tips on how to prepare a winning scholarship or fellowship proposal, visit our Web site at www.nserc.ca/schol_e.htm.

Scholarships and Fellowships

Staff members will be visiting Toronto and Montreal on September 22, and Vancouver and Halifax on September 27 to promote NSERC Scholarships and Fellowships programs and brief university personnel who administer them on recent developments.

Division staff will also be making visits to universities holding orientation sessions for students planning to apply for NSERC scholarships and fellowships. If you are planning to hold such sessions on or around the dates of our regional site visits and would like NSERC staff to attend, please contact the Site Visit Co-ordinator as indicated above.

Results of the First University Faculty Awards Competition

As a result of NSERC's first University Faculty Awards competition, 22 women have been offered the opportunity to take up faculty positions in universities across Canada. Award holders will receive $40,000 in annual salary support for up to five years and a substantial research grant.

The program was created following last year's budget increase. Competition for the awards was intense, and while 15 awards were offered in March 99, 7 very talented and qualified women researchers had to be placed on a reserve list. As a result of the new funding provided NSERC in the 1999 federal budget, however, NSERC was recently able to offer them University Faculty Awards.

The deadline date for the receipt of nominations for the next competition is November 1, 1999.

For information on the program, visit NSERC's Web site at www.nserc.ca/programs/schol4_e.htm.

1999 S&F Competition Results

Following their review of approximately 3,000 applications the week of February 15, NSERC's six scholarship and fellowship selection committees offered 228 Postdoctoral Fellowships (PDF) and 1,664 Postgraduate Scholarships (PGS); the latter includes an additional 101 awards made possible by the increases NSERC received during the last two federal budgets.

The table below shows the 1999 competition results (including reversion list awards). The PGS and PDF awards are distributed among the selection committees according to a formula that takes into account the number of applications and the history of awards for each committee.

Postgraduate Scholarships and Postdoctoral Fellowships 1999 Applications and Awards

Selection Committee	Award Type	Number of Applications	Number of Awards	Success Rate (%)
Engineering	PGS	441	336	76.2
	PDF	82	28	34.1
Computer and Mathematical Sciences	PGS	415	314	75.7
	PDF	78	27	34.6
Physics and Chemistry	PGS	321	240	74.8
	PDF	152	52	34.2
Earth Sciences and Ecology	PGS	376	260	69.1
	PDF	149	44	29.5
Cellular and Molecular Biology	PGS	366	241	65.8
	PDF	153	46	30.1
Life Sciences and Psychology	PGS	399	273	68.4
	PDF	90	31	34.4
TOTAL	**PGS**	**2,318**	**1,664**	**71.8**
	PDF	**704**	**228**	**32.4**

1999 Competition Results—Research Grants Programs

NSERC's Grant Selection Committees reviewed 4,268 applications for Research and Equipment Grants in February 1999, and recommended 71.2% of the applications for Research Grants be supported and 46.8% of the applications for Equipment Grants (including Major Equipment, Major Installation and Major Facilities Access Grants).

The accompanying table summarizes current commitments resulting from the 1999 competition and instalments of grants awarded in previous competitions, but does not include a small number of awards for which a decision is still pending. The 5% increase resulting from Council's decision on the use of additional funds received in the 1999 federal budget is reflected in the table.

A detailed list of awards and statistics are available on NSERC's Web site at www.nserc.ca/about/stats/english/tablese.htm.

TIPS…

For tips on how to write a winning research grant proposal, visit our Web site at www.nserc.ca/resear_e.htm.

1999 Grants Awarded, Including Instalments (in $000)

Grants Selection Committee	Research Grants[1]		Equipment[2]	
	No.	$	No.	$
Animal Biology	216	6,618	14	694
Animal Physiology	199	7,534	38	1,032
Cell Biology	276	10,262	28	904
Molecular & Developmental Genetics	192	7,947	26	854
Plant Biology & Food Science[3]	291	11,202	53	1,429
Evolution & Ecology	431	14,060	43	1,352
Psychology	361	10,394	28	616
Inorganic & Organic Chemistry	270	14,246	57	5,428
Analytical & Physical Chemistry	290	13,067	38	2,736
General Physics	124	4,142	13	681
Condensed Matter Physics	204	7,204	29	1,657
Space & Astronomy	160	5,880	9	399
Solid Earth Sciences	280	9,819	17	810
Environmental Earth Sciences	329	8,943	32	1,483
Pure & Applied Mathematics - A	292	4,907	5	79
Pure & Applied Mathematics - B	215	3,489	12	318
Statistical Sciences	241	4,034	12	360
Chemical & Metallurgical Engineering	466	14,671	55	3,774
Civil Engineering	484	12,699	45	1,951
Communications, Computers, & Components Engineering	323	8,158	16	1,080
Electromagnetics & Electrical Systems Engineering	275	7,657	23	842
Mechanical Engineering	507	13,114	52	1,767
Industrial Engineering	225	5,228	8	250
Computing & Information Science	560	15,394	35	1,206
Interdisciplinary	79	2,031	10	439
Selection Committee on Research Grants			19	7,651
Selection Committee in Life Sciences			5	749
Sub-Total	7,290	222,698	722	40,537
Subatomic Physics[4]	133	12,418	12	4,014
Total	**7,423**	**235,116**	**734**	**44,550**

[1] Includes individual, group and project grants.

[2] Includes Equipment, Major Equipment and Major Installation Grants.

[3] Includes Multidisciplinary Network Group Grants.

[4] There are also 8 Major Facilities Access (MFA) awards in Subatomic Physics totalling $3.049 million.

New Funding Opportunities

NSERC has created three new funding opportunities—two to help researchers in the natural sciences and engineering better position themselves to compete for funding related to the new Canadian Institutes of Health Research, and one to provide support for genomics research activities that fall within the mandate of NSERC.

- **Collaborative Health Research Projects:** two competitions, one in 1999 and one in 2000, will fund health-related projects. Deadlines: July 1, 1999, and July 1, 2000.
- **Tri-Council Workshop/Networking Program:** proposals for workshops and networking that will bring the NSERC, SSHRC and MRC communities together to plan joint projects will be considered. Deadlines: June 15, 1999, and November 1, 1999.
- **Genomics Projects:** two competitions, one in 1999 and one in 2000, will fund genomics research projects in the natural sciences and engineering. Deadlines: September 15, 1999, and September 15, 2000.

For details, visit NSERC's Web site at www.nserc.ca/resear_e.htm.

New NCE Launched

Among those attending the launch of the Canadian Institute for Photonic Innovations (CIPI) at Université Laval's Centre d'Optique, Photonique et Laser (COPL), on May 27, were: (centre) the Hon. Stéphane Dion, President of the Privy Council and Minister of Intergovernmental Affairs; (far left) François Tavenas, Rector, Université Laval; H. Haugen, Theme leader: Ultrafast Photonic Technology, McMaster University; and William van Wijngaarden, Co-Scientific Leader (CIPI) York University; and (far right) H. Ruda, Theme Leader: Nanotechnology for Photonics, University of Toronto; Alain Villeneuve, Theme Leader: Engineering of Photonic Devices, Université Laval; and Michel Têtu, Co-Scientific Leader (CIPI) Université Laval. For information on the CIPI, the latest Network of Centres of Excellence (NCE), visit the NCE Web site, www.nce.gc.ca/news/99/dion_e.htm.

More Electronic Forms Coming

Following our introduction last fall of a Web version of Form 200 (Application for an NSERC Scholarship and Fellowship), we are developing Web versions of Forms 100 (Personal Data Form) and 101 (Application for a Grant). Both forms were recently revised and will be available electronically as well as on paper in August. You'll no longer need to purchase specialized software; everything is downloadable free of charge from the Internet. Consult our Web site (www.nserc.ca/resear_e.htm) frequently to see what's new in this area.

MITE Becomes the Newest Research Network

At its recent competition meeting, the Research Networks Selection Committee recommended funding for the Metals in the Environment (MITE) Research Network at $3.5 million over five years ($621,000 in year one).

MITE

Dr. Peter Campbell of the Institut national de la recherche scientifique (INRS-Eau) and his 22 collaborators at 11 other universities will work together to provide much needed knowledge on the sources, fate and impact of metals in the environment and their specific toxicological behaviour. The proposed research will be very useful in the formulation of environmentally responsible policies for the federal government and its partners. The network will be coordinated by Dr. Leonard Ritter, University of Guelph, Executive Director of the Canadian Network of Toxicology Centres.

The Mining Association of Canada (MAC), which represents the major mining companies in Canada, and Ontario Power Generation (formerly Ontario Hydro) will contribute a total of $1.45 million in cash over five years; MAC will provide a further $500,000 over the next five years to support MITE-related government research. Three federal departments (Natural Resources, Fisheries and Oceans, and Environment) as well as MAC and Ontario Power Generation will provide a further $2 million in kind.