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# Third Annual Canadian Science Policy Conference

## PROCEEDINGS BOOKLET

Ottawa, ON, November 16-18 2011

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Policy

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# Introduction: Mehrdad Hariri, CSPC 2011 Chair



Dear readers,

The third annual Canadian Science Policy Conference (CSPC 2011) was the largest conference we have held to date. We had over 500 participants - the most ever - with forty organizations agreeing to be our sponsors, community partners, or collaborators. Thirty two organizations submitted panel proposals, and in the end we had close to 100 speakers and moderators from various sectors and regions. Participants came from industrial sectors, from not-for-profit sectors, from government, and from academia; they came from Ontario, the Maritimes, the prairies, and the territories; they even came from America, Finland, Australia, and other nations. Indeed, CSPC 2011 proved an exciting place for anyone who believes that science policy is important, and that good science policy will help build not only a better Canada, but also a better world.

CSPC 2011 was a truly impressive collaborative effort, born and supported in our community by building an inclusive dialogue on science, technology, and innovation policy in Canada. CSPC 2011 was all the better for every person and organization involved.

We had an enormous network of very passionate volunteers, without whom the conference would not have happened. These volunteers are the first people that should be thanked for their efforts. Our financial supporters must also be thanked for their generous sponsorship and integral role in making the conference possible, and the members of our honorary and advisory committees deserve thanks as well, most especially for all their advice and insight.

The world is in a moment of economic turmoil and transformation. New leaders are emerging, each of whom sees ever more clearly the role of science, technology, and innovation in social and economic development. Science itself is changing as well, of course, as by its very nature it never ceases to change and improve. Compared with the science of the 20th century, science is now being done differently, by different people, and in different places. Science is now understood and accessible by more people than ever before. All of this change is very important and promising, as science, innovation, and competition policies shape the ways that knowledge and research are incorporated into the economic and social fabric of nations. New, more accessible, more comprehensible research therefore holds the promise of new, more prosperous societies; the opportunity to mobilize 21st century science for social progress through effective science policy is an opportunity we must not miss.

But with radical shifts taking place in the way science advances, science policy needs to be upgraded. Our question is this: is our science policy landscape ready to pave the way for Canada to remain an innovative, scientifically rich and competitive nation, 20 years down the road?

The State of the Nation reports from 2008 and 2010, as well as the Jenkins' Panel Report of 2011, all spoke about the need for cross-sectoral collaborations, stronger linkages across the science policy landscape, increased dialogue amongst all science policy stakeholders, and new initiatives promoting investment in

science's soft infrastructure. They spoke of the need for effective evaluation and assessment of policies, and the need to engage the next generation in science policy efforts - building capacity and mechanisms to train the younger generation to become the leaders of the future.

In planning CSPC 2011 we asked our community about gaps in the science policy landscape, the role that the conference could play in bridging those gaps, and the prospects for a national science policy centre. There was a strong response from a variety of stakeholders supporting the value of the CSPC, a unique venue in which to collaboratively develop insights on the emerging issues of science and innovation policy in this country. Attention was also paid to the current lack of science policy coordination, as well as the need for increased inclusiveness (for example, by bringing the private sector into the dialogue) and a cohesive science policy environment that can facilitate a robust science, technology, and innovation-based economy. Many organizations also spoke to us about the need for CSPC to become **the** national, multi-sector, and multi-disciplinary forum on science, technology, and innovation policies.

Let me be clear: if CSPC is to continue, the community must step up and provide ongoing financial support so that its operations may be stabilized and professionalized. CSPC has moved beyond the realm that even our most passionate community of volunteers can maintain, and its responsibilities to the community cannot be met without community support.

It is in recognition of this need to upgrade our science policy infrastructure that we have developed a strategic plan for creating a new science policy centre. The proposal is based on three pillars:

1. Establishing a hub for a dynamic network of stakeholders in science and innovation policy
2. Inspiring young people to enter science policy with an eye to generating the next leaders in the science policy arena
3. Supporting the development of the study of science policy in Canada so we can know how things worked out in the past to inform our choices for the future

Creating a well funded science policy centre will allow the entire network of science policy stakeholders in Canada to be engaged in thinking about the issues that challenge us and the opportunities that await us. It will ensure that the best and the brightest come forward and consider science policy a key component of Canada's future prosperity. It will, ultimately, help make Canada's policies for science, innovation, and competition the best they possibly can be.

We call this Science Policy 2.0. We think it is time for an upgrade.

Please enjoy this proceedings booklet, an excellent record of CSPC 2011, and a testament to the challenges and opportunities faced by our community in the coming years. Together, there are no challenges that cannot be met, and no opportunities that cannot be seized. We are counting on your continued participation and support to help us make it happen, and look forward to engaging with you all over the coming years.

All the best,



Mehrdad Hariri  
Organizing Committee Chair - Canadian Science Policy Conference

# CSPC Special Sessions

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## Keynote Address: Hon. Gary Goodyear, Minister of State (Science and Technology)



Speaking to the CSPC for his third consecutive year, the Hon. Gary Goodyear began by noting that the CSPC has become the premier annual science policy event in Canada. He praised the impressive and informative array of panels offered, and commended the organizers and participants for their commitment to Canadian science and Canadian science policy.

In the time since he spoke at last year's CSPC in Montreal, Goodyear said, the federal government has made great strides in creating a "brain gain" for Canada by improving support for academic research. Not only has the government renewed its commitment to the Vanier Scholarships for leading doctoral students studying in Canada, but the past year also saw the introduction of the first Banting Fellowships, designed to help top-tier post-doctoral fellows become research leaders. The federal government also financially supported the establishment of new institutions, such as the Stephen Hawking Centre at the Perimeter Insti-

tute in Waterloo. These initiatives, Goodyear asserted, make Canada a worldwide beacon for excellence in academic research.

Of course, Goodyear continued, the federal government also remains strongly committed to supporting innovative small and medium-sized Canadian businesses. One major achievement has been the renewal of the National Research Council, and in particular its Industrial Research Assistance Program, which works closely with innovative small businesses. Good science, he said, is good commerce.

Along with continued investment in education and business, Goodyear was pleased to announce the government's continued direct investment in R&D through the phase 5 of the Genomics Research and Development Initiative (GRDI). Past phases of the GRDI have already had substantial benefits in terms of spin-off industries, resource management, and public health. Phase 5 is expected to achieve

additional outcomes in health care, food and water safety, and environmental sustainability.

Goodyear acknowledged the uncertain state of the global economy, and while Canada has fared better than some countries, he stressed that we must remain committed to long-term economic growth. One reason why the CSPC is so timely and important is that this growth will be driven in large part by science and innovation. The CSPC's motto, "Building Bridges for the Future of Science Policy," underlines the fact that industry, academia, and government must work together to meet our economic challenges.



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# GPS Genome Canada - Genomics and Regulatory Science

## Organizer

Genome Canada, as part of their GPS series: where genomics, public policy, and science meet

## Moderator

Karine Morin: Director - National GE3LS Program, Genome Canada

## Speakers

G. Bruce Doern: Professor Emeritus - Carleton University

Peter W. B. Phillips: Professor of Public Policy - Johnson-Shoyama Graduate School, University of Saskatchewan

Kwasi Nyarko: Regulatory Science Advisor - Office of Policy and International Collaboration, Health Canada

Erika van Neste: Innovation and Growth Policy Division - Strategic Policy Branch, Agriculture and Agri-Food Canada

Vratislav Hadrava: Director, Regulatory Affairs - Pfizer Canada Inc.

## Moderator: Karine Morin

Director, National GE3LS Program, Genome Canada

This panel, part of Genome Canada's ongoing Genomics, Public Policy, and Society (GPS) series, was convened to discuss a draft policy brief authored by G. Bruce Doern and Peter W. B. Phillips on regulatory issues surrounding genomics research and related applications. Morin, the moderator, explained that GPS briefs are intended to improve evidence-based public policy, and the commentators and audience were invited to offer suggestions to be incorporated into the final version.

## G. Bruce Doern

Professor Emeritus, Carleton University

Doern began by explaining that there is no single genomics regulatory commission in Canada. Canada has a complicated, multi-level regulatory system that includes granting bod-



ies, the legal system, government departments at the federal, provincial, and international level, and even self-regulation to some extent. This Canadian "genomics regulatory system" is increasingly boxed-in, Doern explained, by rising expectations from businesses, consumers, and patients. At the same time, the system is required to process increasingly large num-

bers of products, and has slowed to a crawl. The main problem, Doern argued, is that the regulatory system imposed onto genomic-based applications preexisted the development of this field of research and technology, making the regulatory process complex and confusing.



## Peter W. B. Phillips

Professor of Public Policy, Johnson-Shoyama Graduate School, University of Saskatchewan

Given the present state of genomics regulation, Phillips focused on four major areas of concern covered in the policy brief.

First, it is possible that the problem is a lack of leadership at the federal level, in which case the present majority government may resolve the matter by imposing a new regulatory system. This may be possible, Phillips continued, but there is no guarantee it would work well.

Second, Canada's regulatory system is embedded in a larger international community. It is difficult, therefore, for a single state to maintain a distinct regulatory system that deviates from the norm. As a result, national systems tend to harmonize over time. In this case it may be possible to let this international harmonization process continue to improve the regulation of genomics-based applications.

The third area Phillips identified is self-regulation. This, he stressed, is not an imposition of neoliberal dogma, but a recognition that genomics research is already self-

regulated. Phillips considers this a developed but unrecognized aspect of regulation.

The fourth topic covered by the brief is the rise of socio-economic considerations in developing regulatory frameworks, which Phillips discussed with caution. Those in favour of regulating genomics-based technologies argue that their full effects are often unknown and merit considerable scrutiny, while many in industry see such concerns as simply delaying or rejecting what we know to be safe and effective technology.



## **Kwasi Nyarko**

Regulatory Science Advisor, Office of Policy and International Collaboration, Health Canada

In his commentary, Nyarko stressed that any modifications to Canada's regulatory system must be mindful of the dual role regulators play as both guardians of our collective well-being and enablers of innovation. While regulatory regimes must ensure product safety and consumer choice, they should not do so in a way that stifles industry's ability to innovate. This is particularly true in Canada, Nyarko said, where regulatory systems are centred on products, and not necessarily technologies themselves. Delineating and clarifying the roles of various regulatory and governmental bodies would be useful steps toward a more streamlined regulatory policy.

## **Erika van Neste**

Innovation and Growth Policy Division, Strategic Policy Branch, Agriculture and Agri-Food Canada

Van Neste pointed out that genomics is applied in many areas, and the regulatory context can be very different in each: while there may be high consumer demand for new medical products, for example, there is sometimes resistance to new agricultural products. With this in mind, van Neste argued that the right approach would need to have considerable plasticity to deal with different tech sectors without relying on distinctions that are based on the method of development. Like the report's authors, van Neste was skeptical that socio-economic fac-

tors were long-lasting enough to form a solid foundation for policy. However, she did think that some novel approaches—such as full open-source assessment—were worth investigating.

Van Neste closed by noting that although the genomic regulatory system is slow and overstressed, this is a result of many factors. Canada's regulations are quite progressive when compared globally, so to improve our system we should remember to consider all relevant factors together.

## **Vratislav Hadrava**

Director, Regulatory Affairs, Pfizer Canada Inc.

Hadrava began by praising the brief as neutral and well-documented, but also said he wanted to see more about how consumers, product suppliers, and other stakeholders see their own roles in the system. He agreed with fellow panelist Nyarko that regulations are not only barriers but also enablers of innovation, particularly in the health sciences. From a health science perspective, Hadrava continued, new products can be used for diagnostics, research, or treatment, and regulations need to address these three kinds of products differently. Notably, Hadrava was pleased that the brief recognized that science is not and should not on its own decide future regulations; socio-economic considerations, he said, have their place.

In closing, Hadrava reminded the audience that laws are interpretable, and not all policy changes require legal changes. Using the whole spectrum of regulatory tools and oversight (e.g. guidelines, policies, etc.) could be a practical way forward.

## **Discussion**

The first audience comment was from a member of the applied science industry, who thought that before adding additional socio-economic-based regulations, we should ensure people are properly educated about what kinds of regulations exist already. Along the same line, a second audience member worried that "socio-economic" was not defined carefully enough to evaluate the proposal. Direct-to-consumer advertising, for example, is probably a bad socio-economic influence, but consumer choice is still important.

A third audience member asked Hadrava specifically about the difference between regulating products and behaviour (such as advertising). With pharma products, Hadrava responded, some regulations affect behaviour in that they determine how a product may and may not be advertised, rather than the products themselves. However, Hadrava cautioned, the emerging field of personalized medicine may require further regulations on behaviours to protect patients and consumers.



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# Review of the Jenkins Report on Federal Support of R&D

## Organizer

Canadian Science Policy Centre

## Moderator

David B. Watters: President - Global Advantage Consulting Group Inc.

## Speakers

Celine Bak: Partner - Russell-Mitchell Group

Dan Clow: Director of Policy, Advocacy, and Alliance Development - GlaxoSmithKline (GSK)

Michael Turner: Vice President of Systems Strategies - Wesley Clover International

## **Moderator: David B. Watters**

President, Global Advantage Consulting Group Inc.

David B. Watters, the moderator, began the panel with a positive overview of the recently released Review of Federal Support to Research and Development (the Jenkins Report). Watters was pleased that the Report adopted a broad definition of innovation, and praised its conclusion that the large number of federal programs offered meant no clear answer could be given regarding which were most effective. While he argued that Canada places too much emphasis on indirect support for innovation industries, and not enough on direct support, Watters praised the Report for its focus on procurement and encouraging stronger partnerships with the private sector.

Watters closed with a few criticisms of the Report: first, he claimed that not examining programs aimed at helping firms go global was a significant omission; second, the report did not



address entrepreneurship skills training or a youth-based perspective; and third, the Report lacked a sense of urgency and set no innova-

tion targets. Canada has, he noted, failed to meet innovation targets in the past, and if we

continue to do so we risk falling behind global competitors like China.

## Celine Bak

Partner, Russell-Mitchell Group

Celine Bak's talk focussed on the opportunities the Jenkins Report presented for building bridges between small- and medium-sized enterprises (SMEs), large technology adopters, and academia. Bak first addressed Canadian

themes in innovation. Despite the rising Canadian dollar, Canada's propensity to adopt new technology has worsened in the last three years. This means that innovative small companies have trouble finding domestic customers. We should, however, care about SMEs, since they account for 53.4% of the GDP. Furthermore, Bak claimed, the Hon. Gary Goodyear was incorrect when he recently said Canadian SMEs do not invest in R&D: in fact, they are significant investors, and account for 45% of R&D spending. They also provide significant direct employment: clean technology is almost as big an industry as mining, and has the opportunity to grow much larger in fewer than ten years.

Bak then addressed global opportunities in technology, with a focus on clean technology. Currently, global clean technology is a trillion dollar industry, but within ten years it will grow to three trillion. Canada needs to have adequate sector strategies in place to take advantage of this. Even a 2% share of the global clean technology market would be as big as our automotive sector. Today Canada has an 8% market share, and within 10 years we could have a clean tech sector as large as the oil and gas industry in Canada. We can do it, Bak urged, if we keep a steady pace of investment and innovation.



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## Dan Clow

Director of Policy, Advocacy and Alliances Development, GlaxoSmithKline (GSK)

Dan Clow offered a pharmaceutical industry perspective on the Jenkins Report. Although pharma companies are significant contributors to innovation R&D in Canada, Clow said these companies are struggling in terms of R&D-to-sales ratios, with an industry-wide ratio of less than 10%. A major reason for this is that clinical trials, which account for 75% of R&D dollars in Canada, have declined dramatically. Canada is not a competitive environment for trials, and Clow stressed the need to align incentives and remove impediments. In terms of intellectual property rights, for example, Canada is not a global leader.

Like Watters, Clow also argued that Canada has too much indirect support for innovation and not enough direct support. The net cost of

running a trial in Canada and Germany might be the same, but the up-front costs are completely different. Clow praised the Report for its focus on procurement, since Canada ranks very low in terms of pharma-product purchases. This means that Canadians do not get access as soon, if at all, to new medical technologies.

Clow finished by criticizing the Jenkins Report for being too general, in that it did not address sector-specific strategies. Overall, however, he said he was largely happy with the Report; but the devil, he cautioned, is always in the details.

## Michael Turner

Vice President, System Strategies, Wesley Clover International

Michael Turner discussed what he described as the frustration felt by SMEs in Canada, and alleged that the Jenkins Report's recommenda-

tions are not adequate to address it. Turner criticized the government for the many eligibility restrictions placed on firms for receiving SR&ED tax credits, which are vital to start-ups. The Report proposed to base SR&ED on salary costs, but Turner claimed this is insufficient. Instead, he argued, refundability should be extended to all companies, and eligibility limits on revenue need to be raised. Applying refundability to foreign-owned companies working in Canada, for example, would help keep jobs in Canada.

Turner then argued that while both industry and academia are necessary, commercialization and new companies create jobs, not universities.

Rather than an innovation gap, Canada has a commercialization gap. One major reason for this is that venture capital investments have decreased by two thirds in the last decade, and a new Canadian company now receives about 38% the funds a US company would.

While venture capital is not a panacea, we need good management with smart money. Turner closed with a rallying message towards vigilantly boosting productivity and creating real jobs.



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# Major Issues in Canadian Science Policy

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# Keynote Panel: Big Picture Perspective on Science and Innovation Policy

## Organizer

Canadian Science Policy Centre (CSPC)

## Introductions

Suzanne Fortier: President - Natural Sciences and Engineering Research Council of Canada (NSERC)

## Moderator

Véronique Morin: Science Journalist - Tele-Quebec

## Speakers

Rémi Quirion: Chief Scientist & Chariman of the Board - Fonds de recherche du Québec

Ian Chubb: Chief Scientist - Australian Government

R. Peter MacKinnon: President - University of Saskatchewan and member of the STIC State of the Nation Working Group

## Introduction: Suzanne Fortier

President, Natural Sciences and Engineering Research Council of Canada (NSERC)

After thanking the conference organizers, Suzanne Fortier stated that the future well-being of all countries depends increasingly on scientific innovation. Eloquent arguments for scientific innovation come from people in disadvantaged countries, she said, who see suffering and hardship on a daily basis. Those of us in advanced economies also understand that our future prosperity increasingly depends on our innovation capacity. Prosperity, she continued, is now understood not just in economic terms, but also in terms of its social and cultural elements. As a result, we are in the midst of a global transition, which presents great risks but also great opportunities.

Good public policy, Fortier concluded, will not only address immediate issues; it will also give



us the wisdom and imagination to see the bigger picture as we move forward. She then asked the panelists to introduce themselves and their connection to science policy before beginning the discussion.

Ian Chubb explained his role as Chief Scientist for the Australian Government. His job is both to advise the Australian government about scientific issues of interest, and to bring to their attention issues they should be interested in

when they are not. Public outreach is also a large part of the job, Chubb said. By promoting trust in science and scientific institutions, Australian science can prosper.

Rémi Quirion told the audience that although he was only recently appointed as Chief Scientist for the Fonds de recherche du Québec, the position is rewarding and challenging. Québec has three councils, one for health, one for nature and technology, and another for social as-

pects and humanities. Quirion sits on the boards for all three, giving him insights into how these different sectors work. Although Québec is small, he said, it has good scientists, and the main challenge now is to prepare the next generation of researchers for the interdisciplinarity that will be needed.

R. Peter MacKinnon joked that, as a law professor, he may seem out of place at the CSPC. However, as President of the University of Saskatchewan, he has become deeply involved in the construction of their new synchrotron, Canadian Light Source, which started him thinking about science policy. He also recently sat on the Science, Technology, and Innovation Council, which produces bi-annual national reports on the state of science and technology innovation. MacKinnon noted that, while Can-

ada faces many challenges, the reports have been largely positive.

## Discussion

Fortier began the discussion with a challenging question for the panelists. The world is in turmoil, she said, facing problems like climate change and population growth, but it seems like science has not found solutions to these problems. Why not? Can science do more?

Chubb responded that these are indeed big problems: the world now has seven billion inhabitants, with projected growth to nine billion by 2050, but we can only feed six billion. It would be madness, he said, to think we can survive by continuing on the way we have. The way forward must be through innovation and international collaboration. MacKinnon agreed,

stating that old economies are powerless, and only an advanced innovation economy could make progress. Quirion stressed the need for active collaboration, since these challenges must be met as soon as possible.

Fortier then asked what was necessary to bring useful innovations to the public. Chubb responded that collaboration is essential, but that in Australia researchers are not working together well. University-trained researchers in particular, he said, often have trouble working in an industry environment, which limits their ability to commercialize research. Perhaps re-vamping university training programs, and teaching students that a job in industry is not a second-best option, would help integrate the two cultures. Quirion and MacKinnon agreed that bringing together scientists and the private sector is essential. In this the MaRS Discovery District is exemplary, MacKinnon said, but our approach must be more comprehensive.

Since it may take a long time for research to yield commercializable results, Fortier suggested, it is often perceived as risky. MacKinnon agreed that good research can be a lengthy process, but that patience is essential at the policy level. In the rush to achieve results, he worried, we may not have the patience to build long-term capacity. Quirion commented that it is important to have a strong base of scientists that do general research, but that some focussed projects are also important, and these projects must be given the time they need. For





political reasons, Quirion said, arbitrarily short time limits may be set on research projects, and this should clearly be avoided where possible. Expanding on this, Chubb noted that it took decades to get from the identification of DNA to today's talk of personalized medicine, and that patience is indeed a virtue in scientific research. However, we must also help scientists get discoveries out of the lab and into the private sector.

Turning explicitly to the question of government, Fortier asked the panel if they thought governments adequately recognized the role of scientists as creators, and their need for the freedom to take risks. Quirion responded that, like the general population, some politicians understand science better than others, and scientists and policy-makers need to do their best to make sure politicians appreciate its importance. Politicians, MacKinnon continued, at-

tribute importance to what their electorate does, and given how poor science education is in Canada, it is possible that the public underestimates the importance of science.

Quirion agreed that the public's perception of science is important, and suggested that changing the education system, and the way we train our teachers, might help the public better understand the importance of science and technology in their lives. In a recent survey, he continued, an unacceptably high number of Australian teachers were required to teach out of their fields, thus limiting their effectiveness. A strong national science program begins in elementary school, he argued, and support for teachers at all levels is essential.

In closing, Fortier asked about immediate challenges facing science policy. MacKinnon responded that a lot of concern has been expressed in various reports, but the time for reporting is over. We need to move into serious policy, he argued, by setting real goals and trying to achieve them. Fortier agreed, stressing the magnitude of some of the problems we face and the need for global collaboration. However, she cautioned, public trust in science cannot be taken for granted. The scientific community needs to renew its commitment to high standards of integrity and responsibility, since preserving public trust in science is a key element in fostering innovations that will create a better world for us all.



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# Plenary Session: Building Stronger Communities Through Innovation

## Organizer

Canada Foundation for Innovation (CFI)

## Chairs

Gilles Patry: President and CEO - Canada Foundation for Innovation (CFI)

Marie Carter: Chief Operating Officer - Engineers Canada

## Moderator

Chad Gaffield: President - Social Sciences and Humanities Research Council of Canada (SSHRC)

## Speakers

Kevin Smith: President and CEO - St. Joseph's Healthcare Hamilton & St. Joseph's Lifecare Centre Brantford

Fred Morley: Executive Vice President and Chief Economist - Greater Halifax Partnership

Hon. Mike Harcourt: Lawyer, Community Activist, and Former Premier - British Columbia

Bruce Parry: Manager, Corporate Social Responsibility - Bombardier Aerospace

## Kevin Smith

President and CEO, St. Joseph's Healthcare Hamilton & St. Joseph's Lifecare Centre Brantford

Dr. Smith began the panel by explaining how innovation is being used to meet healthcare challenges in the Hamilton area. Healthcare in Hamilton has recently made great strides, Smith said, and the most important step has been aligning incentives with goals. Part of the strategy to lower physician wait times, for example, was to track performance. Of course, Smith continued, some wait times were long for good reasons; others, on the other hand, were not. Transparent methods permit this kind of evaluation, which allows us to formulate and implement evidence-based incentives directed toward clear goals.

If incentives are to be changed, Smith said, we need good alignment. This applies beyond healthcare, he said, encouraging the audience



to consider the resources they have control over, and ensure they are aligned with their goals. Aligning resources with goals at the tax level could help attract innovators, he suggested, also leading to a healthy economy.

## Fred Morley

Executive Vice President and Chief Economist, Greater Halifax Partnership

Morley, an economic development practitioner, discussed how innovation could be used to





grow Halifax's economy. Halifax today, he said, is like San Diego was twenty years ago: it was in decline, but had assets like universities and a few research institutes. Today, San Diego is thriving with 75 research institutes and over 3000 innovation companies. Halifax, Morley suggested, also has universities and research institutes, and could be poised for similar growth. However, he cautioned, while innovation systems, research transfer, money, and patience are all important, the most important element is a culture of innovation. Universities and private firms must trustingly work together, taking risks in partnership. True partnerships, he argued, are what makes innovation work in communities.

### **Hon. Mike Harcourt**

Lawyer, Community Activist, and Former Premier (British Columbia)

We have entered, Harcourt claimed, the urban century, and making the cities of the future livable and sustainable will require creativity and innovation. Global population growth is accelerating, and Canada is an urban country, with over 80% of its people living in cities. How, he asked, given the strain population growth will put on our infrastructure, can we ensure clean water, safe food, social justice, poverty reduction, and inclusivity for our citizens? The answer, he suggested, lies in sustainable city strategies. Cities can no longer finance themselves using property taxes alone, and, raising

the spectre of Detroit, he argued we need good urban models to move forward.

Despite these challenges, Harcourt closed on a positive note. By rethinking our municipal energy strategy, and taking advantage of the need to replace key pieces of infrastructure with green, novel alternatives in the next few decades, he claimed, we can help create a golden age of innovation.

### **Bruce Parry**

Manager, Corporate Social Responsibility, Bombardier Aerospace

Parry brought a business perspective to the panel, and discussed how Bombardier has combined innovation with social involvement. Bombardier entered the aerospace market only 25 years ago, Parry explained, but today it is the third-largest aircraft manufacturer in the world. Bombardier is a large economic contributor to Canada, particularly in the Montreal region, and its business is based in innovation. Every year, Parry said, Bombardier has launched at least one new aircraft program, and it collaborates with universities to ensure young students get excited about research. Bombardier also contributes socially. For example, in collaboration with the Red Cross, 800 employees were trained to provide disaster relief, and 188 Bombardier employees assisted when the recent flooding hit Québec. Bombardier, Parry concluded, is committed to provid-

ing jobs, developing research, and giving back to the broader community.

**Moderator: Chad Gaffield**

Social Sciences and Humanities Research Council of Canada (SSHRC)

Gaffield, the moderator, noted that all of the panelists had focussed on the challenge of enhancing the quality of life in Canada. For centuries, Gaffield continued, our public policy has focussed on individuals. Now, however, we are focussed on communities, since building successful communities is the key to individual quality of life. Sustainability and resilience are now at the centre of our thinking, Gaffield argued, and this is a fundamentally different way of approaching policy than we have seen previously.

**Discussion**

The first audience comment emphasized the importance of impact metrics, and suggested that citizen satisfaction should be of primary importance. Smith agreed that satisfaction is important, but the logic of satisfaction is different from the logic of emotion. Sometimes increasing perceived satisfaction in the short-run causes problems later on; as a result, political bravery can be important to keeping us on the right track. We need more work, he argued, on what satisfaction means, but we also need to accept that some people will always disagree.

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.....

David Phipps, from York University, asked the panelists if they had any thoughts about “shared value,” the idea that economic and social outcomes should be linked. Harcourt responded that firms exist in communities, so improving those communities makes good business sense. There is global competition for talent, Harcourt explained, and talented people want to live in sustainable cities. A city with high quality of life attracts talented people, and

talented people in turn raise quality of life, creating a virtuous cycle.

The last question noted that industry-academia partnerships are not always successful, and asked if the panelists had any advice for increasing the number and productivity of collaborations. Morley replied that real partnerships take work, and a good way of ensuring success is to have a shared vision and common, well-defined goal.

# Reaching Out with Big Science

## Organizer

TRIUMF and Canadian Light Source Inc. (Matthew Dalzell)

## Moderator

Matthew Dalzell: Communications Coordinator - Canadian Light Source Inc.

## Speakers

John Matlock: Director, External Relations and Public Affairs - Perimeter Institute

Tim Meyer: Head of Strategic Planning and Communications - TRIUMF

Penny Park: Executive Director - Science Media Centre of Canada

Jay Ingram: Science Broadcaster and Writer

## Moderator: Matthew Dalzell

Communications Coordinator, Canadian Light Source

Dalzell began by defining “Big Science” as a facility, installation, or network involved in research that cannot be accomplished by a single university or institution. Big Science is important to help make science accessible, he said, urging all major facilities to do public outreach, an altruistic process that contributes to scientific literacy in Canada. Pragmatically, this helps demonstrate accountability to taxpayers, and ensures a good return on the investment of public funds.

## John Matlock

Director, External Relations and Public Affairs, Perimeter Institute

Matlock explained that the Perimeter Institute was founded to advance science, but it also aims to provide educational outreach. The importance of theoretical physics is not widely understood, and the Institute’s mandate is to



research it and share it. Important consideration must always be given, Matlock stressed, to multiple audiences, high production values, and fostering relationships with educators and journalists. Big Science has, Matlock said, an incredible role to play in educating the public.

## Tim Meyer

Head of Strategic Planning and Communications - TRIUMF

Tim Meyer introduced TRIUMF, Canada’s national lab for particle physics, owned and operated by a consortium of Canadian universities. By pooling resources and sharing input and output, TRIUMF allows researchers to work

on questions no one institution could afford to. Big Science institutions like TRIUMF, Meyer argued, have unique capabilities for research, communication, education, and outreach. Keeping multiple researchers under one roof allows networking and exchange opportunities that are crucial to developing the long-term relationships needed in science. Meyer also endorsed social media as an excellent new communication tool.

## Penny Park

Executive Director - Science Media Centre of Canada

Park spoke about the Science Media Centre of Canada (SMCC), a recently formed nonprofit



designed to help journalists cover science as it happens. The SMCC's mandate is to improve the quality of science reporting by providing evidence-based and accurate science to journalists. This is necessary for two reasons: first, science is growing ever more complex, and many journalists are not specialist science reporters; and second, journalist deadlines are shrinking, with reporters now responsible for three times the number of publications they were 30 years ago. The SMCC also works to help journalists and scientists understand each other's cultures, and is part of a global network of science media centres.

## Jay Ingram

Science Broadcaster and Writer

Ingram noted that while his colleagues in science communication do exemplary work, there is a great need for scientists themselves to communicate better with the public. This is, however, difficult: while many scientists care about communication, they are incredibly busy, and have no time to learn to be effective communicators. Science media can play a key role here, since it can help the public to understand science without making the unfair demand that all scientists become expert communicators.

On a cautionary note, Ingram discussed the cultural cognition project at Yale Law School. Proponents of "cultural cognition" claim that the stance people take on scientific controversies has more to do with values than evidence. Strongly individualistic people, for example, will tend to downplay anthropogenic climate

change. Scientists have a "deficit model" of public misunderstandings, where they assume that simply providing more data will change people's minds. The Yale project shows this model to be false, Ingram argued. We cannot change people's minds simply by pouring more information into them.

## Discussion

Dalzell began by asking the panel whether science communication is pragmatic or altruistic. John Matlock and Tim Meyer both responded that effective science communication must be both. Penny Park added that information is vital to effective policy debates in democracies.

Alistair McGuyver, of Atomic Energy Canada, asked the panel whether Big Science communications could help reverse Canada's "brain drain." Meyer responded that Big Science projects like TRIUMF are magnets for skilled people from all over the globe. Communicating the results of Big Science gets people excited, drawing in top scientists and students.

The next question asked whether the stereotypical "geeky" media presentation of scientists detracts from effective information exchange. In Ingram's view, the media is more concerned with attracting viewers than portraying scientists in a specific light. If scientists want to be better represented they must get involved themselves. Expanding on this, Matlock added that the media has no patience for scientific details, but the public still has an appetite for science news. The key is figuring out how sci-

ence communicators can respect scientists, helping them be comfortable and at their best.

Murray Leslie, from Neptune Canada, asked the panel for advice on maintaining public interest in fields where developments are infrequent. One option, Ingram suggested, is to focus on people by telling compelling stories about scientific personalities. Park added that animation is a powerful tool that has worked well for NASA, but in some fields it may be unrealistic to expect more than periodic interest. The best long-term communication strategy, Matlock concluded, is to have good relationships with journalists.

Krister Shalm, from the Institute for Quantum Computing, noted that public outreach is sometimes discouraged in scientific circles, and asked if there was a network of outreach-minded scientists. Ingram praised Shalm's efforts, but responded that there is really no such network. In light of this, Meyer encouraged Shalm to look for partners, but not to wait for them. He further encouraged Shalm to attend, and perhaps present at, conferences like the CSPC and AAAS to help build a new network.

# Putting the Social in Canada's Innovation Policy

## Organizer

Office of Research Services, York University

## Moderator

Graham Carr: President - Canadian Federation for the Humanities and Social Sciences

## Speakers

Claudia Krywiak: Director, Partnership Development and Corporate Planning - Ontario Centres of Excellence

Allyson Hewitt: Advisor, Social Innovation and Director, Social Entrepreneurship - Social Innovation Generation

David Phipps: Director, Office of Research Services and Knowledge Exchange - York University/ResearchImpact

## Claudia Krywiak

Director, Partnership Development and Corporate Planning, Ontario Centres of Excellence

Krywiak began by noting that the Ontario Centres of Excellence (OCE), an organization devoted primarily to the commercialization of publicly funded research through industry-academia collaborations, has seen a rise in partnerships with not-for-profit organizations (NPOs) in their recent projects. While unexpected, these projects were great successes in terms of commercialization and social impacts. This led to the idea that OCE should launch a dedicated Social Innovation Program (SiP), tasked to bring NPOs together with academia and industry to work on projects addressing social and environmental challenges.

The SiP, Krywiak continued, has three unique features. First, its call to action differs from



other innovation programs. SiP projects focus on the areas of health improvement, environmental sustainability, and poverty reduction. Their best practice is an equal-footing partnership between NPOs, industry, and academia. Projects are designed to implement new ideas and address unmet needs in under-served communities. Second, SiP projects require a quantifiable social return on investment. Third, the SiP emphasizes the role of students as social innovators and entrepreneurs. Social en-

terprise has a place in the innovation ecosystem, Krywiak argued, and although the SiP is only four months old, it shows great promise.

## Allyson Hewitt

Advisor, Social Innovation and Director, Social Entrepreneurship - Social Innovation Generation

Allyson Hewitt introduced the audience to Social Innovation Generation (SiG), a national collaborative network with nodes across Can-

ada, based in the MaRS Discovery District. Although MaRS was initially founded to aid the commercialization of innovative life science research, SiG is tasked with creating a culture of continuous social innovation. This, Hewitt argued, reflects the growing awareness that the economic and the social are inextricably linked. Many young entrepreneurs would rather live their values now than give to charities later, and SiG projects are challenging the traditional picture of businesses and charities by putting pressure on both ends of this spectrum: charities are beginning to think of running social enterprises, and businesses are beginning to realize that they can have a direct social impact. Although SiG is still young, Hewitt argued, its projects have a record of success in terms of both commercial and social impacts.

## David Phipps

Director, Research Services and Knowledge Exchange - York University/ResearchImpact

Phipps brought the panel an academic perspective on social innovation. While many universities in Canada have tech transfer offices to facilitate commercialization of science and technology research, few schools have similar programs for the social sciences. This, Phipps argued, is an oversight, and the social innovation equivalent of tech transfer—often called knowledge brokering, or knowledge mobilization—is an important way of connecting industry, communities, and academia to share

knowledge and improve society. The York program has thus far brokered over two hundred successful collaborations, which range from brief community-academia get-togethers, to larger projects disseminating research results directly to concerned citizens. While money is not the point of knowledge mobilization, Phipps noted that the program has also successfully brought funds to both the community and the university. The real lessons, Phipps insisted, are that true social impact takes time, that the numbers only tell one part of the story, and that knowledge brokering is focused around the knowledge broker. Brokering is rewarding and important, but it is also time consuming, and it has to be a full-time position.

## Discussion

Graham Carr, the moderator, began by asking what qualities make a successful knowledge broker. Hewitt and Phipps both agreed that successful knowledge brokering requires not only speaking the many languages of business, academia, and government, but also the ambassadorial skill of creating a safe and welcoming environment. A further hidden benefit of knowledge brokering projects, Carr interjected, could be that they build capacity in NPOs through internships and student involvement. Phipps agreed wholeheartedly, and dismissed the notion that NPOs do not have enough money to innovate. The opposite is true, he argued, since the lack of funds forces innovation. The problem, as Phipps sees it, is that NPOs cannot effectively share their innovations.

Drawing on personal experience, Hewitt and Krywiak agreed that NPOs often have great initiatives but are isolated. Some NPOs, Krywiak added, have even expressed interest in OCE's start-up programs, with an eye toward developing business capacity and generating new revenue.

Louise Shaxson noted that while knowledge brokering is often portrayed as a neutral process, this kind of intervention can change power dynamics, and is always a political act. Must knowledge brokers, she asked, be politically aware, or avoid certain political topics? Phipps responded that the brokers he manages do not avoid specific topics, but do avoid types of engagement. He will not, for example, take part in community advocacy, but neither will he help faculty get consulting business. Brokers try to foster relationships that benefit both academic and community partners, and in this sense, Phipps said, they remain neutral.

Rick Riopelle, an innovation scientist at McGill, asked for more information about measurement in social innovation. Measurable indicators, Krywiak responded, are essential to quantify social impact, and for best results metrics should be built into projects right from the start. Expanding on this, Phipps cautioned that while counting is not measurement, and we must be careful not to focus on the wrong kind of quantification, we can only evaluate projects if we can measure their results.



# Education and Training of Scientists

## Organizer

University of Cambridge, UK (David Kent)

## Moderator

David Kent: CIHR Postdoctoral Fellow - University of Cambridge

## Speakers

Angela Crawley: Vice Chair of Operations - Canadian Association of Postdoctoral Scholars

Olga Stachova: Chief Operating Officer - Mitacs

Alan Bernstein: Founding President - Canadian Institutes of Health Research (CIHR), 2000-2007

Suzanne Fortier: President - Natural Sciences and Engineering Research Council of Canada (NSERC)

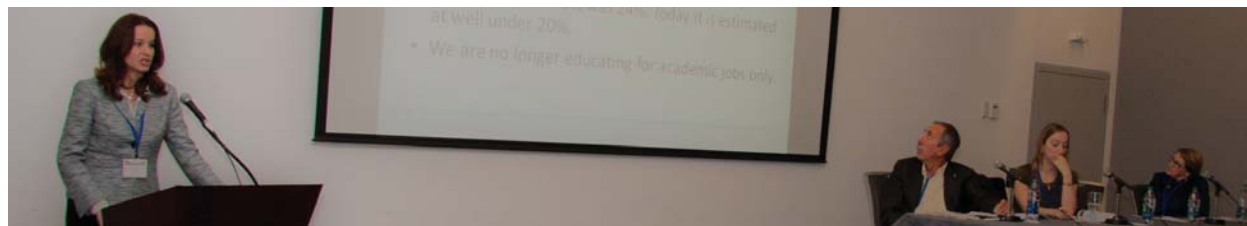
## Moderator: David Kent

CIHR Postdoctoral Fellow, University of Cambridge

Kent identified a problem he sees with innovation in Canada. Canada successfully trains scientists to make significant science contributions, but it often fails to commercialize products. Recently, the Canadian science model has emphasized investing in infrastructure, and often uses tax credit schemes to encourage businesses to invest in R&D and turn the science into products. This model, he said, does not pay adequate attention to people. Kent argued that our lack of innovation is due to our lack of investment in people; Canada over-invests in things, and under-invests in people. Accordingly, the focus of this panel is Canadian investment in people, considered not just as a resource but as a driver for innovation.

## Angela Crawley

Vice Chair of Operations, Canadian Association of Post-doctoral Scholars



Crawley began by explaining that postdoctoral fellows (“postdocs”) are temporary professional mentorship positions that exist so scientists can collect enough experience in their field to transition into a career. Postdocs are young, talented individuals, so making sure that excellent postdocs stay in Canada is important. Unfortunately, many postdocs are better funded at the graduate level in Canada, so some end up pursuing other opportunities that present themselves. This is a concern for Canada, as a low percentage of PhD recipients are going on to receive a tenured position at Canadian universities. As a result, many graduates end up leaving academia.

Crawley suggested we should not view those who leave a postdoc to enter into a career outside of academia as failures, but that we should view postdocs as more than a stepping-stone to an academic career. Understanding the validity of alternate career paths would benefit Canada’s postdocs. Increased accountability on the part of universities and industry should help us assess our investment in postdocs, and training guidelines, incentives, and clarity around career goals would better Canada’s post-doctoral climate overall.

## Olga Stachova

Chief Operation Officer, Mitacs

Stachova began by discussing Canada's interest in transitioning from a resource-based economy to a knowledge-based economy. A strong knowledge-based economy requires a critical mass of workers with advanced degrees, so Stachova is skeptical of the claim that we are producing too many PhDs. Recruitment, training, and retention of talent is essential.

Though it is extremely difficult to find a job in academia, Stachova echoes Crawley's claim that we need to change the mindset of academics to view a job outside academia as desirable, saying we should make sure we are teaching our PhDs the business and professional skills needed to succeed outside of academia.

Career transitions would be smoother, she argued, if industry had a better appreciation for the value of highly skilled workers. Canadian companies have statistically low expenditures for R&D, with heavy emphasis on developing products rather than researching. Stachova suggested that graduate students would benefit from universities and industry developing closer ties. Internship-style training programs (like *Accelerate*) and postdoctoral programs connecting researchers with organizations who might be interested in their work (like *Elevate*) are promising steps to remedying some of the issues with career transitions. Such programs increase industry readiness, increase participation in R&D training, make more jobs available by increasing demand, and ensure that PhDs have research management expertise to set up their own R&D groups.

## **Alan Bernstein**

Founding President, Canadian Institutes of Health Research (CIHR), 2000-2007

Alan Bernstein also placed people at the centre of innovation, arguing that if people don't see a future for themselves in an innovation economy, the innovation agenda will fail. Bernstein identified some interesting careers that are not often on the radar of young trainees, including careers in science diplomacy. He stated that many embassies have a cultural attaché, so the creation of a science attache is also quite viable.

Like Stachova, Bernstein rejected the idea that Canada is producing too many PhDs, as there remains need for highly educated individuals. He argued that science, technology and innovation are at the core of every "big solution." PhDs are analogous to pluripotent stem-cells, as they have infinite potential. What is crucial is shaping these trainees and making clear the importance of mentorship. Internship programs are valuable because they allow trainees to have a mentor in industry alongside with their mentor in academia.

## **Suzanne Fortier**

President, Natural Sciences and Engineering Research Council of Canada (NSERC)

Fortier, too, discussed the need for highly educated and talented individuals in Canada. Canada is progressing in this respect, but is still behind many other countries. Fortier claimed that jobs need to be created for our up-and-coming trainees, a challenge for those entering

science and technology fields. There is a wide responsibility to nurture and attract talent before skilled individuals leave to follow other opportunities. Being more conscious of the funding available for postdocs outside of Canada is one part of retaining talented Canadians, and attracting researchers from abroad. Offering training that excites people to participate in innovation is also very important.

Good funding programs can facilitate the success of trainees, Fortier said. A good example of this is the Collaborative Research and Training Experience Program, which thinks differently about how we train graduate students. This program has the goal of providing a rich environment for training, connected with the realities outside of academia.

## **Discussion**

Discussion continued surrounding the number of PhDs produced in Canada. Crawley noted how difficult it is for an academic to train a student for an industry position. Fortier distinguished between creating too many university professors and creating many talented, creative and intelligent workers.

One question addressed the slow speed at which internship-style training programs are being developed. Stachova suggested that universities are not yet receptive to these programs.

A member of the audience suggested the issue is not how many PhDs are produced, but whether they're the right kind to meet public needs. Crawley agreed that that is important.

# The Role of K\* in Strengthening Science-Policy Integration

## Organizer

UN University Institute for Water, Environment, and Health (UNU-INWEH) and Environment Canada

## Convenors

Alex Bielak: Senior Fellow and Knowledge Broker - United Nations University's Institute for Water, Environment, and Health (UNU-INWEH)

Shannon deGraaf: Senior Science Policy Analyst, S&T Liaison - Environment Canada

## Speakers

Jason Blackstock: Senior Fellow - Centre for International Governance Innovation (CIGI) and Research Scholar - International Institute for Applied Systems Analysis, Austria

Amanda Cooper: Program Director - Knowledge Network for Applied Education Research (KNAER), University of Toronto

Katrina Hitchman: Manager of Strategic Programs - Canadian Water Network (CWN)

David Phipps: Director, Research Services and Knowledge Exchange - York University/ResearchImpact

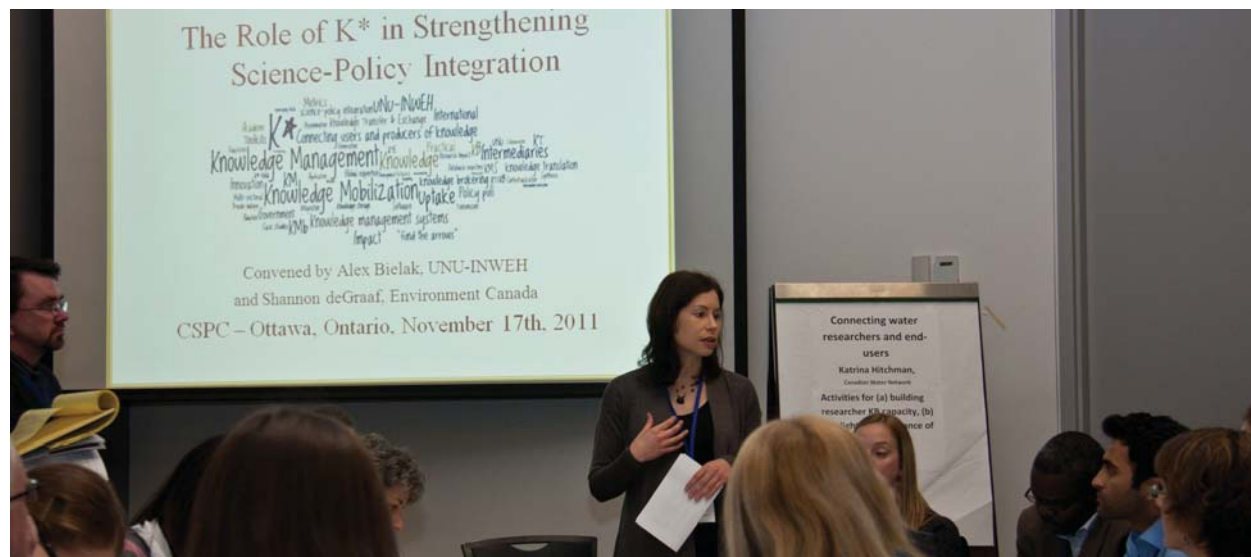
Louise Shaxson: Senior Research Fellow - Research and Policy in Development Program (RAPID), Overseas Development Institute (UK) and Associate - Delta Partnership

## Introduction: Alex Bielak

Senior Research Fellow and Knowledge Broker, UNU-INWEH

Bielak opened the session by noting that, given there were about twice the number of participants than expected, there appears to be considerable appetite for K\*. He explained that K\* (pronounced “K-Star”) is an all-embracing term referring to Knowledge Translation, Brokering, Mobilization, Transfer, Management and Exchange – a term coined at CSPC 2010, in fact.

Within the worlds of research and policy there is growing awareness of, and commitment to, the role of intermediaries and intermediary organizations. They are increasingly seen—by various parties including research providers, users and funders—as ensuring that research directions are informed by the potential users, that users are strategically involved in research, and that research findings are accessible and put to use in decision-making. This



emerging yet diffuse field is increasingly assisting users in experiencing better value for investment, and has seen considerable growth in the last decade. While some have suggested that K\* is unnecessary, as scientists and policy-makers would ideally do it themselves, Bielak argued that scientists and policy-makers are often too busy, or may not be aware of devel-

opments in other fields that might be relevant. So while the value of K\* needs to be better demonstrated (and evaluated) in order for its importance to be better understood, many have already recognized its importance, evidenced by the growing number of excellent publications and panels recently devoted to the subject (such as the IDRC's *The Knowledge Transla-*



# ROUNDTABLES



tion Tool Kit). In fact, the UNU-INWEH will be hosting an entire conference on K\* in April 2012.

Bielak explained that this panel would be more like a collection of parallel roundtables than a panel discussion. Each panelist was to give a brief “pitch,” explaining their interest and experience in K\*, after which the panelists would sit down at separate tables for presentations and discussions with session participants. After two separate rounds of discussion, someone from each table would report back to the group as a whole.

## **Jason Blackstock**

Senior Fellow, Centre for International Governance Innovation (CIGI) and Research Scholar, International Institute for Applied Systems Analysis, Austria

Blackstock began by explaining that his primary work in Canada and internationally was centred around the mobilization of knowledge towards a low carbon future. Recognizing the importance of relationships for driving innovation, Blackstock said he would be discussing how he engaged community discourse, brought people together, and set up the right kinds of conversations on a long-term basis, as well as the relationships and processes that inform future discussions. His table, he said, would be talking about innovative *processes* for K\*, because K\* is “about the knowledge system as a

whole and how you have processes that interconnect all the different people across different disciplines.”

Discussion: Blackstock’s discussion centred around the frustration that people of diverse technical backgrounds can have when working together on shared problems, simply because they do not share a common language and set of priorities. Mitigation techniques Blackstock has found successful involved a) preparing them for such frustration and b) giving them a clear goal to keep in mind. But K\* is more than this “front-end” work, and should ideally include “back-end,” mentoring to make sure people maintain the linkages they form in producing a common product. Among successes were the ability to define a clear problem (take

a vision of low-carbon society and plot a course to get there), while barriers included lack of prior planning as to who would facilitate ongoing relationship building and the mechanisms to do so after the event.

### **Amanda Cooper**

Program Director, Knowledge Network for Applied Education Research (KNAER), University of Toronto

Cooper explained that she is currently managing the Knowledge Network for Applied Education Research (KNAER), an effort to increase research use in education. She and her colleagues, she explained, think about knowledge mobilization as occurring across three domains: research production (e.g. think tanks, universities), research use (school districts, policy-makers), and intermediary organizations (facilitators and mediators of research use). Her expertise with intermediary organizations comes from both the education and health sectors, she explained, saying that her table would be discussing a) ways people can build knowledge mobilization plans for their organization, b) practical tools for doing so, and c) how to use intermediaries that already exist so as to not “reinvent the wheel.”

Discussion: Cooper’s table provided participants with a succinct view on the important role knowledge intermediaries play in various organizations, but concentrated on discussing how to make a knowledge mobilization plan. To overcome a knowledge gap, the first and

most important stage is to evaluate what kind of gap exists, as such evaluation permits a strategy for overcoming it. Key things to think about when creating a K\* plan are: Who do you target? What research evidence do you have? How do you make it part of your organization? What are the existing mechanisms?

### **Katrina Hitchman**

Manager of Strategic Programs, Canadian Water Network (CWN)

Hitchman explained the role of her organization—the Canadian Water Network (CWN)—in connecting national multidisciplinary researchers and partnerships to explore better decision-making on water management. Currently CWN is moving from a “project-based, research-push” approach to a “consortium-based, end-user-pull” approach. “Through this program,” she explained, “we’re engaging in extensive consultation with end-users to determine their shared decision needs, and ... to determine which of these shared needs can be addressed through research that we would then collectively fund.” CWN helps funding applicants look for additional funding, e.g. through a newly developed online partner-to-research matching process. Once research has been approved for funding from CWN, CWN facilitates joint meetings between end-users and researchers through all phases of the research process so that research is continually focused on end-user needs. So, her table would be dis-

cussing activities that a) build researcher and end-user capacity to engage in K\* work and b) showcase the importance of K\* in producing research that meets end-user needs and ensures the decision-making implications are understood by researchers and policy-makers.

Discussion: Hitchman’s presentation produced some key questions in the development of K\*, like how do you define the end user? How do you determine research priorities? CWN’s approach has been to involve all parties in the decision-making process, asking researchers to remove the technicalities from their research to make the information accessible to policy-makers and decision-makers. While many questions were raised and responded to, others remained unanswered, due to the short time frame available for the discussions (something lamented by several other rapporteurs). What was clear, however, is that the most important parts of the system were end-user engagement and proper evaluation.

### **David Phipps**

Director, Research Services and Knowledge Exchange, York University/ResearchImpact

Drawing analogies to institutions that support the university-based commercialization sector in the US, Phipps asked the audience, “What can the universities do to connect researchers and graduate students to organizations outside of the university—this is the private sector, not-for-profit sector, community sector, gov-

## **ROUNDTABLES**

## ROUNDTABLES

ernment sector—who are interested in working on social issues?” This is what the Knowledge Mobilization Unit at York University and ResearchImpact do, and it has nothing to do with “licensing patents” or “making money.” His roundtable would be themed around ways to connect universities to communities, forming creative collaborations for social innovation, specifically the “green economy centre” which is a K\*-oriented institution aimed at helping rural businesses make green decisions.

Discussion: Phipps’s presentation focused on his unit at York University and ResearchImpact. While the factors driving knowledge mobilization are not new, he said, universities have recently invested more into building capacity for knowledge mobilization. Knowledge mobilization efforts are meant to complement existing institutions such as tech transfer offices; but whereas money is a motivator for tech transfer, in a lot of knowledge mobilization work money is (at most) a metric. Some key points from his discussion were that good research work is created on the foundation of sustainable relationships, and that K\* practitioners need to reach out beyond their sector, geography, and traditional roles to provide unique learning opportunities.



### **Louise Shaxson**

Senior Research Fellow, Research and Policy in Development Program (RAPID), Overseas Development Institute (UK) and Associate, Delta Partnership

Speaking from a broad background in K\*, Shaxson explained that her table would be talking about the different ways that the UK and Canada, Australia, and NGOs have historically approached K\*. In Australia, for instance, K\* practice comes from a grassroots mobilization of farmers and conservationists that subsequently became institutionalized by Land and Water Australia. International development is often more top-down, as the example of World Neighbours (an NGO) makes clear.

Discussion: Shaxson’s table discussed three main points. First, history is important for understanding K\* practice. Understanding how K\* is practiced in different areas gives you cer-

tain insights, but understanding how it got there gives you more, different insights, e.g. into why different communities have different K\* practices. Second, K\* is not just about brokering knowledge, it is also about the social, political, and intellectual environments that enable knowledge to be put to use. And third, K\* is inherently political, as interpolating yourself between producer and user of knowledge changes the power relations between them, something all K\* practitioners need to think carefully about.

Also, there is a swing from evidence-based policy (K\* in Canada/UK came out of the health field and evidence-based medicine) to evidence-informed policy. Knowledge needs to be transferred into *useful* evidence, making the knowledge usable and communicable.



# Challenges for Young Researchers: Insights from the 2011 PAGSE Symposium

## Organizer

The Partnership Group for Science and Engineering (PAGSE)

## Moderator

Rees Kassen: University Research Chair in Experimental Evolution - University of Ottawa

## Speakers

Hongshen Ma: Professor, Mechanical Engineering - University of British Columbia (UBC)

Madhur Anand: Associate Professor, Environmental Biology - University of Guelph

Steven Cooke: Associate Professor and Canada Research Chair in Fish Ecology and Conversation Physiology - Carleton University

Catherine Beaudry: Associate Professor, Mathematical and Industrial Engineering - Ecole Polytechnique de Montréal

## **Moderator: Rees Kassen**

University Research Chair in Experimental Evolution,  
University of Ottawa

The Partnership Group for Science and Engineering (PAGSE), Kassen explained, runs an annual symposia in Ottawa where young researchers from disparate disciplines come together to discuss visions for the future of science in Canada and abroad. This panel, he said, would focus on how research impact can go beyond one scientific field, impacting the national science agenda as a whole.

## **Hongshen Ma**

Professor, Mechanical Engineering, University of British Columbia

Ma posed two questions: First, what do we mean by “impact”? And, more importantly, how do we properly measure impact?

Ma discussed four ways to think about impact, some with clear standards of measurement, and some that are more open to questions regarding how impact should be measured.



First there is discovery, which increases our understanding of nature. Such knowledge may or may not be useful to us down the road, but is often valuable in itself, as we often simply want to “know the answer” to our questions.

The second kind of impact is workforce training, an area where Canada does a particularly good job. Here we have clear metrics, which may account for our national success in this area. We can ask, for instance, how many people we need to work in a certain sector, then see if supply meets demand.

Third, the impact of research can be seen through the development of technology. Measuring impact in this area is difficult because utilizing research takes time.

The final way to think about impact is in terms of research’s influence on public decisions. Measuring uptake of research, however, is notoriously difficult.

## **Madhur Anand**

Associate Professor, Environmental Biology, Guelph

Anand outlined three major barriers to scientific impact. First, there is a lack of shared understanding at the policy/science interface. Second, scientists face many barriers when conducting interdisciplinary and international research, despite the necessity of such collaboration. Thirdly, science communication and public outreach is formally unrecognized in academic circles, despite being highly valuable from a social perspective.

## Steven Cooke

Associate Professor and Canada Research Chair in Fish Ecology and Conversation Physiology - Carleton University

Cooke discussed some solutions to some of the impact barriers Anand discussed, suggesting that research agendas need to be co-created with policy makers. If collaboration between scientists and policy-makers started at the outset of research it would be built right into the scientific activities that follow.

Cooke also advocated for the creation of more collaborative granting opportunities that bring together natural and social science, along with a stable funding program to facilitate international collaboration. Furthermore, he argued, the culture of training needs to be improved, as there remains a tension between the impetus to engage with the public and balance all other academic responsibilities.

Regarding the tension between collaboration and data-sharing, Cooke suggested that an increase of transparency in research would alleviate this tension. An increase of available data and more scientific debates happening publicly would also improve the impact of research.

## Catherine Beaudry

Associate Professor, Mathematical and Industrial Engineering - Ecole Polytechnique de Montréal

Beaudry stressed that we need to begin valuing researchers for more than citations and publications, placing a greater emphasis on what services a researcher provides to society. Beaudry formulated solutions for measuring research impact that go beyond traditional impact measures, looking at things like the creation of

value through industry collaboration. Instead of measuring the number of graduating students in a certain discipline, she said, a more helpful metric would pay attention to the *career* of these students. Lastly, Beaudry suggested we try to change the incentive structures for academics to recognize the value of researchers contributing in a variety of ways, an institutional change at the university level.

## Discussion

Kassen asked the audience to propose mechanisms to enact the panelists' proposals.

Addressing incentive mechanisms, James Burns (University of Toronto) asked about encouraging researchers to collaborate with policy-makers in formulating research questions. Cooke suggested that incentives need to line up with people's individual motivations such as stable paychecks and good research. Beaudry responded that many granting bodies already facilitate co-creation of research questions, while Anand suggested greater publicity for successful collaborative ventures may be fruitful. An audience member suggested policy-makers could be explicit about their knowledge gaps so researchers can help fill them.

Andy Watson (University of Western Ontario) asked about making researchers more comfortable in communicating details about their work. Anand responded that, depending on the individual, training generally increases the frequency and quality of communication. A dedicated staff member at a university, focused on communications training, might help.

Amanda Cooper (University of Toronto) challenged the panelists to place a greater emphasis on the intermediaries between researchers and their end-users. These intermediaries have well-established networks yet are underutilized by the scientific community.

Krister Shalm (University of Waterloo) pointed out how knowledge transfer to public policy and industry is often seen as harmful to a researcher's career. However, Shalm argued that the amount of funding available for research will increase with better knowledge transfer.

Fred Boyd asked the panelists to discuss how we might facilitate and promote interdisciplinary research. Anand suggested we need better recognized interdisciplinary journals, but Ma put the onus on policy-makers. He argued that correctly formulated problems that need solving will naturally bring relevant disciplines together. Cooke reaffirmed the need for social sciences to accompany natural science in order for research to be successful, and several audience members noted the many successful research programs and granting agencies that are facilitating cooperation and collaboration between researchers and policy-makers.

To conclude, Kassen noted how valuable it is to have a committed group of researchers in Canada looking beyond just having successful careers in their given discipline. These young researchers are interested in making a difference at several different levels, and in many different areas.

# Science, Politics, and Culture

**Keynote - Science and Politics in Canada .....pp.38-41**

Science Culture, Organized and Prioritized .....pp.42-44



# Keynote Panel: Science and Politics in Canada

## Organizer

Canadian Science Policy Centre (CSPC)

## Moderator

Gloria Galloway: Columnist - *The Globe and Mail*

## Speakers

Marc Garneau: Former Astronaut, MP for Westmount Ville-Marie, Quebec

Hélène LeBlanc: Science and Technology Critic, MP for LaSalle-Emard, Quebec

Kellie Leitch: Parliamentary Secretary to the Minister of Human Resources and MP for Simcoe-Grey, Ontario

Reza Moridi: Ontario MPP for Richmond Hill

## Introduction: Gloria Galloway

Columnist, The Globe and Mail

Gloria Galloway opened the panel discussion by stating that although she is a standard reporter, not a science reporter, a working knowledge of science is helpful in almost any branch of journalism today. Politicians, too, should pay attention to science, and Galloway expressed her pleasure at chairing a panel where politicians would, ideally in a non-partisan way, discuss science and politics in Canada. Galloway asked the panel members to introduce themselves, after which she would ask some questions, and then open the floor to further questions.

Reza Moridi, the MPP for Richmond Hill, explained that he was a physicist before entering politics, and that he had worked specifically in the field of radiation safety. Moridi recounted



the broad experience in both academia and industry that he brings to politics, having served as an executive in the electrical industry and as a university professor. His passion for politics, Moridi said, made him run for public office, but he also believes we simply need more scientists in government.

Kelly Leitch, who has worked both as a pediatric orthopedic surgeon at both the Hospital for Sick Children and as an administrator at the Richard Ivey School of Business, brought both a medical and business background to the panel. Leitch explained that she had been interested in public policy for a long time, but

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she entered electoral politics because she was asked to run after her involvement in establishing the Children's Fitness Tax Credit.

Marc Garneau said that while his PhD in electrical engineering did not really qualify him as a scientist, he has worked with scientists his entire professional life, particularly during his time at the space program. Garneau entered politics for several reasons, and he stressed that

he believes it is important to have people in the House of Commons who understand science. However, he continued, he was drawn to politics for more personal reasons as well: ever since he saw Earth from space, Garneau said, he has had a strong concern for the environment. He also believes there is a lot of cynicism about politicians, and said he hopes he can show some people politics is an honourable profession.

Hélène LeBlanc explained that she is a teacher by trade, and she brings her teaching and communication skills with her into politics. LeBlanc worked as an educator in the Museum of Agriculture, but later returned to McGill to get a degree in Animal Science. LeBlanc stressed that politicians need good data in order to make informed decisions, which makes science of the utmost value in policy-making. Furthermore, many issues are multi-faceted, so it is important to get information from all sides. The scientific and political communities, she concluded, need to have an open dialogue.

## Discussion

To begin the discussion, Galloway asked whether the panelists found that there was a large gap between the scientific and political spheres. There is a gap, Moridi answered, but it is perhaps not surprising given that most politicians come from either a social science or a legal background, and as such may simply be unaware of the value of science. Politicians also tend to think on the timescale of elections, whereas a scientific research project may last many times that long, creating yet another disconnect between the two mindsets.

Turning to Leitch, Galloway asked what qualities of science the present government is looking for. The primary thing, Leitch responded, is growing the economy, and science can help do this through new innovation and research ideas. By investing in people, for example through



the Vanier and Banting scholarships, the government is trying to make sure researchers have the tools they need to be successful and get ideas into the marketplace.

Given that scientists as a whole want increased funding for research, Galloway asked, do scientists ever lobby politicians? And further, what is the best way for scientists to approach politicians? Garneau first responded that although he has been approached by many lobbyists, very few of them represented scientists per se. Leitch said that while she has met many health researchers, scientists doing basic re-

search are not often represented. She suggested that perhaps this is because young people are just not taught how government works, and that this should be learned in school. LeBlanc added that while science can be, at first, difficult for politicians to understand, it is important for the scientific community to advise politicians about issues, to raise alarms, and to point out important issues. But if scientists will not go to politicians, she mused, perhaps politicians should go to scientists.

Next, Galloway asked whether politicians ever hear about what scientists are researching and

metaphorically roll their eyes. Every year, after all, taxpayer groups produce lists of crazy-sounding scientific projects to put the government in a bad light. Leitch responded that any such taxpayer complaints would be ill-directed toward the government, since funding decisions are made through the peer-review process.

Garneau agreed that funding decisions are not made by politicians, but clarified that funding organizations are driven by guidelines handed down by politicians. Here, he said, we enter the dangerous territory of deciding whether some science is more important than other science. Garneau conceded that deciding between, for example, a basic research project and a commercializable project can depend primarily on values, but that sometimes politicians need to make such decisions. Building on Garneau's statements, LeBlanc agreed that difficult decisions sometimes need to be made, and this underscores the importance of multiple sources of information.

On the subject of difficult decisions and scientific evidence, Galloway straightforwardly asked the panel whether they had ever been in a situation where they had to ignore scientific advice to meet taxpayer demands. Moridi responded that he had never been in such a situation, but he did worry that politicians can be shortsighted because of the realities of the electoral system. Leitch also said she had never been in such a situation, but she thought that



most politicians' natural inclination to collaborate would help keep it from arising. Garneau responded that it is critical for politicians to first have a crystal clear understanding of scientific facts and evidence, and then make their decision. This decision making is the hard part, he said, and is primarily what politicians are accountable for.

To end the panel, Galloway asked LeBlanc how she would encourage more scientists to

get involved in politics. One step, LeBlanc responded, is public engagement, of the kind the CSPC provides, where politicians can talk to scientists and students. On a policy level, she continued, Canada could consider programs encouraging scientists to enter politics. Moridi agreed that we need more scientists in politics, and that we need a strategy to persuade them to consider politics as a serious option. Garneau hypothesized that most scientists are not drawn toward politics because it involves a very dif-

ferent set of skills and interests from research. Communication skills like succinctness, Leitch proposed, are very helpful in politics, but are generally not taught to scientists. In closing, however, she stressed that these skills can be learned, and that any science students interested in politics should contact their local representatives. Politicians, she said, want your input, and if you are a young scientist with an interest in public policy, your local representative would be happy to educate you about how government works.

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# Science Culture, Organized and Prioritized: Three National and International Initiatives

## Organizer

Canadian Association of Science Centres (CASC) and the Canadian Science Policy Centre (CSPC)

## Moderator

Tracy Ross: Executive Director - Canadian Association of Science Centres (CASC)

## Speakers

Ian Chubb: Chief Scientist - Australian Government

Denise Amyot: President and CEO - Canada Science and Technology Museums Corporation

Lesley Lewis: CEO - Ontario Science Centre

## Moderator: Tracy Ross

Executive Director, Canadian Association of Science Centres

Ross began the panel by describing how Canada's 45 science centres fit into the global network of science centres and science culture, noting several efforts to coordinate and benchmark both national and international science engagement initiatives. Citing a working definition of science culture from a paper by Godin, Gingras and Bourneuf, Ross discussed science culture as the various modes by which an individual, organization, or society appropriates science and technology. Such modes, she said, may differ for individuals or organizations, where individuals learn and seek accreditation while large organizations appropriate technology through the collective R&D system and science communication more broadly.



## Ian Chubb

Chief Scientist, Australian Government

Chubb began by introducing *Inspire Australia*, an effort to create an Australian national strategy for science engagement with the public, the first of its kind. States' rights in Australia had previously obstructed a national effort, but priorities shifted as government reports identified a need for the coordination of existing science awareness activities. With *Inspire Australia*, these objectives have been refocused, calling for more strategic leadership and targeted policy formulation. The program intends to inspire future scientists while building a public case for science funding by the effective communication of science and its uses.

In May of 2011 the Australian government provided \$21 million over three years as a part of *Science for Australia's Future*, which allocates funding based on *Inspire Australia's* intentions. The initiative is being led by Quesacon, Australia's National Science and Technology Centre operating (for these purposes) as a division within the government's Department of Innovation, Industry, Science and Research. Initiatives that target indigenous, second language speakers and disabled people are particularly important under this mandate. A variety of initiatives to this end are employing both traditional and new media to foster pride in Australian scientific achievements. The Prime Minister's science prizes are one such strategy, awarding teachers shown to inspire young students.

Professor Chubb stressed the importance of engagement at urban, regional, and remote scales. The initiative develops a framework around which to base future investment decisions. Success, in Chubb's view, will depend on how well the program is able to build partners and networks, and how well existing activities are aligned across state, federal, and territorial jurisdictions.

### Denise Amyot

President and CEO, Canada Science and Technology Museums Corporation

Amyot described science museums as venues able to transcend silos. Echoing Chubb, she described the importance science plays in everyday life and the importance of scientific education and engagement as justification for paying attention to our "science culture." She gave the example of how the Canada Science and Technology Museums Corporation's recent "energy" exhibit used different components—such as virtual games, traveling exhibitions, websites, Twitter, and information kiosks placed around the country—to reach a large number of people across Canada. This project was accomplished through partnerships with 18 other science centres and art galleries across Canada. With different modes and actors involved, she said, a new dialogue that interests all Canadians can emerge.

Amyot then proposed a five-stage action plan to enhance science culture in Canada. The first stage requires developing a clear slate of indicators, as opposed to traditional proxies like

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number of students and amount of funding. Amyot suggested, amongst other examples, measuring student interest in science careers and comparing these numbers with the number of students who do not end up pursuing such a career (and why) as providing a truer understanding of science engagement with the public. The second stage is to benchmark with other countries and understand their outcomes

and best practices. Third, similar to *Inspire Australia*, a national strategy must be developed and implementable across all jurisdictions. The fourth stage is to foster more gender equity in science, as gender inequality within science in North America has remained relatively constant, even as China and India are achieving equity. The final stage is to develop science leadership in all spheres: those with





backgrounds in science ought to pursue roles at the top of institutions within politics and business.

### **Lesley Lewis**

CEO, Ontario Science Centre

Lewis spoke to international initiatives. At the 2008 Science Centre World Congress, the Toronto Declaration was the first collective statement of belief from their community. The declaration concluded with a series of commitments designed as a framework for inspiration and action, and Lewis explained how the commitments of the Toronto Declaration are being carried out at three scales.

From the level of individual science centres, Lewis described the Ontario Science Centre and the British Council co-hosting a symposium on climate change made up of youth representing Canada, Brazil, the UK, and Russia. The symposium was held within different cen-

tres before live audiences, but was linked and web-casted to other centres.

At a regional level, Asia-Pacific centres were surveyed with regard to progress being made in attaining Millennium Development Goals. This survey showed that 25% of Asian-Pacific respondents addressed gender in their programming, 25% tackled disease, 30% children and health issues, 35% poverty and hunger, 75% maternal well-being, and 90% addressed environmental sustainability.

And globally, science centres world-wide will submit a joint statement to the UN Conference on Sustainable Development in Rio de Janeiro, citing the Toronto Declaration, confirming that science education and engagement platforms can be part of the broader discourse on sustainability.

Lewis ended the discussion by describing two key global initiatives. Ahead of Rio in March 2012, London hosts the *Planet Under Pres-*

*sure: New Knowledge Towards Solutions Conference.* ASTC, the global network of science centres, is their public engagement partner. Engagement with African countries is also a high priority, she said, with the congress's intention of creating at least one science centre in each African country.

# Enabling Private Sector Innovation

Global Implications of Open and Inclusive Innovation .....pp.46-48

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What do some of the fastest growing S&T firms in Canada think about  
Canada's Innovation Policy? .....pp.52-54

The Impact of Investment in Innovation Intermediaries .....pp.55-57

# Global Implications of Open and Inclusive Innovation

## Organizer

International Development Research Centre (IDRC)

## Moderator

Matthew Smith: Program Officer - International Development Research Centre, Canada

## Speakers

Sunil Abraham: Executive Director - Centre for Internet and Society (CIS), India

Jeremy De Beer: Associate Professor, Faculty of Law - University of Ottawa

Pria Chetty: Associate Director, Technology and Innovation Law - PricewaterhouseCoopers, South Africa

## Opening Panel Discussion

Matthew Smith opened one of the most fluid and conversational panel discussions at CSPC 2011 by explaining that the global innovation context is changing, particularly as it applies to information and communications technology (ICT) in the developing world. As internet access and smartphone ownership is growing, innovation in these communities is becoming predicated more on sharing and collaboration than proprietary models and competition. Is this tendency toward open and inclusive innovation a fad, he asked, or are we seeing something truly transformative?

Sunil Abraham responded that, in his opinion, the global innovation shift was dramatic. He demonstrated a new mobile phone manufactured in China, with more features than a Blackberry but at a fraction of the price, as an example of what open innovation is achieving



overseas. Our closed model of innovation, he argued, wherein strict intellectual property (IP) laws limit industrial agility, will never deliver such goods efficiently. It is only by sharing

ideas, perhaps through patent pools or royalty caps, that we can move forward.

Pria Chetty explained that she sees open inno-



vation not as a replacement for traditional modes of innovation, but as a way to accelerate it. In South Africa, innovation has been driven by limited resources, and knowledge is seen as the key to solving local problems. Innovative mobile-phone-based banking systems, for example, help rural citizens manage finances.

As an IP lawyer, Jeremy De Beer noted that while our current policy model uses IP as an incentive to commercialize ideas, open innovation is sometimes portrayed as the idea that all information should be in the public domain. In reality, he said, open innovation is between these two legal extremes. It still requires the legal acquisition of IP, but rather than protecting this IP it is licensed back to the community to require, rather than restrict, sharing. Smith next asked whether open-source thinking is moving beyond ICT. Abraham replied that CSIR, an Indian R&D agency, was currently

running an open-source collaborative drug discovery project. This bold move was motivated by CSIR's recent discovery that their annual expenditures protecting IP amounted to nearly twenty times their income from royalties. Chetty added that the emphasis on collaboration is what makes open innovation a true alternative. When this collaboration includes the end-user, the result can be transformative.

Addressing the subject of inclusive collaboration, Smith asked whether including non-experts in the innovation process could result in a lower quality product. Abraham replied that he saw no connection between openness and quality, as experts too have been known to falsify data. Chetty suggested that, in some cases, the quality products may be less important than why we engage in open innovation; quality may not always be the proper metric. Although open innovation is a wonderful con-

cept, Smith reminded the panel, it takes place in a political economy with unavoidable power asymmetries. Must open and inclusive innovation, he asked, necessarily benefit those in power, and perpetuate these imbalances? De Beer responded that in cases of exploitation, it is not a question of open or closed models, but of equal benefit sharing between all partners. Abraham agreed that openness is not a silver bullet, and when we apply it to achieve empowerment we need to make sure it is configured correctly for the situation at hand.

For his final question, Smith asked what key policy levers enable open innovation space. De Beer responded that metrics are the most important policy lever, since measurement practices determine how stakeholders act. Equating patents with innovation is wrong, for example. This a bad policy that led to aggressive legislation in South Africa requiring specific patent outputs, routinely causing difficulties and delays in innovation-focused research.

## Questions and Further Discussion

The first question from the floor asked what a good metric might be, given that quantity of patents is a bad metric. De Beer responded that metrics should help us understand how people are sharing and using knowledge, so patent licensing data could still be useful. Beyond patents, he suggested, the movement of personnel between research groups, and the number of publications produced, are all indications of

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knowledge transfer. Chetty added that it is important not to apply metrics outside their intended domain. “Good” metrics vary from field to field.

Given the present Canadian context outlined in the Jenkins Report, an audience member wondered how open innovation could affect commercialization. Abraham remarked that an open innovation framework gives a firm more business options than a closed framework, and openness can be a way of reducing research costs. While some early “open” companies did not do well, Abraham suggested that the business community is warming up to the idea.

Another audience member worried that open innovation will only work if the public can engage with it, but information is often presented in a specialized and inaccessible way. Abraham responded that, as with openness and quality, openness and community engagement are in-

dependent. It is not how many people you reach, De Beer said, but who you reach, and the exciting question is whether open innovation can help empower and include economically disadvantaged communities.

Open innovation, De Beer concluded, is not a binary choice between two extremes, but nei-

ther is it a simple continuum. To craft effective policy we need to think about open and inclusive innovation in a much more nuanced way. Chetty agreed, and closed the panel by suggesting that perhaps it is best not to over-define open innovation, allowing all stakeholders to focus on the aspects of it they find the most



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# Funding Innovation, Measuring Societal Impacts, and Informing Science Policy

## Organizer

Canadian Institutes of Health Research (CIHR)

## Moderator

Pierre Therrien: Director, Market Structure and Framework Policy Analysis - Industry Canada

## Speakers

Laura McAuley: Manager, Impact Assessment Unit - Canadian Institutes of Health Research

Kathryn E. Graham: Director, Performance Management - Alberta Innovates, Health Solutions

Ghislaine Tremblay: Director of Evaluation and Outcome Assessment - Canada Foundation for Innovation

Eddy Nason: Director, Toronto Office - Institute on Governance

## Moderator: Pierre Therrien

Director, Market Structure and Framework Policy Analysis, Industry Canada

Moderator Pierre Therrien began by noting that accountability is extremely important in the current context of health funding. Science funding competes with other needs, making evaluation very important.

## Laura McAuley

Manager, Impact Assessment Unit, Canadian Institutes of Health Research

McAuley defined health research impact assessment as “rigorous studies designed to demonstrate the achievement of societal advances through health research.” There are two main types of framework: 1) those that describe processes that lead to impacts, often using logic models; 2) those that focus on the categorization and collection of impacts. The



Canadian Academy of Health Sciences Framework aims to help organizations funding health research determine which model works best for them, recognizing that flexibility allows organizations to tailor their models to specific evaluative needs.

McAuley noted that the iterative nature of science is a major challenge for evaluation. But even with an evaluative model in place, she said, understanding impacts requires moving out of academia into different spheres: from research, through a knowledge translation process, to society at large.



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### Kathryn E. Graham

Director, Performance Management, Alberta Innovates, Health Solutions

Kathryn Graham described the application of assessment frameworks and the use of metrics. The best practice, she said, is to use both qualitative and quantitative indicators, complemented by narrative. Science evaluation typically values outcomes in capacity building, talent and infrastructure, and leveraging resources, for which there are associated metrics. Other outcomes like knowledge advancement, publication, and outreach and public engagement have also been measured.

There is also growing interest in measuring the impact of health research on decision-making, but understanding how research informs policy is challenging. Progress markers are one available tool, which help determine where policy-

makers are actively engaged in a process, and where information was used in policy development.

### Ghislaine Trembley

Director of Evaluation and Outcome Assessment - Canada Foundation for Innovation

Trembley described emerging trends and practices in evaluation work, suggesting the frameworks and metrics described by Graham and McAuley must fit into a larger context to provide better information in a format appropriate for different audiences at different times. Because of changing research practices, typical evaluation has shifted from individual project impacts towards a portfolio approach, an evaluation of a larger group of projects.

With increased demands for accountability, she said, researchers now spend less time conduct-

ing research, and different agencies conduct their own costly evaluations; collaboration can help reduce these burdens. *Consortia Advancing Standards in Research Administration Information (CASRAI)* accesses top quality data for institutions and funders and simplifies the measurement of research impacts.

Quantitative data regarding impact is increasingly desired, especially to measure return on investment. Trembley argued that qualitative measures still add value and depth in this regard. The key is to establish receptive capacity: understanding the limits of evaluation and how policy and evaluation work together in order to find the best approaches.



### Eddy Nason

Director, Toronto Office, Institute on Governance

Nason focused on how governments use assessment instruments, specifically how funds are allocated to universities. In the UK, the *Research Excellence Framework* is an attempt to include impact analysis as part of funding allocation, with 20% of funding now based on research impacts. The Australian *Excellence in Research* program tries to take a measurement

approach to impacts, identifying excellence and using that information to change funding.

Leiden University in the Netherlands was particularly proactive in identifying impacts, developing a framework which calculated \$1.3 billion in value added from the University. Leiden demonstrates the power of impact assessment as an advocacy tool.

At the small organizational level, Nason shared the story of Arthritis Research UK. Since 2000

this group has wanted to know its impacts to advocate for funding. They developed a survey that digests information (outputs and impacts) from meetings with ministers, publications, and changes in policy documents. This analysis gives a broad understanding of the organization's impacts. They later developed the RAND/ARC Impact System, a "DNA fingerprint" of the organization as a whole that can be used to compare themselves to others within the research funding market.

## Discussion

The panelists agreed that improvements have been made in health research impact assessment, though needed improvements will require greater involvement from those being measured and a greater understanding of how data is to be conveyed. A shared value/measurement system and further collaboration will be advantageous to this end.



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# What Do Some of the Fastest Growing S&T Firms in Canada Think about Canada's Innovation Policy?

**Organizer**

Ted Rogers School of Management, Ryerson University (Charles Davis and Jen Hiscock)

**Moderator**

Charles Davis: Professor - Ryerson University's School of Radio and Television Arts

**Speakers**

David Arthurs: President - Hickling Arthurs Low

Curtis VanWalleghem: CEO - Hydrostor Inc.

Nicolas Morgan: Vice President, Business Development - Morgan Solar

## David Arthurs

President, Hickling Arthurs Low

David Arthurs began the panel with a discussion of Canada's innovation support landscape, using the classic definition of innovation as "bringing new products to market." Unfortunately, Arthurs argued, Canada has no unified innovation policy or single point of governmental support. Instead, support is delivered by a number of organizations, many of which have contradictory objectives and overlapping initiatives. This makes the support landscape confusing, and, due to this complexity, many firms are completely unaware of supports for which they are eligible.

Arthurs considered the implications for this complex regulatory landscape at the firm level. He stressed that regulations are critical, and



must not be seen as universally bad: while regulations in some industries have relatively little effect, in others, like clean energy, they can actually drive innovation. In terms of regulatory changes, Arthurs first suggested that Canada needs to do more to encourage entrepreneurs. The entrepreneurial spirit cannot be taught, he argued, but it can be fostered. Failure, too, is a natural part of entrepreneurship, and the government needs to recognize this and make sure failure is possible. We should also be wary, Arthurs cautioned, of using regulations to spread industries too thinly across the country. While all regions should be devel-

oped and none should be neglected, allowing local clusters of expertise to grow will foster diverse cultures of innovation and success.

## Curtis VanWalleghem

CEO, Hydrostor Inc.

Building on David Arthurs' talk, Curtis VanWalleghem specifically addressed the challenges facing innovative entrepreneurs. Many people would like to be entrepreneurs, VanWalleghem said, but the financial risk of failure is too great. One way to minimize this risk

is for large employers to offer entrepreneurial employees a leave of absence, with benefits included, and the promise of renewed employment if their enterprise does not work out. Once a firm is started, VanWalleghem continued, it needs a first sale. This is better than any grant, and having governments purchase from local start-ups would help ensure their success.

VanWalleghem closed by discussing some challenges facing entrepreneurs that could be addressed by future regulations. Global partnerships, for example, are very important, but it can be difficult to tap into existing networks. Intellectual property (IP) is also a stumbling block for young companies. Protecting IP is necessary, but multinationals have much deeper pockets than small firms, which makes it difficult to compete on an equal footing. If there were a more streamlined way of dealing with IP, VanWalleghem suggested, IP could help small businesses rather than hurt them.

## Nicholas Morgan

Vice President, Business Development, Morgan Solar

Glen Martin brought an American entrepreneurial perspective to the panel. The US has a number of vibrant clean technology ecosystems with strong entrepreneurial cultures, and a number of people are looking to develop similar projects in Canada. On the one hand, Martin sees Canada as a land of opportunity for renewable energy technology, particularly in light of Ontario's Green Energy Act. On the other hand, this opportunity has been difficult to seize. One major obstacle has been the lack of local venture groups willing to invest in clean technology. Project financing is a particular challenge for small companies, which can not provide the same performance guarantees as large multinationals. Martin recounted one example where a firm had proven technology, but Canadian banks were too risk averse to invest in the project. The firm instead



got financing from German banks, and hired a German manufacturer, representing a missed opportunity for Canada's clean technology sector. Only if financiers have a familiarity with the technology and the ability to move quickly, according to Martin, can we help prevent this in the future.







fluence, particularly in Northern communities at the end of the supply chain.

Sandra Greer, President and CEO of AMIRIX, asked whether failed enterprises could have valuable input on pitfalls in current policies, and suggestions for new policies to encourage more success. Failure teaches lessons, Martin agreed, but some companies should fail. VanWalleghem agreed, suggesting that some good technologies do not succeed because the business is run by technologists and not entrepreneurs. Policies to encourage entrepreneurial thinking, such as corporate leave of absence programs, might help potential entrepreneurs take the leap to partner with technologists.

Jen Hiscock asked about the role of incubators in entrepreneurship. Incubators offer invaluable networking opportunities, VanWalleghem replied, but care must be taken to keep them from becoming overly bureaucratic. In Martin's view, incubators serve as excellent places for established firms to shop for talent.

## Question Period

Charles Davis asked everyone to diagnose the Ontario clean energy ecosystem and provide some recommendations. Martin and VanWalleghem both agreed that the Ontario cleantech ecosystem is nascent with great potential, with Martin stressing the need for an entrepreneurial culture and easy financing, and VanWalleghem emphasizing that care must be taken to build an ecosystem. Arthurs cautioned that Canada needs more innovation support, to ensure that

our firms compete together on the global stage instead of infighting with each other.

One question asked how local demand could be improved to foster company growth. VanWalleghem suggested that governmental procurement policies could help mitigate the risk of local investments; Martin added that while municipalities do not have the purchasing power of provincial or federal governments, community-level demand can have a huge in-

# The Impact of Investments on Innovation Intermediaries

## Organizer

Telfer School of Management, University of Ottawa (Margaret Dalziel)

## Moderator

Nobina Robinson: CEO - Polytechnics Canada

## Speakers

Mario Thomas: Senior Vice President - Ontario Centres of Excellence

Margaret Dalziel: Associate Professor, School of Management - University of Ottawa and Vice President Research - The Evidence Network

Raine Hermans: Head, Unit for Strategic Intelligence - Tekes (Finland)

Natalie E. Dakers: CEO - Centre for Drug Research and Development

NOTE: Technical difficulties have limited our ability to provide coverage of this panel. Our apologies for any inconvenience. Special thanks to Conrad McCallum of the Telfer School of Management for his assistance in preparing this coverage.

Governments and businesses around the world invest in innovation intermediaries that help a diverse range of firms of different ages, sizes, and endowments innovate and succeed. Heightened concern for transparency and accountability has meant that these enabling organizations and programs report on a range of metrics, possibly including their impact on client and member firms. This panel explored the state of the art of innovation intermediary impact assessment, from a range of perspectives:



Canadian and European, practitioner and academic, ICT and biopharmaceutical industries. Panel members considered what is proven, possible, desirable, and rightly avoided in terms of impact assessment methodologies. They also considered the degree to which different constituencies seek, avoid, are provided with, ignore, and use assessments of interme-

diary impact. The overall objective was to articulate an improved understanding of what works and does not work in impact assessment for innovation intermediaries, an issue that is central to the purpose of intermediaries and their ability to contribute to the innovation systems of which they are a part.

## Margaret Dalziel

Associate Professor, School of Management, University of Ottawa and Vice President Research, The Evidence Network

Dalziel noted that researchers have been examining the economic and social impact of innovation intermediaries such as R&D tax credits, science parks, industry associations, and the US Small Business Innovation Research (SBIR) program, for years. An assessment of an intermediary's impact may be positive, negative, or not significant depending on several factors including the purpose and design of studies, the researchers' assumptions, and the statistical methodology used. For example, one decade long study of SBIR discovered there was a positive impact on revenues, employment, and venture capital financing, but another study found no impact on employment or investment in R&D. Similarly, researchers have produced differing assessments of the impact of science parks and industry associations. In the 1990s, studies of a large U.S. R&D Consortium revealed positive impacts on generic technology generation and industry infrastructure, but negative impacts on private sector R&D spending.

There are several reasons, Dalziel said, that explain why measuring the impact of innovation intermediaries is difficult: firstly and most obviously, intermediaries and their firms are highly varied, making cross-comparison complex and difficult at a very basic level. Secondly, there is always a time lag between engagement with the intermediary and firm outcomes, making it difficult to conduct a com-



prehensive and informative study that links the work of intermediaries with the output of their firms. And thirdly, it is generally hard to distinguish between selection effects and treatment effects; that is to say, when studying the effectiveness of a particular intermediary whose firms perform highly, it is often unclear whether a) engagement with that intermediary leads to high firm performance or b) that intermediary only engages with firms that perform highly. If data on firm performance is used to measure an innovation intermediary's impact, one has to control for other factors that affect firm performance. Additionally, an intermediary's activities will affect firm resources and capabilities, but data on these aspects of intermediary work is hard to come by.

Despite these challenges, Dalziel said, researchers are working to improve impact assessment and the state of the art in developing more reliable, relevant, and actionable metrics is evolving. She emphasized that measuring what is relevant, not what is convenient, will be important in improving assessments. Assessments should use firm-level data, consider

multiple dimensions of impact, and leverage the ability of executives to judge whether or not the intermediary contributed to a specific outcome. She also cautioned that measuring performance should not detract from achieving performance, underlining the need to be efficient in measuring impact.

## Mario Thomas

Senior Vice President, Ontario Centres of Excellence

Speaking about techniques for measuring success, Thomas began by stating that there always needs to be a strong link between mission, metrics, and incentives. You need to be clear about your mission and tailor your metrics accordingly, he said, because only then can you provide proper incentives that will change behaviour toward achieving the objectives and meeting the targets.

With regards to the clarity of one's mission, Thomas stressed that proper success metrics will always depend on your goals. France's TTOs, for example, are using Technology Readiness Levels to assess their programs. Singapore, by contrast, has created incentives for universities and intermediaries receiving government funding to attract value-added investment into the country. In contrast to both France and Singapore, Nordic Innovation aims to facilitate cooperation among the five Nordic countries and between industry and academia, with universities using the size of grants or contracts to measure success, and companies



tracking the people skills and competence they attract (in addition to revenue).

Mission clarity forces an organization to think about how its activities add value. Achieving such clarity, Thomas said, will generally require thinking through the value chain and seeing where your organization fits. Only then can you set measures and incentives that lead to real organizational behaviour change that will facilitate and support commercialization.

As it stands, however, measurement of success remains challenging when assessing intermediaries individually. Many organizations work collectively, so there is no clear framework on how to measure the impact of one without measuring the impact of all. Accordingly, stakeholders should determine which metrics they want, and assess for themselves whether or not such metrics are useful.

Businesses usually use the most straightforward metrics, involving talent attraction, skill development, and revenue, but public sector metrics can often be problematic, especially when goals are vague or unrealistic. Useful and meaningful metrics for intermediaries are often characterized in terms of leveraged investment from the private sector.

Thomas cautioned that “job creation” is not really a useful metric for any organization, though is important for governments. Revenue growth, number of products that reach the

market, and other wealth creation measures such as amount of tax revenue generated are the much more useful, and often serve as the most important metrics.

With regards to incentivizing positive change in commercialization strategies, Thomas said that intermediaries are at an advantage in serving companies in their region, because universities typically have no incentives for commercialization. Very large government funding for university research provides a strong incentive to focus on research and to leave commercialization to others. Intermediaries can speed up commercialization by incentivizing it within the universities and then tracking the results.

But in this complex environment, Thomas concluded, a tension remains around the use of impact versus activity metrics. Intermediaries with economic development goals and investors want to develop impact measures so they can quantify their returns, but many government funders prefer to measure success in terms of moving ideas towards proof of concept, without measuring economic and social impact. To provide effective incentives for increased commercialization, intermediaries must be clear about their definitions, what goals they serve, where they fit, and (perhaps most importantly) they must communicate all of this to stakeholders and funders.





# International Year of Chemistry

Plenary - Drivers of Innovation in the Chemical-Related Industry Sector.....pp.59-61

# Drivers of Innovation in the Chemical-Related Industry Sector

## Organizer

Chemical Institute of Canada (CIC)

## Moderator

Bernard West: President - Westworks Consulting and Chair of the Board - Ontario BioAuto Council

## Speakers

Avrim Lazar: President and CEO - Forest Products Association of Canada

Craig Crawford: President and CEO - Ontario BioAuto Council

David Yake: Director, Corporate Process Innovation, Research and Business Development - DuPont Canada

Dave Collyer: President and CEO - Canadian Association of Petroleum Producers

## Moderator: Bernard West

President, Westworks Consulting and Chair of the Board, Ontario BioAuto Council

Noting that 2011 was designated by the UN as the “International Year of Chemistry,” West began by discussing various chemistry-related public outreach programs before introducing the panelists and the idea of the chemical-related industry as a driver of innovation

## Avrim Lazar

President and CEO, Forest Products Association of Canada

Avrim Lazar opened by explaining that chemistry has become increasingly important in forestry. In traditional forestry, a tree is harvested and cut into boards, and any left-over chips are pulped and made into paper. The problem with this business model is that the barriers to entry are low, so it is difficult to find much profit.



One solution is to add value by building and selling wooden goods, rather than just raw materials, but the high relative price of Canadian labour makes it difficult to compete internationally.

The real solution, Lazar said, has been for the forestry industry to innovate entirely new ways of making money from wood. Researchers from the private sector, academia, and government that were formerly isolated from each other were brought together to work on co-

ordinated projects. The results have been stunning: biorefineries are now investigating ways to extract combustible hydrocarbons from wood, new wood-based nano-fibre materials are being developed, and a new economic opportunity has been offered to 200 rural communities. The two lessons of this case, Lazar emphasized, are that opportunity comes from walking out of silos and entering new systems, and that innovative research and development is driven by the capacity to make money.

## Craig Crawford

President and CEO, Ontario BioAuto Council

Craig Crawford argued that economic competitiveness and innovation require more than just taking ideas from the science lab to industry. A small new chemical company named BioAmber, for instance, began by acquiring intellectual property (IP) from an American company and moving to France to take advantage of its thriving, billion-dollar bio-cluster. They used this cluster's resources to scale up their production, but after a development period, the company left France and landed in Sarnia after considering over one hundred North American jurisdictions.

Crawford cited several reasons BioAmber was attracted to Sarnia: strong transportation logistics, a good tax structure, and aggressive local private-sector leadership. The point, he stressed, is that the practice of science is embedded in other factors, and federal policy should take a whole-picture approach to developing competitive sectors.

## David Yake

Director, Corporate Process Innovation, Research and Business Development, DuPont Canada

DuPont, David Yake reminded the audience, is a science-based company with a large number of research employees in Canada. Research at DuPont starts with the customer, and the size of the local market opportunity helps to deter-

mine where research gets done. The Canadian government has incentive systems to attract new research and investment, but government incentives alone will not bring research to a community. Instead, Yake argued, business and value considerations drive research. DuPont views R&D as an investment, and if the investments are profitable, they will continue.

Yake emphasized that the role of government policy should not be to pick winners and losers, but to encourage innovation and investment. Canada is under-investing compared to other countries, and Yake argued that industries should, with government as an enabler, be investing more in R&D. DuPont is a good role model, he suggested, and it will continue to invest in Canada because it sees a large market opportunity.

Yake closed with two comments specifically on Canadian R&D policy. First, he said, the SR&ED program is very important, and allows DuPont to compete globally. Second, DuPont would like to see a more streamlined process with less government paperwork, since in some cases a market opportunity can be gone by the time the paperwork is finally finished.

## Dave Collyer

President and CEO, Canadian Association of Petroleum Producers

Dave Collyer's presentation focused on the drivers and barriers of innovation in the Cana-

dian oil and gas sector. The oil and gas sector is the largest investor in Canada, he said, and there are several reasons why innovation is essential to the industry. First, although Canada has abundant natural resources, we need more cost-effective methods of extraction, and new technologies can help drive costs down. Second, new technologies can give more value-added opportunities, and improve environmental and social performance. Any innovations developed in Canada are also, he reminded the audience, good export opportunities.

Collyer then discussed some barriers to innovation in industry. First, he argued, the way we measure and report on innovation is unsatisfactory, meaning that we often do not understand what the trends are. Second, while Collyer agreed with Yake that the SR&ED system is very useful, he argued that its eligibility criteria are much too narrow. He criticized the Jenkins Report on this note, calling it a missed opportunity for suggesting substantive change. Third, Collyer suggested that industry needs to collaborate more, to better compete in a globalized world. In the end, however, Collyer stressed that he is an optimist: Canada has a good innovation track record and a good foundation to build on, so if we continue to invest in technology and innovation, we can be a global leader.

## Discussion

West initiated the discussion by asking the panelists how policy could be changed to ad-



dress industry's needs. Lazar argued that we need sensible industrial strategies focussed on profits, but we should be ready to admit when and if these strategies fail. Collyer disagreed, saying he is not a fan of top-down industrial strategy, suggesting that government would best act as an enabler to bring groups together. Yake and Crawford agreed that an undue

amount of emphasis is put on small- and medium-sized enterprises (SMEs) at the expense of multinational corporations, and this can be seen, for example, in the Jenkins Report. The relation between SMEs and bigger companies is organic, Lazar continued, and for an ecosystem to be healthy, all its components must be healthy too.

Michael Bourque, from the Chemistry Industry Association, asked for clarification about what kinds of strategies the panelists would like to see. Collyer responded that an energy strategy, not necessarily dictated top-down by the federal government, would help align domestic research and send clear signals to other countries about our priorities. Lazar noted that while the government is de facto involved in strategic decisions, it is reluctant to articulate a coherent strategy. So, he said, he would most like to see real strategic reflection.

Another audience member asked if the panelists had thoughts on open innovation. Yake responded that open innovation is a necessity, as the cost of product commercialization is often too high for one firm to bear. Collyer mused that in some cases industry could be better served by simply sharing IP, providing a competitive advantage to the industry as a whole. Yake cautioned that this approach would have to depend on industry-specific notions of competitive edge. In resource-based industries your competitive edge is the land you own, so sharing IP may be beneficial; if you are a research company then your IP is your competitive edge, and development requires a return. Crawford added that we should scour the world for IP, and then quickly acquire it and drive investment into Ontario. By being early adopters we can exploit the investments of others who are slow to commercialize.



# Exploring the True North: Reflections on Northern Science Policy

Arctic and Northern Science Policy and International Diplomacy.....pp.63-65

Using Science Policy to Improve Health Outcomes in the North.....pp.66-68

How Do We Build Resilient Communities in the Face of Climate Change? .....pp.69-70

# Arctic and Northern Science Policy and International Diplomacy

## Organizer

Canadian Science Policy Centre

## Moderator

Anita Dey Nuttall: Associate Director, Research Advancement - Canadian Circumpolar Institute, University of Alberta

## Speakers

David Hik: Professor - University of Alberta and President - International Arctic Science Committee

Stephanie Meakin: Science Advisor - Inuit Circumpolar Council (ICC), Canada

Russel Shearer: Chair, Arctic Monitoring and Assessment Program (AMAP) - Arctic Council and Director, Northern Science and Contaminants Research Directorate, Aboriginal Affairs and Northern Development Canada (AANDC)

Roberta Burns: US Arctic Officer, US State Department

## Moderator: Anita Dey Nuttall

Associate Director, Research Advancement, Canadian Circumpolar Institute, University of Alberta

Dey Nuttall began by discussing how Canada has asserted a Northern identity, and its implications for international diplomacy. The Northern Strategy—a federal government statement on Canada’s Arctic and Northern policy—along with military exercises in the North and plans for a new Canadian High Arctic Research Station (CHARS) demonstrate the importance currently being placed on Canada’s Northern and Arctic regions. Many other nations—including some non-Arctic states—have shown a growing interest in Arctic research, so Canada’s attitude towards the North needs to be seen in the context of non-Arctic national interests, as well.

## David Hik

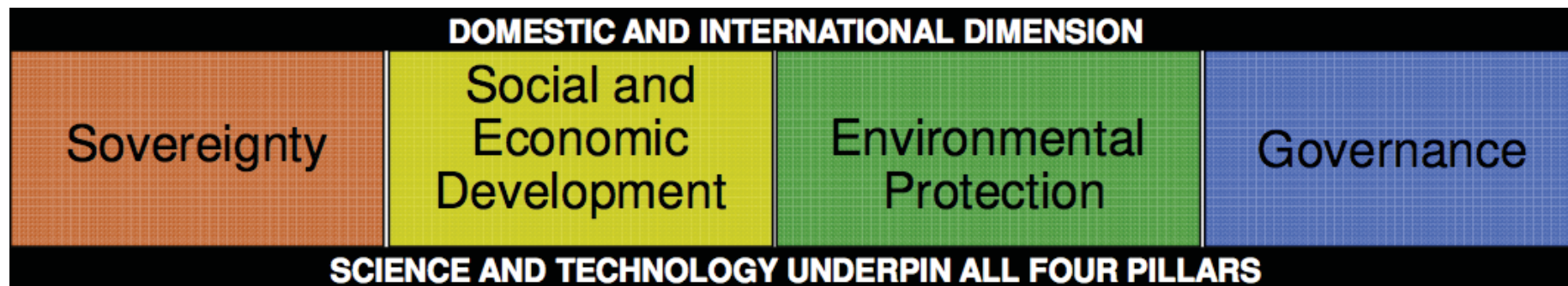
Professor, University of Alberta and President, International Arctic Science Committee



Hik spoke about his time as executive director of the Canadian International Polar Year (IPY) Secretariat, an international collaborative research effort aimed at helping scientists better study the Arctic and Antarctic. The research and infrastructure outcomes from the IPY, he said, allows us to address important societal issues such as climate change, the health of Northerners, and the impact of resource development. Accordingly, the Government of Canada has made its “Northern strategy” a priority,

investing in Arctic infrastructure such as ice-breakers, research stations, satellites, and other support. The idea behind these efforts is, in part, to develop a world-class Canadian research capacity in the North, as all four “pillars” of the strategy—sovereignty, social and economic development, environmental protection, and governance—are underpinned by science and technology.

## The Government of Canada's "Four Pillared" Northern Strategy



But we need international partnership to make Northern research work, he said, adding that polar research is important for many nations. Indeed, many coastal but non-Arctic nations (such as Malaysia and India) make eager contributions to excellent polar research, as changes in ice sheets will drastically affect their coastlines. We must lead Arctic research efforts, but should also actively collaborate and cooperate with other nations when it comes to scientific research at the poles, he said. Environmental changes in the Arctic are happening now, and they are happening rapidly, so strong international research partnerships need to be developed immediately.

### Stephanie Meakin

Science Advisor, Inuit Circumpolar Council, Canada

Meakin discussed the role of indigenous organizations and communities in influencing the direction and scope of Arctic science. The Inuit Circumpolar Council (ICC) involves Inuit from four countries coming together in recognition of their shared history and knowledge of the



North. Ensuring that Inuit knowledge plays an active role in research and policy development on the regional, national, and international levels is often difficult, however, as there are less than 200,000 Inuit, and their traditional knowledge is often not recognized as "science" proper. While not "science," she said, traditional knowledge is extremely important for understanding everything from global climate change, to changing transportation routes in the North, to resource development. Scientific researchers in the North need Inuit knowledge.

In terms of Inuit needs, the ICC recently issued a call on global leaders that asked for five things: recognition of the Arctic's role in sustaining global climate systems and supporting human life on Earth; support for the integration of indigenous knowledge with global environmental assessments; support for indigenous peoples with adaptation and sustainable technologies development; respect for the human right to a healthy environment, and the rights of indigenous people to free, prior, and informed consent; and recognition of the Arctic Council as a model for cooperation between states and indigenous populations. Meeting these requests would make for better polar science.

### Russel Shearer

Chair, Arctic Monitoring and Assessment Program (AMAP), Arctic Council

Shearer focused on science and policy integration within the Arctic Council, an international forum that brings in both state representatives and indigenous organizations. As chair of the Arctic Monitoring and Assessment Program

(AMAP) for the Arctic Council, Shearer has seen research effectively influence global environmental policy.

After providing several examples of the excellent and important research being done in Arctic monitoring by AMAP, he finished by extolling the virtues of CHARS, the new research station being developed in Cambridge Bay, Nunavut in terms of its ability to link local, regional, national, and international S&T. CHARS will be open year-round, solution-driven, and a highly collaborative partnership.

### Roberta Burns

US Arctic Officer, US Department of State

Roberta Burns discussed the nature of the Arctic Council and its role in generating science in the North, and also responding to that science. The Arctic Council, she explained, does not have the right to speak on behalf of members or enforce binding agreements like the UN; it is a forum, not an organization. This format helps generate good science, for it allows different voices and practices to be present together at one table, even those with conflicting perspectives. The ICC, for instance, is an indigenous group that sits right alongside state representatives, even though their interests often conflict with the positions taken by the countries where they live. Science moves through the council both from the bottom-up—from working-groups like AMAP who explain the policy-relevance of science to policy-makers—and from the top-down—from

“policy wonks” who are able to drive science by holding scientists to deadlines and research agendas. Legally binding agreements around search and rescue have recently been negotiated through the Arctic Council, proving that the Arctic Council does have the potential for capacity building in the North.

Burns finished by emphasizing that Arctic policy is perhaps the most important and intersectional policy issue around today, involving health, sovereignty, development, great science, and the conflict between science and traditional forms of knowledge. “This is the Arctic’s moment,” she said, encouraging the audience to become a part of science and policy in the North.

### Discussion

Paul Labbé from Defense Research and Development Canada discussed a possible solution to Northern contamination—emissions recycling to generate biofuels—but questioned our ability to determine where Arctic pollutants come from. Shearer assured him that the reports he discussed accounted for the regional aspects of anthropogenic Arctic contamination, and that identifying the regional sources of contamination is entirely possible.

Debbie Lawes, a writer and editor for Research Money, asked about our research funding failures in Canada. Hik explained that things have improved, but that heavy investment is absolutely necessary in the North to implement our national strategy, and meet our international

monitoring obligations. Even after capacity is built in the North, he said, it must be sustained by some sort of long-term research program providing, at minimum, sufficient resources for core operating and baseline monitoring.

Much of the discussion focused on environmental and health issues in the North, including the role (if any) of economic considerations in the inherently fragile Arctic. Specifics about communications issues in the North were also discussed, as well as the political differences between research conducted in the Northern and Southern polar regions.

Dey Nuttall closed by asking the panel whether the lack of a firm, national science policy acted as a barrier to effective research in the North. Hik explained that Canada’s Northern Strategy was not exactly a piece of science policy, but that if a Northern science policy helped national and international cooperation proceed more effectively, he would approve of it. Shearer agreed that clarity is helpful, but said that a major component of the Northern Strategy is science, so what researchers really need to do is just commit to effectively working together, internationally and nationally. Burns reminded the panel that one of the benefits of clear policy initiatives is that it allows researchers and policy-makers to lean on government commitments to garner funding and support, some-thing that is especially important in the Arctic.



# Using Science Policy to Improve Health Outcomes in the North

## Organizer

Health Canada

## Moderator

Sandra Lister: Manager, Science Policy Coordination - Health Canada

## Speakers

Christopher Cornish: Regional Director, Policy, Planning, and Evaluation - Health Canada, Northern Region

Kue Young: Professor, Dalla Lana School of Public Health - University of Toronto

Pertice Moffitt: Nurse Educator - Aurora College

Sarah Halhok Bourque: Manager, Northern Science and Contaminants Research - Aboriginal Affairs and North Development Canada

## Moderator: Sandra Lister

Manager, Science Policy Coordination, Health Canada

The objectives of this session, Lister said, were threefold: to raise awareness about health challenges in the North; to show how building up science presence will improve health outcomes in the North; and to reiterate that science must be a collaborative effort, reaffirming the need for government, communities, and universities to all work together in doing science.

## Christopher Cornish

Regional Director, Policy, Planning, and Evaluation  
Health Canada - Northern Region

Cornish set the context for the ensuing discussion by giving an overview of residents' health status in the North, the Government of Canada's research and health priorities there. He then began by discussing how we define "the North," noting that we need to remember that the Northern parts of the provinces face some of the same challenges as the territories. Depending on where you live in the North—in a



rural or urban area—your health outcomes will be very different, with residents in urban centres having easier access to health resources. There is also a major difference in terms of health outcome between indigenous and non-indigenous populations, with indigenous populations having much lower health outcomes. The main factor influencing health outcomes, however, is income inequality.

To put things in perspective, Cornish noted that PEI has more people than the North, but even if faces challenges in meeting its residents' health needs without transfers from Ottawa. The expansive nature of the North makes it even more difficult to provide for Northerners,

given expenses like travel and heating—sometimes people describe Northern healthcare as medical travel system, not a healthcare system, he joked. It is also challenging to attract and retain healthcare professionals to live and work in the North.

The North is very much in a period of change and transition, he said, in terms of culture, demographics, diet, mental health and addiction, and the legacy of residential schools. Economic changes are also occurring in the North, and we must remember that there are both positive and negative outcomes to increasing economic activity. There are also environmental changes rapidly occurring; in the

North, he said, climate change is not at all theoretical.

A lot of these changes are “coming to” the North, as they result from global changes and Northerners themselves have little power to affect them. But the good news is that there is increased core capacity being built up in the North, renewed self-governance and autonomy (Nunavut being a case in point), a newly established middle class, and the introduction of effective health practices (such as telemedicine).

Addressing the “keys for success,” one of the most important things recently learned about providing health care in the North is that the old model—where outsiders go in and study and prescribe for the North—does not work. Partnerships and relationships really matter. We need to recognize that there are different lines of evidence, and that different groups—researchers, citizens, policy-makers—need different things. Ottawa is very far removed from the North, but that is not to say it does not have a role to play. Rather, there needs to be a better balance between community-based research and the needs of service providers in the North, and the government’s evidence needs as a partner, enabler, and funder of improved health outcomes in the North.

Cornish finished by discussing successful science policy programs in the North, such as the First Nations and Inuit Climate Change Adaptation program. Here the government’s role is to enable and fund communities to define their research needs, so they can define their own

adaptation needs rather than having them defined in Ottawa.

### **Kue Young**

Professor, Dalla Lana School of Public Health, University of Toronto

The focus of Young’s presentation was the sustainability of healthcare in the North. He began by reiterating the substantial disparities between Northerners and everyone else in Canada in terms of health outcomes, noting a strange fact: the health outcomes of non-aboriginals in the North are actually better than the health outcomes of people in the rest of Canada, a fact he hypothesized resulted from the fact that most non-aboriginals living in the North moved there with very well-paying jobs. But are we getting value for our money in terms of healthcare in Northern Canada, he asked, and is it sustainable? Most importantly, how can we improve these outcomes?

Comparing data and approaches from several different Northern countries, Young discussed various approaches to health in different Northern regions. Because there are similar populations living in very different jurisdictions (Inuit, for example, live in four different countries: Canada, USA, Russia, and Greenland), we have case studies to compare the effectiveness of different national health policies. Russia, for instance, has low health expenditure and predictably low health outcomes. Alaska, in contrast to all the other Northern regions, has a strictly parallel system of healthcare: one for the indigenous populations and another for the non-indigenous. In Greenland

there are small hospitals that operate in many communities, whereas Canada uses a nurse-based approach with central hospitals.

Young finished by extolling the virtues of technological innovation in Northern healthcare. Lister then asked about the Northern viability of strategies found valuable in developing Southern countries. Young responded that many Southern countries have used cellular networks in innovative ways to ensure that medical supplies remain well-stocked, and that something like that might work in the North. Moffitt cautioned that Northern infrastructure is different, citing an example of a satellite malfunction that prevented the use of ATMs.

### **Pertice Moffitt**

Nurse Educator, Aurora College

Moffitt spoke to health disparities, capacity building, and policy direction in the North. The promise of capacity building has been touted as a means of eliminating health disparities in the North, and while there is hope that this will prove accurate, the evidence is not exactly there yet. Currently we have far more questions than answers.

First, “Does the definition of health disparity make a difference to science policy?” When starting a study, she said, it is even difficult to decide what to count as rural. In Southern regions, a community of 20,000 might be counted as rural, but that is actually the entire population of Yellowknife. Well-informed and consistent definitions are very important. Another important question is “How do we define

‘capacity building’?” Condell and Begley (2007), for instance, define it as “a funded, dynamic intervention, operationalized through a range of foci and levels, to augment ability to achieve objectives in a research field over the long term, with aspects of social change as an ultimate outcome.” But, Moffitt said, many capacity building projects have proceeded under very different definitions, and various other definitions have been provided, which we must keep in mind.

Her main recommendation was for an “integrated” systems approach to capacity building in the North, as much of the waste in health research and provision results from a lack of coordination. The training of nurse practitioners in local contexts, for instance, was first envisioned as a way of getting local people to help improve their own health. The success of such programs, she said, is very important, as one of the biggest problems is the turnover seen amongst healthcare practitioners. In the process, however, we need to bring in decolonization considerations, as the territories are

still very colonial in terms of their relation to Ottawa and the territorial governments. In order to be successful, health and research agendas must be defined by Northerners, and capacity needs to be made up of trained, dedicated Northerners.

### **Sarah Kalhok Bourque**

Manager, Northern Science and Contaminants Research, Aboriginal Affairs and Northern Development Canada

Bourque spoke mainly of using science in policy, rather than developing policy for science. She addressed the policy environment in which several Northern programs developed, specifically the Northern Contaminants Program (NCP) and the International Polar Year (IPY). Both of these programs focused, at least in part, on health outcomes in the North, within the context of environmental factors.

Bourque began by discussing food issues in the North. In Nunavut the level of food insecurity is about seven times higher than in Southern Canada. This is because of a number of regional factors including income, remoteness, dietary changes, and environmental contamina-

tion. While traditional, “country” foods are generally quite healthy, they are now the primary sources of various contaminants such as heavy metals, persistent organic pollutants, and other chemicals that have collected in the Northern regions. So, while traditional wisdom held that country foods should be consumed regularly, for both health and food security reasons, it is no longer clear what a healthy diet means in the North.

The NCP is a national program that aims to identify and reduce contaminants in traditionally harvested foods, and to increase awareness of contaminants so that Northerners can make informed food choices. Such research has helped to reduce contaminant levels in the North by informing national and international environmental policy, even allowing certain food bans to be lifted once contaminant levels dropped.

Bourque went on to describe the Inuit Health Survey, carried out primarily by the IPY and ArcticNet, that addressed everything from housing density and diet to heart and bone health. Both bad and good news came out of this study, and while these results have not yet been taken up by policy, Bourque said that they soon will be, and that pre-published information is already being used by territorial nutritionists for health decision making and priority setting for nutritional health interventions.

Looking ahead, she said, we need to build upon the health successes achieved in the North, and increase information sharing and collaboration.

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# How Do We Build Resilient Communities in the Face of Climate Change?

## Organizer

Canadian Federation for the Humanities and Social Sciences (CFHSS)

## Moderator

James Baxter: Founding Editor and Publisher - iPolitics

## Speakers

Frances Abele: Academic Director - Carleton Centre for Community Innovation and Professor - Public Policy and Administration, Carleton University

Gordon McBean: Research Chair - Institute of Catastrophic Loss Reduction and Professor - Geography and Political Science, University of Western Ontario

Ian Mauro: Canada Research Chair in Human Dimensions of Environmental Change - Mount Allison University

Jamal Shirley: Manager, Research Design and Policy Development - Iqaluit Research Centre, Nunavut Research Institute

## Moderator: James Baxter

Founding Editor and Publisher, iPolitics

This panel, Baxter explained, would be oriented around three specific questions, with each panelist addressing each question before moving on to the next question.

### Question 1: “What strategies are available to Northern communities to mitigate climate change and its impact on ecosystems?”

Gordon McBean began by acknowledging that most of the literature on adaptation has a “Southern focus,” referencing the IPCC, Natural Resources Canada, and even the Institute of Catastrophic Loss Reduction that he is affiliated with. A multi-disciplinary approach that can integrate mainstream climate science into codes and planning frameworks is required in Northern communities. Ian Mauro distin-



guished mitigation and adaptation. Northern communities must adapt more than the South, as warming in the Arctic is 1.5 – 4.5 times the global average, but mitigation is the role of the global South. Jamal Shirley added that the diversity of the North’s geography made things even more complicated, stressing the importance of community members’ participation within this process. Frances Abele argued more

attention must be paid to strengthening institutional capacity at local, regional and territorial levels, noting that Northern hamlets have difficulty even garnering sufficient resources for local hearings on development projects. The Baffin Environment Community Empowerment Network (BECON) is an initiative to develop a digital network of Northern communities and operates “at the pace and the level of



the hamlets in the North Baffin.” This type of initiative, argues Abele, must be complemented in the North by improved non-governmental institutions.

**Question 2: “Are there government and policy hurdles hindering the development and implementation of these strategies?”**

Shirley discussed the International Polar Year “Community Adaptation and Vulnerability Case Studies,” which identified a lack of financial resources as the biggest impediment to community-level adaptation. In Nunavut, funds are often allocated to other social problems, as the territory’s health services have the highest cost per capita in the world. Every five years a Territorial Formula Funding Agreement is negotiated with Ottawa, making it the only venue for garnering necessary infrastructure.

McBean echoed Shirley, noting the importance of involving local communities. More infrastructural investment in areas where Inuit people can participate will help counter the culture of transiency that currently exists within the North’s scientific community.

Mauro emphasized communication between Ottawa and local communities and pointed to decisions on the polar bear (recently listed as a special concern species under the Species at Risk Act) and restrictions on narwhal hunting as controversial policy decisions made without proper consultation with Inuit society, inadvertently creating food security issues.

Abele discussed some common difficulties when taking traditional knowledge into account, first detailing the importance of consulting and incorporating traditional knowledge. Local knowledge is empirical knowledge gained on the land, but it also includes values and cosmological understanding. Traditional knowledge does not fit modern political processes, so we must design institutions that “embody the best traditions of old societies ... a place where modern iterations (of traditional knowledge) make sense.”

Ian Mauro expanded on the cosmological underpinnings of traditional Northern knowledge. Elders in Nunavut claimed that Earth had tilted on its axis. This information eventually became useful within a scientific framework when scientists used it to discover a climate change-induced optical mirage. Both Mauro and Jamal Shirley cited Nunamanik, the “Earth Egg,” as an example of a piece of traditional cosmology that breaks with Western understanding yet has analogs in science (namely with Lovelock’s “Gaia Hypotheses”). Shirley described such richness and breadth of information conveyed out of traditional knowledge as a challenge in land-use planning and wildlife management. Traditional knowledge must be interpreted and used within an intended context, but determining its usefulness is too often left to technical managers with no background in social sciences or language fluency. The result is a fragmentation of knowledge and a perpetuation of mistrust.

**Question 3: “Can local actions make a difference, and if so, how?”**

All panelists agreed that the adaptive potential for communities in the North was strong, as many of these communities have been living outside of the industrial economy within the last generation. With modern industrial society in crisis, traditional Northern knowledge is invaluable, Mauro said. Abele added the South should be feeling vulnerable, not the North, and Shirley responded that local actions will not only make a difference, they will be the difference. McBean reinforced these statements by discussing how local actors have successfully countered climate change in Europe, the United States, British Columbia, and Quebec.

**Discussion**

First discussed was how best to develop Northern capacities. Abele and McBean both continued making the case for in-situ capacity, and developing institutions like universities and a research sector independent from government and industry. At the community level, access to knowledge and an ability to communicate is vital. When asked if a university would divert funds to college-level institutions in the North, Shirley cited transfer agreements as important mechanisms for expanding college opportunities. Discussing more immediate adaptation strategies, he praised piecemeal efforts that involve good science and planning, like training public works employees on how to maintain culverts in anticipation of more precipitation.

# CSPC Special Sessions

Address - Gary Corbett, President PIPSC .....p.72

Genome Canada Reception - Induction of 2011 Members into the  
Canadian Science and Engineering Hall of Fame .....pp.73-75

Plenary - Examining the Prospects of a Canadian Science Policy Centre .....pp.76-79

## Luncheon Address: Gary Corbett, President, Professional Institute of the Public Service of Canada (PIPSC)



Gary Corbett began his address by thanking the CSPC and its organizers for a successful conference. The Professional Institute of the Public Service of Canada (PIPSC) supports the CSPC, Corbett continued, because they have shared objectives: they both want more attention paid to science and science policy, more science in policy making, and a science policy appropriate for the twenty-first century.

PIPSC represents over sixty thousand professionals, many of whom are scientists, and all of whom serve the public good by contributing to research, preserving the environment, and contributing to prosperity. Scientific achievement in Canada rests, Corbett argued, on three pillars: government research, private sector research, and academic research. The private sector has resources, but lacks facilities; universities develop scientific talent, but may not respond to urgent needs. Government science's only driver, on the other hand, is the public

good, and supports the work of both universities and the private sector.

These are challenging financial times, Corbett continued, and while difficult decisions have to be made, he chastised the federal government for cutting six billion dollars in funding from departments and agencies while simultaneously giving fourteen billion dollars in across-the-board tax breaks to corporations. While a new IPCC draft report suggests climate change will produce “weather on steroids,” the government is dismantling Canada’s contribution to ozone science. Federal funding of research and development has plummeted in the past few years, and our R&D-to-GDP ratio is now below the OECD average. If government research is critical for regulation and policy-making, why, Corbett asked, is it only an afterthought?

The answer, Corbett charged, is that public science faces a new threat: the federal govern-

ment’s disdain for evidence-based decision making and loss of transparency. The elimination of the long-form census is symbolic, he said, but there are many signs of the triumph of ideology over evidence, and a lack of respect for science in the halls of power.

Although government scientists are in an unenviable position, Corbett offered two positive suggestions to help get public science back on track. First, he said, we should reinstate the office of a national science adviser. Second, he continued, we should implement real whistleblower protection.

We need, Corbett concluded, a federal government that demonstrates a commitment to sound science. All three pillars of science, industrial research, academic research, and government research, need to be healthy, in order to truly build bridges for the future of science policy.

# Genome Canada Reception - Induction of 2011 Members to the Canadian Science and Engineering Hall of Fame

## Organizer

Genome Canada

## Presenters

Denise Amyot: President and CEO - Canada Science and Technology Museums Corporation

Marie Carter: Chief Operating Officer - Engineers Canada

Denise Amyot, President and Chief Executive Officer of the Canada Science and Technology Museums Corporation, welcomed the crowd to a celebration for the induction of three new members to the Canadian Science and Engineering Hall of Fame. The Hall of Fame has existed since 1999, she explained, but this marked the first time an induction ceremony had taken place outside the Museum of Science and Technology, where the Hall of Fame is housed.

The Hall of Fame was very happy, Amyot said, about its new partnership with the CSPC, and about the unique venue it provided for the induction ceremony. This year's ceremony would bring the Hall of Fame up to 51 members, all recognized for outstanding achievements not only in science and engineering, but also for their significant contributions to Canadian society.



One inductee, astronomer Sidney van den Bergh, could not be present, and so Amyot began with a brief tribute to him. Van den Bergh, known as Canada's most respected astronomer, spent nearly twenty years in the 1960s and 1970s teaching and researching astronomy at the University of Toronto. His

major interests were star clusters, variable stars, and the structure and evolution of galaxies. Other career highlights included his directorship of the Dominion Astrophysical Observatory in Victoria, BC, and his presidency of the board of the Canada-France-Hawaii Telescope Corporation. Van den



Bergh also discovered a comet, which bears his name. Amyot warmly welcomed him into the Hall of Fame.

The second inductee was senator Kelvin K. Ogilvie, a leading expert in biotechnology, bioorganic chemistry, and genetic engineering. Amyot recounted some of Ogilvie's major accomplishments, including the invention of a

Marie Carter, Chief Operating Officer for Engineers Canada, introduced the third inductee, engineer Gerald Hatch. Hatch, she said, worked in iron and titanium mining in Québec in the 1950s, and was instrumental in developing several technological advances in the field. In 1958 Hatch opened a consulting firm in Toronto, which would go on to become Hatch Associates Ltd. This firm has grown



drug used worldwide to fight infections in weakened immune systems. Upon receiving his award Ogilvie addressed the crowd, saying how difficult it was to grasp the great honour this award represented. The Hall of Fame, he continued, is a particularly important thing for Canada, since as a nation we are not good at celebrating our great heritage of science and engineering. Ogilvie expressed his thanks to his family, coworkers, teachers, and students, and the sponsoring bodies that made the Hall of Fame possible.

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from a five-person operation to a company with ten thousand employees in 65 offices around the world. Hatch himself has received numerous professional awards, the Order of Canada, and has already been inducted into the Mining Hall of Fame.

Hatch himself came on stage to collect his award. He then delivered a few brief comments about his first big project with the Falconbridge nickel mines. Hatch then invited his friend Tom Reid to read some written remarks for him, and advised the audience that success, in general, depends on high-calibre people who you treat

well. The written remarks, read by Reid, consisted of a brief biographical and professional sketch of Hatch. They underscored the importance of Hatch's relationship with his wife, who passed away after 57 years of marriage; some of the influential people and events in the young Hatch's career; and closed by thanking his great employees for their dedication, enthusiasm, and commitment to Hatch Ltd.'s culture and continuing success.

Brief closing remarks were read by Pierre Meulien, who offered his congratulations to all three inductees. Not only are they great scientists and team leaders, he said, but they serve as ambassadors of science for Canada as a nation.

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# Examining the Prospects of a Canadian Science Policy Centre

## Organizer

Canadian Science Policy Centre (CSPC)

## Moderator

Paul Dufour: Senior Policy Analyst - Paulicy Works

## Speakers

Peter Hackett: Executive Professor - School of Business and Fellow - National Institute for Nanotechnology, University of Alberta.

Chris Hornberger: Partner - Halifax Global Inc.

Mehrdad Hariri: Chair - Canadian Science Policy Conference (CSPC)

André Albinati: Principal - Earncliffe Strategy Group

## Moderator: Paul Dufour

Senior Science Policy Analyst, Paulicy Works

Dufour opened the session by stating that although the annual conferences put on by the Canadian Science Policy Centre (CSPC) have been very successful, many people are wondering what the next step is for the organization. The purpose of this plenary, Dufour explained, was for CSPC organizers to explain their vision for the future of the organization and how best to expand it, and then to get feedback from the science policy community.

## Peter Hackett

Executive Professor, School of Business and Fellow, National Institute for Nanotechnology, University of Alberta.

Hackett explained why, given the global and Canadian policy contexts, Canada needs a CSPC. Science, he said, is essential to advancing our civilization, but the way science is



being done is changing. Much of science is now done in international teams, for example, instead of in isolated labs, and modern communication allows new opportunities for innovation. Where science happens is also changing, as more and more cutting-edge work is being done in Asia. Canada has, Hackett reminded us, much to be proud of: a diverse and tolerant society, natural resources, and many achievements. But reports indicate we do not have the innovation underpinning we need, and

we are falling behind in PhD production and business R&D. In the next twenty years, Hackett predicted, sound science policy will be essential if Canada is to remain competitive in the evolving global arena. It is for this reason, he stated, that Canada needs the CSPC.

## Chris Hornberger

Partner, Halifax Global Inc.

Next, Hornberger described the extensive consultation her organization did to determine the



Canadian science policy community's needs and concerns. Through online surveys, interviews, and workshops they amassed a good representation from all sectors, including NGOs, academia, industry, and government. The stakeholders agreed, perhaps most importantly, that rather than a science policy centre, what is needed is a science policy network. Accordingly, Hornberger and Hackett decided not to use the word "centre," and will simply refer to the organization as the CSPC.

Returning to the results of the consultation, nearly 90% of respondents agreed that the Canadian science policy community is isolated and fragmented, and 85% agreed there was no forum for science policy discussion. There were several activities, Hornberger continued, that the community thought were most important. First, the CSPC should bring people together, both at the conference and throughout

the year, so that people from different sectors can link and communicate. Second, the CSPC should also have a strong educational mandate, both in terms of raising the next generation of policy thinkers, and helping decision makers think clearly about science policy. And third, respondents also thought the CSPC should help policy-makers identify factors that will affect Canada's social and economic well-being, and demonstrate the relevance of science to help solve current problems.

### **Mehrdad Hariri**

Chair, Canadian Science Policy Conference (CSPC)

Hariri spoke next, identifying three main pillars the CSPC had decided to focus on.

First, the CSPC should be a national hub, and provide a dynamic network for people to exchange ideas, plans, and projects. The confer-

ence network should be expanded, Hariri said, to encourage and foster cross-sectoral talk and collaborations. Second, the CSPC will focus on youth engagement. There is currently no forum for youth to be trained in science policy, Hariri noted, and here the CSPC could play a useful role by helping bright young people get fellowships and internships, to learn how politics works and policy is made. Third, the CSPC will focus on the science of science policy. By expanding its network, the CSPC can commission the analysis and evaluation of issues directly related to science policy in Canada. The CSPC could even, Hariri suggested, issue challenge competitions.

### **André Albinati**

Principal, Earnscliffe Strategy Group

André Albinati observed that everyone agrees on the need for better science policy, but there is also an appetite for this at the political level. Albinati explained that his daily work involves translation between politicians, entrepreneurs, CEOs, and scientists, as each audience has a unique language and set of motivations and needs. Translating between these groups is a key part of effective policy-making, he said, and an ongoing forum is necessary to do this well. To underscore the need for such a forum, Albinati referred to the current controversy surrounding the Jenkins Report and its focus on SMEs. SMEs account for 54% of the economy and 45% of R&D output, so on the face of it it seems natural that SMEs should be equitably



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represented in research councils, fields of excellence, and global markets. However, SMEs do not have enormous resources, so they need to be compensated for their time when participating in such initiatives. Discussing such problems is essential to improving policy, Albinati concluded, and a forum like the CSPC provides a place to discuss such policy gaps and barriers.

### Discussion Period

David Kent (Cambridge) praised the conference as a testament to the value of volunteer energy and limited money. Citing the CSPC's grand future plans, however, he asked how the organization planned to get funding, and whether there could be any baggage attached to funding from certain sources. Another audience member worried that if it were to charge membership fees the CSPC would become exclusive, and marginalize students and people without deep pockets. Hariri responded that fees are only for organizations, and individuals will never have to pay. The CSPC's business model, he continued, is for agencies from all sectors to pay a membership fee to become members, and get sponsorship benefits in return. The CSPC itself has to function as an independent non-profit, and this business model has worked well in other cases. Hornberger added that while this model is ambitious, it is intended to be phased in over a three-to-five-year period. The financial plan is to ensure di-

verse sources of revenue, so the CSPC will not be dependent on any single body.

An Ngo (University of Ottawa) asked about the possibility and ramifications of the CSPC providing a single voice for science policy. Hariri responded that while some stakeholders had expressed concern over the lack of a unified voice, this is not the purpose of the CSPC. Instead, he continued, the CSPC aims to make many different voices heard.

Mark Saner (Institute for Science, Society, and Policy (ISSP) at the University of Ottawa) praised the CSPC conferences as immensely beneficial. The science policy community in Canada is quite small, he said, so it is essential to work together, and he praised Paul Dufour for keeping the linkages between the CSPC and the ISSP open. Complementarity, Dufour replied, is a fundamental platform of the CSPC.

Charles Davis (Ryerson) suggested that the CSPC should institute awards to provide recognition for outstanding science policy work, both in analysis and in practice. Hariri responded that the CSPC is considering offering such awards, and also in sponsoring competitions for students to create policy proposals. However, such initiatives need support, resources, and people which the CSPC cannot currently spare, and this underscores the need for effective fundraising.

Shiva Amiri (Ontario Brain Institute) noted that many have emphasized the need for a channel through which scientists can talk to politicians, but that this did not seem to fit into any of the CSPC's three pillars. Hariri responded that this was not strictly in the CSPC's mandate; the CSPC provides a venue for stake-holders to make their voices heard, but it cannot force government to listen to anyone. Albinati added

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that while there are a number of science advice-based organizations doing excellent work, the CSPC offers something different. Rather than providing formal advice, the CSPC aids in the exploration and understanding of current science policy issues in an open forum, without the secrecy of cabinet conferences or departmental regulations.

Jeff Crelinsten (The Impact Group) asked for more details about the CSPC's proposed budget and business model for membership. Hornberger answered that the conference itself has a budget of about \$200,000, and for the expanded business model suggested the budget would increase to \$375,000-\$400,000 for the first full year of operations. A multi-tiered membership system is planned, Hornberger continued, with the highest tier over \$100,000 and the lowest around \$5,000. Each tier will give benefits linked to exposure or participation at the conference. Hornberger explained that by year five the CSPC hopes to have a total operating budget of around \$600,000, stressing that this will be a collaborative effort, as the CSPC is interested in sharing resources and collaborating with other organizations. Hornberger emphasized that similar plans have succeeded with, for example, the Science Media Centre of Canada.

Returning to the topic of influencing the government, Saner suggested that what was missing from the CSPC's action plan was lobbying. Hariri responded that while lobbying for science is a noble thing, the CSPC is not a lobby

group; if it were to adopt such a structure it could not serve effectively as a national network for dialogue. Albinati commented that one of the most effective lobbying presences is a grassroots movement, and that simply by providing a forum to talk about the issues of the day, the CSPC impacts political thinking.

Allison Hebbs (CFHSS) asked how the CSPC intended to package its conference proceedings, and show year-after-year momentum.

Hariri responded that conference sessions, and interviews with conference attendees, are recorded and posted online along with a published proceedings booklet. The most important aspect, however, is community mobilization. On that note Hariri thanked all those in attendance for their support, all the volunteers for their time, and all those who have contributed the operational and financial support that makes the CSPC possible.

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The 2011 Canadian Science Policy Conference is pleased to have a National Honorary Committee made up of prominent members of the Science Policy community. They are (in alphabetical order):

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**Canada Museum of Science and Technology**

**Canadian Circumpolar Institute**

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