2011 PAGSE Symposium Report

November 15-16, 2011
Cover photo
PAGSE delegates (from left): Krister Shalm, Steven Cooke, Catherine Beaudry, Hongshen Ma; Madhur Anand, Giovanni Fanchini, Winnie Ye, Randall Martin, Colin Novak
Executive Summary

The 2011 PAGSE Symposium was held in Ottawa on November 15 and 16, 2011, in conjunction with the Canadian Science Policy Conference. Nine leading early career academics from across the country were joined by a postdoctoral fellow from the Canadian Institutes for Advanced Research. Together they represented a range of fields in the natural and social sciences and engineering. The delegates engaged in discussions with executives, senior decision makers and policy analysts from parliament, granting councils, non-governmental and media agencies, and the private sector.

The Symposium highlighted and celebrated Canada’s intellectual strength and potential, and stimulated a keen exchange of information. It provided agency heads and government officials with informed feedback and opinions on science policy, research needs, intellectual capacity and property, from highly productive younger scientists. The delegates proposed new models for interdisciplinary research collaboration and for measuring and rewarding the impact of research. They also suggested that structured media training be made available early in a scientist’s career. Four of the delegates presented the group’s conclusions and recommendations in a panel session at the Canadian Science Policy Conference, November 16, 2011.

Résumé

Le symposium 2011 du PFST a eu lieu à Ottawa les 15 et 16 novembre 2011 dans le contexte de la Conférence sur les politiques scientifiques canadiennes. Il a réuni neuf universitaires en début de carrière, de différentes parties du pays, ainsi qu’un boursier postdoctoral, de l’Institut canadien de recherches avancées, qui représentaient ensemble un éventail de disciplines des sciences naturelles et sociales et du génie. Les délégués ont discuté avec des cadres supérieurs, des décideurs de haut niveau et des analystes des politiques de différents milieux : Parlement, conseils subventionnaires, organismes non gouvernementaux, médias et secteur privé.

Le symposium a mis en valeur et à l’honneur la force et le potentiel intellectuels du Canada et a favorisé un très bon échange d’informations. Il a permis aux dirigeants d’organismes et aux responsables gouvernementaux d’obtenir des commentaires et des avis éclairés de scientifiques plus jeunes, très prolifiques, sur la politique scientifique, les besoins en matière de recherche, la capacité intellectuelle et la propriété intellectuelle. Les délégués ont proposé de nouveaux modèles pour la collaboration aux recherches multidisciplinaires ainsi que pour la mesure et la reconnaissance de l’impact des recherches. Ils ont également recommandé qu’une formation structurée sur les médias soit offerte au début de la carrière des scientifiques. Quatre des délégués ont présenté les conclusions et les recommandations du groupe dans le cadre d’un panel tenu lors de la Conférence sur les politiques scientifiques canadiennes le 16 novembre 2011.
Introduction

PAGSE is a cooperative association of national organizations in science and engineering. It represents the Canadian science and engineering community to the Government of Canada. As one of its activities, PAGSE organizes workshops or symposia focused on science and engineering issues.

The 2011 Symposium of the Partnership Group for Science and Engineering (PAGSE) was held in Ottawa on November 15 and 16, 2011, in conjunction with the Canadian Science Policy Conference. Nine top younger researchers met executives, decision makers and policy analysts from federal, non-governmental and media agencies, and the private sector. Delegates were provided in advance with questions to stimulate discussion, as well as with the 2011 PAGSE submission to the House of Commons Standing Committee on Finance. The delegates subsequently presented their conclusions and recommendations in a session at the Canadian Science Policy Conference, on November 16, 2011.

Organization of symposium and selection of delegates

The Organizing Committee was chaired by Dawn Conway, Executive Director at the Canadian Foundation for Climate and Atmospheric Sciences. Members included Rees Kassen, University of Ottawa (Chair of PAGSE); Duncan Stewart, National Research Council Canada; Fred Boyd, Canadian Nuclear Safety Commission; Roland Andersson, Chemical Institute of Canada; and Donna Boag, Manager of PAGSE.

Selection criteria included scientific leadership and credibility (peer recognition), research productivity, and communication skills. Other considerations were representation across a range of disciplines, as well as linguistic and gender balance. Delegates were from a number of fields; several held Canada Research Chairs (Tier II).

Delegates

The delegate list follows. A bilingual pamphlet summarizing their research areas and interests was distributed at the Symposium. See Appendix 2.

Madhur Anand, University of Guelph
Catherine Beaudry, École polytechnique de Montréal
Steven Cooke, Carleton University
Giovanni Fanchini, University of Western Ontario
Hongshen Ma, University of British Columbia
Randall Martin, Dalhousie University
Colin Novak, University of Windsor
Winnie Ye, Carleton University

The delegates were joined by Krister Shalm, PDF at the University of Waterloo and junior fellow at the Canadian Institute for Advanced Research (CIFAR).
Agenda

The event was organized in 4 parts, 3 related to aspects of science and engineering policy: Science policy in practice; Science leadership; Science communications; and a presentation at the Canadian Science Policy Conference. The agenda is appended.

Delegate questions

Delegates were provided in advance, with the following discussion questions:

1. If you were in charge of federal investments in science and technology, what would be your top priority? What message(s) would you like to send a) Stephen Harper; b) the granting councils?

2. How is social media influencing how you conduct your research; or publicize your achievements? What impact has social media had on the higher education environment generally?

3. How is the research environment in your field evolving? What are the major challenges and opportunities – both nationally and internationally?

4. How could standards of research integrity be improved or better enforced?

5. What suggestions have you for improving data management / access / archiving?

6. Is your field of research sufficiently acknowledged / respected / used by policy or decision makers in the public or the private sector? How could this be improved?

Symposium sessions

The Symposium began at the Council of Canadian Academies, with a presentation by Dr. Elizabeth Dowdeswell, President of CCA. Dr. Dowdeswell stressed the need for flexibility and agility in delegates’ work, suggesting they be alert to patterns or trends. Science technology and public policy are undergoing rapid change and policy decisions are being made faster and requiring a multidisciplinary approach. Dowdeswell emphasized the value of this multidisciplinary approach. She also addressed the issue of science ‘cultures’: the need to make sense of existing data; and to recognize the different cultures (and languages) of scientists and policymakers. Science advice, she said, must be sensitive to these ‘cultures’.

Session 1: Science Policy in Practice

Marc Garneau, M.P. noted the importance of setting S&T policy and addressed the formulation of science policy in Canada. This incorporates issues such as the extent of federal government investments; broad vs. targeted support; provincial responsibilities (undergraduate education) vs. graduate and research responsibilities, which benefit from
federal support; private research vs. research in federal departments and institutes; and appropriate levels of research. He reminded delegates that science policies are inevitably linked to the policies of the party in power and challenged them to find out more about the science platforms of the individual political parties.

Several parliamentary committees report to Parliament on science matters and politicians hear from diverse groups, including university presidents, who have their own needs and expectations; however, good policy also requires consultation with scientists and engineers and this link is sometimes weak or missing. In addition, while the contribution of research to gross domestic product (GDP) is reasonable on the public funding side, it is less so on the private sector side.

Finally, Garneau raised the issue of whether science policy should be oriented to areas perceived to have commercial potential; he asked rhetorically whether we should prioritize specific areas. He referred to the Jenkins report and its recommendations. He also agreed that the role of the social sciences is undervalued.

**Dan Wayner, Vice-president, Frontier Science, NRC** pointed out that innovation is not a linear process and suggested that the next wave of discovery could well be in the field of quantum technologies. He presented the innovation landscape from the perspective of strategic intent, noting that in successful organizations, mission and corporate culture are aligned.

Wayner presented a four-quadrant decision-making model to illustrate choices in research risk and reward under different cultural models; concluding that Canada has a cultural gap when it comes to universities vs. industry.

![Four-quadrant decision-making model](image)

With regard to the uptake and use of new knowledge he indicated that politicians want stories, not numbers. He also referred to the innovation landscape and the difference between invention and innovation, the latter being linked to driving the economy. Metrics include productivity in GDP/hour; and demographics.
Finally, Wayner raised the following rhetorical questions:

- How can one match policy incentives with the capacities of players?
- How does one encourage collaboration?
- What perspective best addresses the challenge of increasing R&D in business enterprises?

In discussion, delegates commented on links with the private sector. One delegate reported that industrial links had hindered his ability to publish; another wondered about the ability of the private sector to innovate. He suggested there was a mindset in some key sectors that the private sector could be profitable without being innovative. A third delegate commented that big companies grow by acquisition not innovation. Delegates described links with companies as challenging, as the companies generally want immediate benefits despite the fact that results in some fields are achieved over the longer term (e.g. nanotechnology).

**Introduction to the Canadian Science Policy Conference (CSPC) and PAGSE session: “Fuelling Science Policy”**

Duncan Stewart and Rees Kassen led breakout groups for discussion of key issues that the delegates might present at the Canadian Science Policy Conference the following day. Delegates identified the following issues:

1. **A deplorable lack of understanding at the policy-science interface**
   - Independent science and technology advice is essential for policy and decision makers;
   - Knowledge brokers are needed to bridge the gap between science and policy.

   **Recommendation:** Examine & improve the structures of advice to governments and other policy or decision makers; provide strong tools to ensure effective use of S&T at the science-policy interface.

2. **The huge advantages of interdisciplinary research – and the persistence of huge barriers.**
   - Many disciplines remain ‘siloed’, with researchers who resist sharing data or research findings;
   - Granting Council evaluation processes for grant applications remain predominantly ‘discipline focused’;
   - Cross/interdisciplinary research is most effective in ‘big’ science fields (e.g. earth system/atmospheric-ocean science);
   - Successful collaboration yields major impact/bang for research buck;
   - SSHRC (partnership development) and NSERC (strategic workshop) grants are helping foster collaboration, but evaluation committees need both social sciences and natural sciences expertise;
   - Simplify reporting requirements for interdisciplinary initiatives.

   **Recommendation:** Encourage co-creation of research agendas in interdisciplinary initiatives, with mid level grants to support this.1

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1 Grants are often very modest or major. More mid-range grants should be available for certain initiatives.
3. Lack of recognition and a serious undervaluing of the science communication and public outreach

Outreach should be evaluated separately in the university system (e.g. evaluation procedures for tenure).
  o A culture change is required at the level of the university administration. This needs to be formally encouraged by the granting councils or in government policies.

  Recommendation: formal recognition of the value of outreach in the university reward system.

4. Desire and need of researchers to convey effectively the outcomes and impacts of their research to a range of stakeholders, including the public; and the lack of training/tools for this.
  o Structured training is needed on dealing with the media and other audiences;
  o Employers need to support the communications work of their researchers and to recognize its value, e.g. to research visibility; institutional reputation; student recruitment; accountability in use of public funds, etc.

  Recommendation: Provide resources for programs to train scientists to communicate science effectively; make this training available at an early stage of a scientist’s career.

5. Inadequacy of the metrics used for assessment of research productivity
  o Current methods for measuring and rewarding impact focus primarily on publications. This does not demonstrate full productivity / professional activity and penalizes those seeking to demonstrate benefits to society & other outcomes. There is a need to reward mechanisms that demonstrate broader impact;
  o Individuals should be able to propose areas for evaluation, including technology transfer activities, leadership, outreach, etc.

  Recommendation: supplement the metrics of publications and citations in measuring productivity. Recognize the role of social media in disseminating scientific information.

Meetings on the second day were held at the offices of the Social Sciences and Humanities Research Council and the Natural Sciences and Engineering Research Council, at 350 Albert Street. The programme included presentations on funding policy, scientific capacity and innovation policy, as well as on communications.

**Session 2: Science leadership**

The following senior executives presented information from the perspective of their councils and engaged in discussion with the delegates:

Chad Gaffield, President, Social Sciences and Humanities Research Council
Suzanne Fortier, President, Natural Sciences and Engineering Research Council
Robert Davidson, Vice-president, Programs and Planning, Canada Foundation for Innovation (on behalf of CFI president Gilles Patry).
The speakers were briefed on the issues that had emerged the previous day.

**Chad Gaffield** informed delegates of increased collaboration between scientists in the natural and social sciences and their funding councils. He described enhanced communication across barriers, tempered by an education system which encourages focus; and scientists’ comfort with exchanges within their own fields.

Gaffield reminded delegates that more than half all faculty members in Canadian universities have been hired since 2000. This, along with the challenge of adjusting to the changes of our times, has contributed to changes in program architectures as well as profound conceptual changes. He also contended that social scientists embrace the use of social media more successfully than their counterparts in other areas.

**Suzanne Fortier** spoke of NSERC’s vision and the need for Canada to use its available talent effectively in the current global environment for science and technology talent. France, for example, invests 33B Euros/year in S&T and scientific talent. Canada must be competitive, dynamic and connected, to compete.

Fortier reviewed the principles of peer review and NSERC’s priority for ‘people, discovery and innovation’ linked to the needs of society. NSERC will invest its new funds in new researchers, but the bar of excellence is rising. She challenged the delegates to explore high risk areas, to increase innovation activity and to engage in interdisciplinary research.

**Robert Davidson** summarized the funding and purpose of CFI, in particular the leverage attained with its funds and its openness to all fields, which since 2010 have included support of private sector innovation and commercialization. He described expected results. CFI’s portfolio approach is oriented to sustaining and enhancing capacity; however, partners are important for assuring the success of infrastructure that CFI support has made possible. Davidson also noted that CFI expects the owner of a facility to assume the costs of maintaining it (‘responsible stewardship’).

CFI hopes to shift to a diversified investment portfolio and expects community engagement in the preparation of plans for research infrastructure. It looks for areas of industrial strength; and would like infrastructure support to be synchronized with research support for use of the research facility or infrastructure.

Delegates and agency executives subsequently discussed several of the issues that had arisen during the presentations and that related to issues the delegates face in their academic and research activities, or that were stimulated by the questions provided to the delegates in advance of the meeting. The delegates reiterated the following points:

- The need for the metrics applied to research productivity to assess the trajectory towards impact, in other words to go beyond bibliometrics.

The council representatives noted there is resistance to interdisciplinarity within campuses: the universities could change their approaches – the delegates can help promote this.
o The need to measure productivity differently when innovation is slow: for example, evaluation of engineering progress at universities should include an evaluation from the users of the information.

o The problem of industry links slowing publication, which in turn affects tenure. This requires a paradigm shift in evaluation of merit.

o Discipline barriers and the effects of discipline characteristics on the science policy interface and on communications.

o The challenge of achieving balance between stipends for graduates students in the laboratory and the need for higher grant levels.
Session 3: Science Communications

Delegates were provided with a kit of background materials on media relations and other communications tools.

Speakers Peter Calamai, freelance science writer and former journalist, and Elizabeth Howell, senior reporter at the Ottawa Business Journal, made presentations on the theme: “What makes journalists tick? A peek at the psyche of reporters and editors and how this affects coverage of science.”

Peter Calamai described the differences between science (slow, incremental; evidence-based; in-depth; focused on specifics; rational; requiring appropriate credentials) and journalism (deadline-driven; providing an overview and conclusions; certainty, generalizations; perspective, emotion). Inconclusiveness, he suggested, could constitute a story. He also reviewed four key rules of journalism:

- All news is relative
- Urgent trumps important
- There is never enough time or space for what the journalist or interviewee wants included
- News rooms are hierarchical, not collegial.

Calamai also described various approaches to presenting (framing) a story:

- The quest
- David vs. Goliath
- Perilous adventure
Race against time
- Evil around us
- Overcoming personal tragedy
- ‘Now it can be told….’

These approaches were illustrated with a quadrant diagram:

Journalistic approaches

More drama

sensationalism

Less detail

lurid

Journalist

Researcher

Less drama

Calamai stressed the importance of journalists ‘asking the right questions’. He encourages this in a course on scientific methods and objectives, given to students in their final year at Carleton University’s School of Journalism. Delegates were informed that journalism is a craft or trade rather than a profession.

Finally, he reviewed a brochure published by the Science Media Centre of Canada, on dealing with the media; and advised delegates to consult it every time they are contacted for an interview.

Elizabeth Howell focused on the instantaneous transmission of information using social media and its use in web journalism. Web journalists are generally young; tech savvy; prolific; look for stories that are visually compelling, sometimes at the expense of accuracy; and believe that errors on a website can be corrected even after they become public. People reading news on the web also tend to be young and tech savvy. Howell described the practice of ‘churnalism’, whereby a press release is reworked for further distribution. She advised the delegates to:

- Clear a press release in advance
- Ensure a contact person and photos are available to the journalist.

Finally she noted that information is distributed for free using social media. To compete, newspapers will often charge for reports, but provide opinions for free (e.g. on Dow Jones).
Presentation by SSHRC V-P Dr. Brent Herbert-Copley

Brent Herbert-Copley presented information on SSHRC’s Talent Program. He was accompanied by Gordana Krcevinac, Director of SSHRC’s Research Training Portfolio.

SSHRC is reviewing its programs for young researchers, with a view to reorganization of its talent programs. It has launched a consultation with the community to obtain feedback. Recommendations for change will be made to SSRC Council in the Spring.

Between 50-60 % of SSHRC funds are directed to students; and some student programs are tri-council or co-delivered in partnership with universities. SSHRC is concerned about certain issues, such as the time it takes to PhD (6 years and 8 months on average) and saddened that some students never do graduate. Contributing factors include the breadth of skills required and international mobility. SSHRC would like support to students, both direct and indirect, to be better coordinated.

Delegates were invited to provide feedback on the SSHRC consultation by visiting the SSHRC website and linking to the consultation document.
In discussion, delegates expressed shared concern about non-completion of graduate degrees. They mentioned the importance of mentoring of students, as well the influence of the labour-market and the time requirements of fieldwork.

**Preparation for the PAGSE session, Canadian Science Policy Conference (CSPC)**

The Chair of PAGSE described the PAGSE challenge, as expressed in the abstract for the PAGSE session at the CSPC. The following themes arising from discussion were reviewed and four panellists selected, to speak to them at the CSPC session:

1. Science impacts
2. Barriers
3. Collaboration on key issues
4. Criteria for success, including new models for collaborations (e.g. joint creation of agendas; criteria for evaluation of impact).
Challenges for Young Researchers: Insights from the 2011 PAGSE Symposium

Abstract: Fuelling Science Policy – new leaders speak out. Young scientists and engineers comprise a critically important, mobile pool of talent that stands to change the geography of knowledge in fundamental ways. Join a discussion with outstanding early career researchers from across Canada, as they present provocative views on the challenges and opportunities they face in driving the science agenda in the country over the next 25 years.

The convener, Rees Kassen, described PAGSE’s charge to the delegates: to consider a vision for science for the future and what was necessary to achieve it. Four panellists summarized the views and conclusions of the PAGSE delegates, focusing on: science impacts; barriers to success; collaboration issues; and possible solutions/criteria for assessing success.

Hongshen Ma: Current challenges include the need for scientific and technological information (the ‘need to know’); training to assure future intellectual resources; technologies to address evolving needs – and measures of the effectiveness of science and technology in advancing transformational change; as well as assessment of the influence of S&T on public decisions (e.g. public good).

Madhur Anand: There are a number of structural and cultural barriers to achieving the vision. These include a deplorable lack of exchange at the science-policy interface and continuation of a silo mentality. Some science is inherently interdisciplinary: this includes environmental science/the science of sustainability. In other areas, scientists resist partnerships with counterparts in other areas. This can affect sectors (e.g. government-university) as well as cooperation between natural vs. social sciences. There is a need for greater outreach to bring scientific advances and their importance to the attention of stakeholders. In particular there is a need to ‘incentivise’ science communications. It was suggested that each university have a dedicated science communications advisor.

Steven Cooke: Solutions must be cross-cutting. Interdisciplinarity and internationalism are increasingly important and could be applied to the joint definition of research agendas. There is also a need to improve mechanisms for fostering partnerships, e.g. foreign partners may have funds to collaborate but Canadian scientists often do not. New training opportunities are needed as is a change in the culture of scientific disciplines and policymakers, including greater transparency between groups to avoid unnecessary protection of data.

Catherine Beaudry: Our ability to maximize the value and impact of scientific knowledge hinges on transfer and uptake of that knowledge. Criteria for measuring success will help monitor this. Such criteria should take into account service to society; the development of knowledge in emerging areas; the success of incentives; cooperation between social and natural sciences; and other issues. For success in knowledge mobilization we must take advantage of intermediaries between science and policy, including the role played by scientific societies; and to link to existing networks and tools at universities. Cooperation is key.
The session was followed by a lively Q&A session with the over 70 conference delegates in attendance.

Rees Kassen, Chair of PAGSE introduces panellists at the PAGSE session, CSPC, November 16, 2011
PAGSE delegates respond to questions at the Canadian Science Policy Conference
From left; Rees Kassen (PAGSE Chair), Hongshen Ma, Madhur Anand, Steven Cooke, Catherine Beaudry
Conclusion

The Symposium highlighted and celebrated Canada’s younger cadre of researchers and stimulated a keen exchange of information. It provided agency heads and government officials with informed feedback and opinions on science policy, programs, research needs, intellectual property and highly qualified research personnel, from highly productive younger scientists. Delegates particularly welcomed the opportunity for informal dialogue with the presidents of NSERC and SSHRC after the formal session. Discussions demonstrated the benefits of research in economic, social, political, environmental and cultural areas, all of which are important to Canada.

The communications session led to a suggestion that structured training be available early in a scientist’s career. New models were proposed for interdisciplinary research collaboration and for measuring and rewarding the impact of research.

PAGSE was pleased to introduce the delegates to its activities and to establish links with this impressive group of early career scientists and engineers. It is grateful to the delegates for freely sharing their experience and for their recommendations, and to the sponsors for their support for the event.

Sponsorships

Delegate travel and hotel costs; CSPC registrations; as well as administration, catering, translation and printing costs were covered through sponsorships, in cash or in-kind, from the following:

- Canada Foundation for Innovation
- National Research Council Canada
- Universities: Windsor, Carleton, Dalhousie
- Council of Canadian Academies
- Social Sciences and Humanities Research Council
- Canadian Foundation for Climate & Atmospheric Sciences
- Canadian Science Policy Conference (CSPC)

The Partnership Group for Science and Engineering warmly thanks the delegates, agency representatives, participants and sponsors for helping to make the 2011 Symposium such a success.
The Partnership Group for Science and Engineering (PAGSE) is a cooperative association of some 25 national organizations in science and engineering, representing over 50,000 individuals from industry, academia and government sectors. It was formed in June 1995 at the invitation of the Academy of Science of the Royal Society of Canada. On behalf of its members, PAGSE addresses issues concerning the nature, importance and benefits of science and engineering to Canadians, and promotes greater understanding by decision-makers of the role of science and technology (S&T) in Canada’s prosperity.

December, 2011
Appendices

Appendix A  Delegates
Appendix B  Agenda
Appendix A

Delegates - PAGSE Symposium 2011

Madhur Anand  
University of Guelph  
The rapid pace and far-reaching implications of ecological change in the face of globalization and climate change are creating stress within ecosystems all over the world. There is an ever-increasing threat of extinctions of species, communities, and ecosystems along with the services and functions that they support. Understanding the multiple and complex effects of ecological change at different scales (local to global, recent to historical) is at the core of Dr. Madhur Anand’s research. A recent holder of the Canada Research Chair (Tier 2) in Global Ecological Change at the University of Guelph, her work highlights similarities and differences between ecological events and practices on different continents, with a view to fostering knowledge exchange. Her work also provides tools for applying emerging interdisciplinary theories, improved quantitative methods and predictive simulation models to the preservation, recovery and restoration of perturbed and vulnerable forest ecosystems worldwide.

Catherine Beaudry  
École Polytechnique de Montréal  
Solid science, technology and innovation policy is important to Canada; but how do we know what works and what doesn’t? Social network analysis provides a tool for assessing the performance of innovation systems and technology clusters, by studying the scientists/inventors involved in these clusters, patents generated and links with other groups. It also examines the key role of senior scientists as driving forces for growth and innovation in a cluster and in controlling the flow of knowledge. Dr. Catherine Beaudry’s expertise is in the economics of science, technology and innovation, using applied econometrics for its analysis. Her research focuses on the effectiveness and characteristics of innovation clusters in areas such as bio- and nanotechnology— including the impact of extensive patenting and contracting on scientific production. Her interests also cover how partnerships, alliances and industrial clusters affect innovative performance of firms, and their corporate survival.

Steven Cooke  
Carleton University  
Fish and aquatic resources around the globe face threats linked to human activities and environmental change. Dr. Steven Cooke and his team conduct interdisciplinary research related to the conservation and science-based management of aquatic resources. Dr. Cooke is particularly interested in the energetic, fitness, and potential evolutionary consequences of a variety of natural (e.g., winter, reproduction) and anthropogenic (e.g., angling, environmental pollution) stressors. He has published over 225 peer reviewed papers on topics ranging from conservation social science and stakeholder engagement to behavioural endocrinology and comparative biochemistry. He currently holds the Canada Research Chair (Tier 2) in Fish Ecology and Conservation Physiology; and directs the Fish Ecology and Conservation Physiology Laboratory at Carleton University. Beyond identifying problems, Dr. Cooke’s lab adopts a solutions-based approach involving the development and refinement of strategies to address conservation problems.

Giovanni Fanchini  
The University of Western Ontario  
Developing new, degradation free, solar-grade materials at low cost and high stability is essential for the future of solar energy. Dr. Giovanni Fanchini’s research encompasses the use of organic and carbon-based nanomaterials for optical and energy applications, with a focus on transparent conductors, graphene-nucleic acid nanocomposites and degradation mechanisms of inorganic and organic solar cells. He holds the Canada Research Chair (Tier 2) in Carbon-based Nanomaterials and Nano-optoelectronics at the University of Western Ontario. Dr. Fanchini has been working for more than a decade on different
types of carbon-based nano-materials, including diamond-like carbon, carbon nitrides, boron carbide, carbon nanotubes, blends of fullerenes and photoactive polymers; and, since 2006, graphene.

Hongshen Ma  
University of British Columbia
The mechanical properties of biological cells can be used to detect the presence and evaluate the status of a wide range of human diseases. Microscale fabrication technologies developed for microelectronics manufacturing provides the ability to create structures at the length scale of individual cells. Microfluidics, an extension of microfabrication technologies, further presents techniques to control the flow of extremely small volumes of liquid. Dr. Hongshen Ma’s research leverages these capabilities to develop new biomedical technologies to measure the mechanical properties of individual cells, as well as to separate cells based on their mechanical properties. These technologies are being applied to several clinical problems including the isolation of circulating tumour cells, the detection of malaria infection, and evaluation of the quality of stored blood.

Randall Martin  
Dalhousie University
Considerable uncertainty remains in our knowledge of the processes affecting air quality and climate change. Satellite remote sensing is revolutionizing our understanding of atmospheric composition by monitoring regions and phenomena that are otherwise difficult to observe. Global chemical transport models offer the three-dimensional perspective of the atmosphere that is needed to analyze the vast amount of information provided by satellites. Dr. Randall Martin, the youngest Killam Professor in Dalhousie University’s history, is a recipient of the Langstroth Memorial Teaching Award, an NSERC Discovery Accelerator Supplement, and a Killam Prize. He develops and applies space-based observations and global models to improve understanding of air quality and climate change.

Colin Novak  
The University of Windsor
Psychoacoustics extends the traditional engineering measurement of sound and vibration, to how humans actually perceive noise. The research requires engineers, psychologists, speech therapists and other health care professionals, to help solve human health and safety issues such as the effect of ultra-low frequency, high amplitude sound produced by large scale wind energy installations. Dr. Colin Novak is the director of the Noise, Vibration and Harshness - Sound Quality Lab at The University of Windsor. His research focuses on psychoacoustics, sound quality and noise control directed towards projects in the area of automotive and alternative energy systems, as well as the development of loudness calculation metrics and the study of hearing perception.

Winnie Ye  
Carleton University
The search for new vaccines and drugs almost always begins with screening mixtures of organic compounds for specific biological activity. Nano-sized optical sensor technologies may offer a low-cost and effective way to screen these compounds for tiny amounts of particular complex organic chemicals. Dr. Winnie Ye holds the Canada Research Chair (Tier 2) in Nano-scale Integrated Circuit Design for Reliable Opto-electronics and Sensors, at Carleton University. Her current research interests are on micro- and nano-photonics and their applications in optical sensing. Dr. Ye’s work may ultimately lead to the identification of organic compounds to treat life-threatening diseases such as malaria, anthrax, tuberculosis and stomach cancer, and could eventually aid in the discovery of vaccines or new drugs.

Guest

Krister Shalm  
University of Waterloo & Fellow, Canadian Institute for Advanced Research
Krister Shalm is a CIFAR Junior Fellow at the University of Waterloo. An experimental physicist, he is interested how quantum mechanics can be applied to our everyday lives. While working on his PhD he used the quantum nature of light to study ways to make a “quantum ruler” capable of sensitive measurements. He is currently developing new experimental techniques and methods to manipulate, control, and characterize quantum systems that can be applied to other disciplines.
# Agenda

**Tuesday November 15, 2011**
Location: Board Room, Council of Canadian Academies, Suite 1401, 180 Elgin St., Ottawa

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<td>11:30</td>
<td>Working lunch (hosted by CCA)</td>
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<td>Welcome &amp; introductory comments</td>
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<td>• Address by <strong>Dr. Elizabeth Dowdeswell</strong>, President, CCA</td>
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<td>12:30</td>
<td>Review of objectives and agenda</td>
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<td>13:00</td>
<td><strong>Session 1: Science policy in practice</strong></td>
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<td>• <strong>The Hon. Marc Garneau</strong>, M.P.</td>
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<td>• <strong>Danial Wayner</strong>, V-P, Frontier Science, National Research Council Canada</td>
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<td>14:00</td>
<td>Discussion</td>
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<td><strong>Introduction to the Canadian Science Policy Conference (CSPC) and PAGSE session:</strong></td>
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<td><em>“Fuelling Science Policy”</em></td>
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<td>15:10</td>
<td>Discussion of issues</td>
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<tr>
<td>15:20</td>
<td>Breakout groups – identification of top 3 ideas/issues</td>
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<td>16:10</td>
<td>Reports from breakout groups</td>
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<tr>
<td>16:45</td>
<td>Preparation of PAGSE White Paper and of presentation for CSPC</td>
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<tr>
<td>18:00</td>
<td>Adjournment</td>
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*Free evening*
**Wednesday November 16, 2011**  
Location: Room 125, 18th Floor, SSHRC/NSERC Building, 250 Albert Street, Ottawa

<table>
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<th>Time</th>
<th>Event</th>
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| 09:00 | **Session 2: Science Leadership**  
Presentation of key issues to council presidents |
| 09:15 | Presidents of Granting Councils/funding bodies:  
• Chad Gaffield, President, SSHRC  
• Suzanne Fortier, President NSERC  
• Robert Davidson, Vice-president, Canada Foundation for Innovation |
| 10:00 | Discussion |
| 10:30 | Coffee |
| 10:50 | **Session 3: Science Communications**  
*An information kit will be provided*  
*What makes journalists tick? A peek at the psyche of reporters and editors and how this affects coverage of science.*  
• Peter Calamai, Freelance science writer  
• Elizabeth Howell, Senior reporter, Ottawa Business Journal |
| 12:15 | Lunch  
• Brent Herbert-Copley, V-P Research Capacity, SSHRC |
| 13:00 | Fine tuning of the PAGSE White Paper and of the panel for CSPC |
| 14:00 | Walk to Ottawa Convention Centre, 55 Colonel By Drive – Ottawa Room |
| 15:30 – 17:15 | Canadian Science Policy Conference - PAGSE session: **Fuelling Science Policy**  
*Challenges for Young Researchers: Insights from the 2011 PAGSE Symposium*  
Panel presentation on key policy issues  
Discussion and Q&As |
| 18:00 – 21:00 | CSPC Conference opening; keynote session; reception |

**Thursday November 17-Friday November 18, 2011**

Optional attendance at CSPC sessions