



# 2017-2018 Annual Report

## OUR MISSION

To serve Canada and Canadians by recognizing Canada's leading intellectuals, scholars, researchers and artists and by mobilizing them in open discussion and debate, to advance knowledge, encourage integrated interdisciplinary understandings and to address issues that are critical to Canada and Canadians.



## OUR HISTORY

The Royal Society of Canada (RSC) was established in 1882 as a collegium of distinguished Canadian scholars and scientists, under the auspices of the Governor General of Canada, His Excellency the Right Honorable the Marquis of Lorne. It was incorporated by Act of Parliament on May 25th, 1883. Over the years, more than 4000 men and women have been elected to the Fellowship. Canada's National Academy, the RSC is a not-for-profit organization infused with a strong spirit of cooperation, one that recognizes and celebrates excellence within the Fellowship, shares knowledge and research, and voluntarily provides independent evidence-based policy advice to Canadians.

## OUR SOCIETY

The Royal Society of Canada consists of three bilingual Academies and the College of New Scholars. Fellows and Members are elected from the social sciences and humanities, the natural sciences and engineering, and the health sciences and artistic fields.

# MESSAGE FROM THE PRESIDENT



In her remarks at last year's Celebration of Excellence and Engagement, Her Excellency the Governor-General of Canada and RSC honorary patron, Julie Payette, emphasized that "Canada and the world are facing many challenges and opportunities, many of which are deeply complex and intertwined. We need everyone's involvement, and in particular the talented and creative minds of the Royal

Society of Canada to cooperate, move forward and help find solutions for the future."

One year later with the guidance of our new Strategic Plan, *Mobilize, Catalyze, Sustain*, I am delighted to report considerable progress in *mobilizing* leaders within and beyond the RSC to *catalyze* informative and advisory activities for *sustained* impact. Throughout 2018, we have been benefitting greatly from our defining strength: members who are exceptionally talented leaders across all research fields and from multiple generations in numerous domestic and international communities.

Highlights include our G7 initiative with domestic and international partners; the strengthening of our pan-Canadian presence on the model of RSC Atlantic; and the updating of governance and management structures, policies and practices to embrace inclusive excellence, efficiency and effectiveness in our operations.

As host for the G7 Science Academies, Canada's national representative, the RSC embraced the opportunity to contribute the latest insights and evidence to the political deliberations of G7 political leaders. Following engagement with federal colleagues and together with G7 Academy partners, we selected two topics for specific attention not only in formal statements on them but also in a series of G7 Research Summits: (1) The Global Arctic: the sustainability of northern communities in the context of changing ocean systems; and (2) Our digital future and its impact on knowledge, industry and the workforce.

As our major strategic effort to cultivate informed discussion and public policy debate, the RSC G7 initiative has been wonderfully successful, if we judge by partner engagement, attendance at events and feedback within and beyond government. With the active support of Minister of Science and Sport, Kirsty Duncan, and Canada's G7 Sherpa, Peter Boehm (now Senator), many of the Academy recommendations on Our Digital Future and the Global

Arctic were reflected in the G7 Summit Communiqué as well as the seven Charlevoix commitments. These documents included, for example, our recommendations on ensuring ethical and human-centered approaches to AI, promoting lifelong learning and digital literacy and promoting research and development in ocean science.

It is similarly encouraging that, thanks to the initiative of many RSC members, we are making impressive progress toward our strategic goal of building on the success of RSC Atlantic by working toward additional regional hubs. Last winter and spring, colleagues in British Columbia and in Québec began meeting to explore how best to leverage local engagement with pan-Canadian collaboration in order to deepen and enrich the impact of our various initiatives. We are now hopeful that RSC Pacific and RSC Québec will be officially established in the coming year. More immediately, we have now finalized RSC@Massey, a new partnership with Massey College that includes a position of Visiting Fellow as well as the opportunity to take initiatives in the greater Toronto area; we look forward to the initial year of programming in 2019.

Throughout the year and thanks to the advice of key RSC members, we have been updating our policies and processes including those related to nomination and selection of new Fellows and College Members as well as governance and ethics. In all our activities, we have been focused on the principles of inclusion, equity and diversity in order to make decisions reflecting the highest standards of excellence. The implementation of these and other components of our strategic plan would not be possible without the talent and determination of those at the secretariat in Walter House, and it is a privilege to work with them.

Much more needs to be done, of course. I invite all RSC members and friends to read this Annual Report not only to review the past year but also with a view toward contributing to, and perhaps accelerating, our strategic plan in 2019 and beyond. As the headlines remind us every day, there seems no more important work for us than to cultivate societal trust in science and scholarship as an essential underpinning of enhanced quality of life for all. While we can be confident that steps forward have been taken, we must continue to act boldly and collaboratively to do all that we can to help make a better a future for Canada and the world.

A handwritten signature in black ink, which appears to read "Chad Gaffield". The signature is stylized and fluid.

Chad Gaffield  
President

# MESSAGE FROM THE EXECUTIVE DIRECTOR

Dear Colleagues,


The new Strategic Plan—*Mobilize, Catalyze, Sustain*—arrived at an auspicious moment for the team at Walter House, providing a clear road map to leverage the momentum of recent growth in regional, national and international activities. The strategic plan set the stage for a number of initiatives that have strengthened our nimbleness and performance in supporting the work of Council and the key activities of the membership in a number of ways.

Our team has strengthened with Linda Clauson's enhanced role as Chief Financial and Administrative Officer, assuming oversight of the day-to-day functioning of Walter House and our team. Together, our team has implemented a new financial system, soft-launched a new website, and expanded our communications tools. These updates have enhanced our speed of responsiveness to inquiries from members and partners; diffused a renewed branding, logo and coloration; and increased our organizational nimbleness, as you will have noticed from your personalized voting experience in this year's RSC and Academy presidential election processes. These tools have also supported the Walter House team in seizing opportunities such as those that arose in the context of the G7 events held this year.

The increasing strength of the team at Walter House has been enabled by Council's standing committees, which have worked throughout the year to enhance pathways both in terms of internal processes such as elections and nominations, and also in terms of the ways in which the RSC fulfills its core roles such as the recognition of excellence and the provision of advice. Updated terms of reference for the Committee on Public Engagement will leverage many of these newly created tools in order to more effectively disseminate findings and mobilize knowledge.

As we arrive in Halifax for our annual celebrations, I am delighted to confirm that we have secured partnerships for the RSC's Celebration of Excellence and Engagement for the duration of our new strategic plan. This forecasting enables us to build out the contours of these wonderful celebrations in the unique co-creation model that serves the RSC so well.

In reflecting on the year behind us, we also keep our eyes fixed forward in the conviction that, ultimately, our organization is about people committed to working together. The complimentary contributions of the membership and the team at Walter House form an integral component of the RSC's future. This future continues to brighten.



Darren Gilmour  
Executive Director





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## BOARD OF DIRECTORS

### **President**

Chad Gaffield (2017-2019)

### **Past President**

Maryse Lassonde (2017-2018)

### **President, Academy of the Arts and Humanities**

Jean Grondin (2017-2019)

### **President, Academy of Social Sciences**

Alain G. Gagnon (2017-2019)

### **President, Academy of Science**

Vijaya Raghavan (2017-2019)

### **President, College of New Scholars**

Cynthia Milton (2016-2018)

### **Secretary**

Sheila Embleton (2015-2018)

### **Treasurer**

Jean-Marie Toulouse (2015-2018)

### **Institutional Member Representative**

David Barnard (2015-2018)

### **External Member**

Chris Loreto (2013-2018)

## MOBILIZE CATALYZE SUSTAIN

In the fall of 2016, the RSC Council committed to the development of a strategic plan in keeping with the latest research findings on consultation and engagement. From late 2016 to late 2017, Fellows, Members of the College, Institutional Member leaders and others from the larger society participated in meetings and gatherings across Canada.

Eleven months of engagement and consultation produced a rich assortment of perspectives and ideas. Following the year-long consultation, the RSC made the following strategic choices for the coming five-year period:

### MOBILIZING THE MEMBERSHIP

The strength of the RSC lies in its membership that spans research fields, generations and Canada together with members and partners around the world. The objective of this priority is to optimize this unique capacity by strategically mobilizing members to engage each other and the larger society on specific issues of concern.

### CATALYZING NEW CONTRIBUTIONS

The ability of the RSC to have impact in its activities is closely connected both to the means and the ends of such activities. In the changing context of the early 21st century, the objective of this priority is to create and implement new strategic ways to engage effectively in keeping with our unique cross-disciplinary and multigenerational membership, and the network of Institutional Members.

### SUSTAINING MOMENTUM

The success of the RSC over the past 135 years has reflected continuing efforts to renew and grow in keeping with the changing times. The objective of this priority is to ensure that near-term goals and activities are informed by a long-term vision to ensure the enduring success of the RSC.

## INTERNATIONAL ENGAGEMENT

### THE RSC'S INTERNATIONAL ENGAGEMENT STRATEGY

1. The RSC will address major global challenges collaboratively by mobilizing its multidisciplinary and multigenerational leadership with other National Academies to understand the current state of knowledge; to identify research or knowledge gaps in technology and policy development; and to share approaches and action plans to address some of the world's most pressing issues.
2. The RSC will advance inclusive excellence through international collaboration. In proactively updating our own practices with respect to gender, diversity and inclusion, the RSC recognizes that a wide range of approaches are required to address these global issues. The RSC will work collaboratively with other national academies to enhance mutual learning toward more effective modes of inclusive excellence.
3. Through its Committee on Public Engagement, the RSC will continue its commitment to contributing to the defense of human rights through the leadership of the Human Rights Network based at the US National Academies.
4. The advisory capacity of the RSC will be marshalled in collaboration with our cohort Academies around the world to monitor emerging trends of research and provide a 'Canadian perspective' on selected advisory documents from partners such as expert panel reports.



*Marie D'Iorio,  
International Secretary*

# IMPLEMENTING THE STRATEGIC PLAN: G7 RESEARCH INITIATIVES

## G7 ACADEMIES' SUMMIT

March 18-20, The Museum of Nature/The Westin, Ottawa

The year 2018 was a banner year for Canada in terms of showcasing leadership on global topics based on robust research. RSC Fellows and College Members have built their careers in the context of Canada's impressive Federal support for world-class science and scholarship during the past half-century. Canada's hosting of the G7 offered an ideal opportunity to share insights and evidence about global issues and along the way, of course, an opportunity to illustrate how research in Canada has moved from the international margins to centre stage.

Each year since 2005, the National Academies of the G7 countries have delivered joint statements in time for the G7 political summit, articulating the best available knowledge on key matters of global concern. The objective of the statements is to contribute to the deliberations of the political summit.

Following a consultation period during the summer and fall of 2017, the RSC selected two topics for drafting during the G7 Academies' Summit: (1) *The Global Arctic: The sustainability of northern communities in the context of*



President Dr. Chad Gaffield welcomes Dr. Marcia McNutt, President, National Academy of Sciences (NAS) of the United States to the Canadian Museum of Nature.

*changing ocean systems; and (2) Our Digital Future and its Impact on Knowledge, Industry, and the Workforce.* The statements were presented to Minister Duncan in April.

Using the statements as a starting point, the RSC organized a series of events throughout 2018 that focused on enriching discussion of these topics.

The full text of both statements is available on Pages 40-46.



INSTITUT DE FRANCE  
Académie des sciences

ACCADÉMIA NAZIONALE DEI LINGUI

NATIONAL ACADEMY OF SCIENCES



Leaders from the National Academies of the G7 Nations (L to R): Dr. Marina Koch-Krumrei, Germany; Dr. Kazuhiko Takeuchi, Japan; Giovanni Seminara, Italy; the Hon. Kirsty Duncan, Minister of Science and Sport; Dr. Chad Gaffield, President; Dr. Marcia McNutt, United States; Sébastien Candel, France; Dr. Eric Wolff, United Kingdom

## OUR DIGITAL FUTURE SUMMIT

April 26, National Research Council, Ottawa

With the participation of national and international leaders in the field, the summit helped imagine our digital future, building on the G7 Science Academies' statement entitled "Realizing Our Digital Future and Shaping its Impact on Knowledge, Industry, and the Workforce." (Full text on Page 40.)



The Hon. Kirsty Duncan, Minister of Science and Sport, speaks about the importance of understanding our digital future (above).

G7 Sherpa (now Senator) Peter Boehm receives the Statements of the G7 Academies on behalf of the Government of Canada (right).



## DATA TO INSIGHTS SUMMIT

September 24, Ottawa

A two-day summit devoted to the ways in which the increasing availability of data is translating into insights was planned for September 24-25 in Ottawa. A series of tornadoes in the Ottawa region in mid-September obliged the RSC and Statistics Canada to instead convene a roundtable of experts in Gatineau.

## MEMORY INSTITUTIONS IN THE DIGITAL AGE

December 5, Libraries and Archives Canada, Ottawa

This upcoming event, coordinated in partnership with Libraries and Archives Canada, SSHRC, and the CCA, features key leaders who will examine the current state and future prospects for confronting the challenges and seizing the opportunities for libraries, archives, museums and other memory institutions in the digital age.

## ARCTIC SUSTAINABILITY SUMMIT

May 23-24, Palais des Congrès, Montreal

The Arctic Sustainability Summit gathered domestic and international leaders together to envision a future of Arctic sustainability that gives life to the G7 Science Academies' declaration entitled "The Global Arctic: The sustainability of northern communities in the context of changing ocean systems." (Full text on Page 44.)



The RSC G7 initiative was strengthened through close collaboration with Mona Nemer, Chief Science Advisor (left) and Jackie Dawson, Chair of the drafting committee on Arctic Sustainability (third from left).



Photo: GG05-2018-0147-013,  
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Sgt Johanie Maheu, Rideau  
Hall © OSGG-BSGG, 2018.



Her Excellency the Right Honourable Julie Payette, Governor General of Canada and the Viceregal Patron of the RSC, delivers the closing plenary at the Arctic Sustainability Summit (above).



Natan Obed, President of the Inuit Tapiriit Kanatami, speaks about the leadership role of Inuit in research (above left).

Rémi Quirion, Chief Scientist of Quebec, introduced the Governor General (left).

# IMPLEMENTING THE STRATEGIC PLAN: THE YEAR IN PICTURES

## AN INFORMED VOTE: FORUM ON ELECTORAL REFORM

October 22, Vancouver

RSC Pacific hosts a panel discussion on electoral reform. (L to R): Philippe Tortell, Ken Carty, Richard Johnston, Graeme Wynn.



## ALICE WILSON AWARD PRESENTATION

October 18, Canadian Museum of Nature, Ottawa

Chad Gaffield, and the Hon. Catherine McKenna, Minister of Environment and Climate Change present two of the 2018 Alice Wilson Awards to Mahrsa Jessri and Évelyne Jean-Bouchard.



## HIGHER EDUCATION IN NORTHERN CANADA

October 1-3, Yukon College, Whitehorse

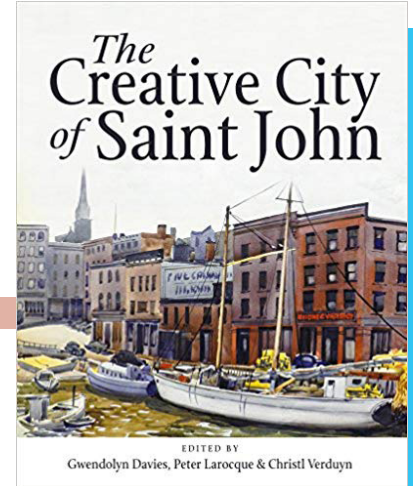
The Yukon Learning Tour visits Single Track to Success in Carcross, Yukon. (L to R): Matt Dobbs, Lenore Newman, Graeme Wynn, Catherine Connelly, Shane Wally, Dominic Smith-Johns, Russel MacDonald, Cynthia Milton, George Belliveau



## THE CREATIVE CITY OF SAINT JOHN BOOK LAUNCH

November 3, New Brunswick Exhibition Centre, Saint John

Edited by Gwendolyn Davies, Peter Larocque, and Christl Verduyn



## YVAN ALLAIRE MEDAL PRESENTATION

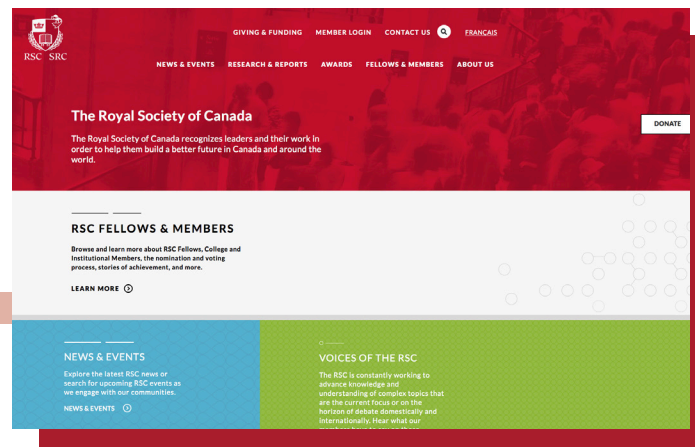
October 16, Walter House, Ottawa

Donald Savoie is awarded the inaugural Yvan Allaire Medal at a reception at Walter House. (L to R): Senator Percy Mockler; Sandra Irving, Donald Savoie, Arthur Irving, Mona Nemer, Chad Gaffield.



## LAUNCH OF NEW RSC WEBSITE

September 1



## CARA AT WALTER HOUSE

May 29, Walter House, Ottawa

Administrators from several of our Institutional Members and the Canadian Association of Research Administrators meet with the Walter House team.



## RSC QUEBEC INAUGURAL EVENT

April 17, Université du Québec à Montréal, Montréal

The inaugural RSC Quebec event features panelists (L to R): Raffaele Iacovino, Paul John Murdoch, Jean-Marc Fournier, Johanne Poirier, Jean-François Gaudreault-Desbiens, and Guy Laforest.



## CONTEMPORARY INEQUALITIES

University of Toronto Press publishes the outcomes of the RSC Symposium on Social Justice in the 21st Century: A New Intergenerational Contract

**CONTEMPORARY  
INEQUALITIES  
AND  
SOCIAL  
JUSTICE  
IN CANADA**  
EDITED BY  
**JANINE BRODIE**

## CONGRESS 2018

May 29, University of Regina

Merritt Turetsky and Ian Mauro present Opportunities for Digital Transformation in Canada's Arctic at Congress 2018.



## SITE C: DAMMED IF YOU DO, DAMNED IF YOU DON'T

April 19, Vancouver

Graeme Wynn introduces the RSC Pacific event discussion the Site C dam. The event featured presentations from Mark Jaccard, Karen Bakker, and Gordon Christie.



## THE SHOE PROJECT

2017-18, Halifax/Fredericton/Charlottetown

RSC Atlantic holds a series of symposia in the winter and spring of 2018. Pictured below is the Fredericton event.



## EASTERN ONTARIO REGIONAL SEMINAR

April 14, Queen's University, Kingston

John Burge and Amir Fam facilitated the Eastern Ontario Regional Seminar.



## ASSESSMENTS FOR A BETTER FUTURE

Throughout 2018 the RSC, the Canadian Academy of Engineers, and the Canadian Academy of Health Sciences continue their governing role of the assessment process of the CCA.



## MUSKRAT FALLS SYMPOSIUM

February 21-22, Goose Bay, Newfoundland and Labrador

RSC Atlantic and the College of New Scholars leads a symposium discussing the Muskrat Falls Hydroelectric Dam in Labrador. Below (L to R): David Hornidge, Ashlee Cunsolo, Sean McGrath, and Christl Verduyn at the event.



## RSC PACIFIC INAUGURAL EVENT

January 31, Peter Wall Institute for Advanced Studies, UBC

RSC Pacific showcases the work of newly-elected Fellows and College Members.



## COLLEGE WINTER PLANNING MEETING

February 12-13, Vintage Conservatory, Toronto

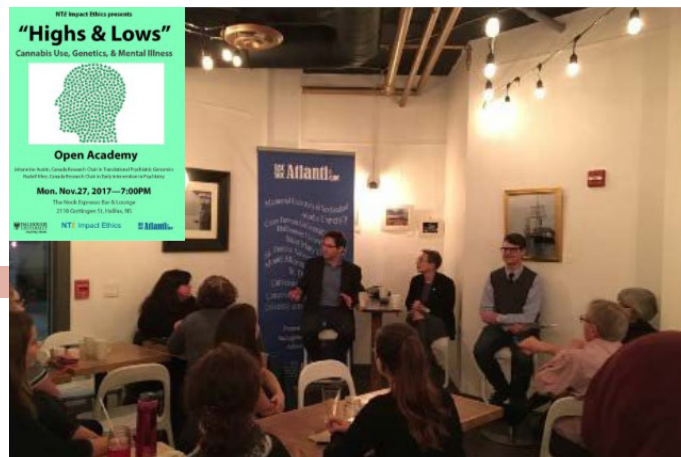
The College Winter Planning Meeting was followed by a dinner hosted by President-Elect Joanna Quinn. (L to R): Joanna Quinn, Tony Calcagno, Rachel Birnbaum, Cynthia Milton, Nigel Raine, Catherine Beauchemin, Russel MacDonald, Fuyuki Kurasawa, Graeme Auld, Reem Bahdi



## CANNABIS HIGHS AND LOWS

November 27, The Nook Espresso Bar, Halifax

Rudolf Uher (left) and Jehannine Austin (centre) lead a Café scientifique moderated by Tim Krahn (right) on genetics, cannabis use, and mental illness.



## THE LANGUAGE OF / LA LINGVO DE ESPERANTO

**November 29, Khyber Centre for the Arts, Halifax**

"No such thing as a small language: An evening in literary translation with Sebastian Schulman," at the Khyber Centre for the Arts.



## WINNIPEG ART GALLERY PERFORMANCE

**November 22, Winnipeg Art Gallery, Winnipeg**

A musical performance by Leanne Betasamosake Simpson and a reception at the Winnipeg Art Gallery is held preceding the Celebration of Excellence. (L to R): Reem Bahdi, Joanna Quinn, Cynthia Milton, George Belliveau, Laura Loewen, Philippe Tortell, Daniel Bernstein, Ian Mauro, Fuyuki Kurasawa.



## WAVE 150

**October 28, Halifax/Montreal/London/Winnipeg/Vancouver**

The WAVE 150 was a series of events transpiring across the country, with each iteration exploring questions of the constitution. Below, David Suzuki speaks at the Vancouver session.



## TURTLE LODGE

**November 22, Turtle Lodge, Sagkeeng First Nation**

Preceding the Celebration of Excellence, a contingent from the RSC is warmly welcomed at the Turtle Lodge, an International Centre for Indigenous Education and Wellness.



## FRONTIERS OF SCIENCE

**November 2-5, 2017, Okinawa, Japan**

The RSC, together with Canadian Institute for Advanced Research and the Japan Society for the Promotion of Science collaborate to hold a Frontiers of Science symposium in Okinawa, Japan.



## CANADA BEFORE CONFEDERATION: EXHIBITION OF MAPS

**October 17-December 15, Mount Allison University**

RSC Atlantic hosts an Open Academy exhibition of maps.



# LOOKING BACK: CELEBRATION OF EXCELLENCE 2017

The RSC was honoured to bring the 2017 Celebration of Excellence to Winnipeg, Manitoba. During November 23-26 the RSC inducted 100 new Fellows and 71 new Members of the College of New Scholars. The Society also honoured this year's 12 winners of our Medals and Awards.

## BIG THINKING BREAKFAST

The Big Thinking Breakfast, organized in cooperation with The Canadian Federation for the Humanities and Social Sciences, featured Dr. Blair Stonechild, a faculty member at First Nations University of Canada in Regina. Dr. Stonechild's lecture spoke to the importance of Indigenous knowledge and spirituality for the future of academia.



## OPENING CEREMONY AND ART BATTLE

The Opening Ceremonies were held at the Winnipeg Art Gallery, and included a live art battle,

a tour of the gallery, and a hoop dance performance from Shanely Spence.



## ANNUAL GALA

The events concluded with the Annual Gala, which hosted dozens of universities and over 400 attendees at the Canadian Museum for Human Rights. Together we celebrated the abundance of talent, knowledge and innovation in Canada. And there was dancing!



## SPONSORS

The RSC would like to thank all of the institutions whose support made the 2017 Celebration of Excellence such a memorable occasion. In particular, special thanks to the University of Manitoba, the COE 2017 Presenting Sponsor.



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HUMANITIES AND  
SOCIAL SCIENCES

Winnipeg

TOURISM  
WINNIPEG

Council of Canadian Academies  
Conseil des académies canadiennes

# CELEBRATION OF EXCELLENCE & ENGAGEMENT 2018



In addition to our induction and awards ceremonies, Academy meetings and

presentations by new Members, we will be celebrating, collaborating and sharing in new and exciting ways.

Beginning with a symposium hosted by Dalhousie University, this year's programme includes a new Festival of Ideas that encourages all Members to share their work; Academy cafés, which highlight the work of the incoming class of 2018; a morning run/walk along the harbour boardwalk; speed meetings; engaging lectures; a tour of Pier 21; pub night at the Garrison Brewery; and a Kitchen Party Ceilidh.



Alice Aiken, Vice President, Research, Dalhousie University invites the RSC to Halifax for the 2018 Celebration of Excellence & Engagement.

## ENHANCEMENTS TO THIS YEAR'S PROGRAMMING

### PUB NIGHT • THURSDAY, 9:00PM, GARRISON BREWERY

For a cold, locally-brewed pint among old and new friends after the Opening Ceremonies, the Garrison Pub—immediately across the street from Pier 21—will open its doors exclusively to the RSC community. (One free sample is included.)

### G7 BREAKFAST • FRIDAY, 7:30AM, HALIFAX BALLROOM

How can the RSC leverage the outcomes of the successful G7 Research Summits on *Arctic Sustainability* and *Our Digital Future* to help build a better world in 2019 and beyond?

### MENTORSHIP AND SPEED MEETING • FRIDAY, 9:30AM, HALIFAX BALLROOM

These engagement opportunities feature structured discussion followed by a set of one-on-one conversations that are refreshed every few minutes, enabling new Members and Fellows to meet as many new colleagues as possible.

### ROMANOWSKI BREAKFAST • SATURDAY, 7:30AM, NOVA SCOTIA BALLROOM

The Romanowski Breakfast lecture will feature 2017 Romanowski Medal Winner Keith Hipel and a panel discussion.

### FESTIVAL OF IDEAS • SATURDAY, 1:00PM, SABLE BALLROOM

The *Festival of Ideas* is a presentation session available to all Members who wish to present their research or to explore the research of others. Interested Members reserve a time slot and a physical space to present their work through a visual display or multimedia presentation.

## NEW MEMBER VIDEOS

Keep an eye out Friday and Saturday for a rolling stream of one-minute videos that tell the stories of recent inductees! The videos will be played in the Oxford Room on the main level.



# CELEBRATION OF EXCELLENCE & ENGAGEMENT 2018: DAY 1 AND 2

THURSDAY, NOVEMBER 15, 2018		
8:00am - 8:30am	Symposium Registration	Dalhousie University
8:30am - 4:30pm	200 Years on the Atlantic: A multidisciplinary symposium hosted by Dalhousie University	Dalhousie University
4:30pm - 5:00pm	Shuttles from Dalhousie University to Pier 21	
5:00pm - 6:00pm	Private Tour of Pier 21 Museum <i>The Museum's guides will take guests through the exhibits</i>	Pier 21
5:30pm - 6:00pm	Orientation Session for New Members of the College <i>*New College Members Only*</i>	Pier 21
6:00pm - 7:30pm	Presentation of New Members of the College <i>College Members are officially welcomed into the Society</i>	Pier 21
7:30pm - 9:00pm	Opening Ceremonies <i>Featuring speeches, entertainment, and a complimentary drink</i>	Pier 21
9:00pm - 12:00am	Pub Night <i>The Garrison Brewery will open its doors exclusively to the RSC community, includes a complimentary sample</i>	Garrison Brewery

FRIDAY, NOVEMBER 16, 2018		
6:00am - 7:00am	Harbourfront Run <i>A fresh air jaunt along the boardwalk and Point Pleasant Park</i>	Hotel Lobby (Café)
7:30am - 9:00am	G7 Breakfast: Arctic and Digital Futures <i>Leveraging outcomes from our successful G7 Research Summits featuring Merritt Turetsky and Ian Mauro</i>	Sable Ballroom
9:30am - 12:00pm	Mentorship and Speed Meetings <i>Structured discussion enabling Members to meet as many new friends as possible</i>	Halifax Ballroom
12:00pm - 1:30pm	Lunch and Networking <i>Continuing discussions from the speed meetings</i>	Halifax Ballroom
1:30pm - 2:00pm	Induction Orientation for New Fellows <i>*New Fellows Only*</i>	Nova Scotia A
2:00pm - 5:00pm	Induction of New Fellows	Nova Scotia Ballroom
5:00pm - 6:00pm	Induction Reception <i>Featuring speeches, entertainment, and a complimentary drink</i>	Nova Scotia Ballroom
	Dinner on your own	

## CELEBRATION OF EXCELLENCE & ENGAGEMENT 2018: DAY 3 AND 4

SATURDAY, NOVEMBER 17, 2018		
6:00am - 7:00am	Harbourfront Run <i>An opportunity for fresh air along the boardwalk and Point Pleasant Park</i>	Hotel Lobby (Café)
7:30am - 9:00am	Romanowski Breakfast <i>"Energy Use and Climate Change" by Keith Hipel</i>	Sable Ballroom
9:00am - 10:30am	Medal & Awards Ceremony	Halifax Ballroom
9:00am - 10:30am	College Programming <i>An opportunity for College members to discuss next steps for the RSC</i>	Acadia Room
9:00am - 10:30am	Free time: Explore Halifax, Visit the Halifax Seaport Farmer's Market / Book an appointment at Interlude Spa within the Marriott	
11:00am - 1:00pm	RSC Presentation Cafés <ul style="list-style-type: none"> <li>Humanities, Social Sciences, and Arts</li> <li>Science, Engineering, and Health</li> </ul> <i>New members share their work in six-minute "Lightning Talks"</i>	<ul style="list-style-type: none"> <li>Annapolis Room</li> <li>Acadia Ballroom</li> </ul>
1:00pm - 3:00pm	Festival of Ideas <i>Presentation session for RSC members to share their work</i>	Sable Ballroom
3:00pm - 4:30pm	Annual General Meeting <i>RSC members formally review finances, consider proposed By-law changes, and elect the Board of Directors</i>	Acadia Room
3:00pm - 4:00pm	Information session about preparing RSC nominations	Annapolis Room
6:30pm - 9:00pm	RSC Gala <i>An evening of fine dining and celebration of the year's achievements</i>	Nova Scotia Ballroom
9:00pm - 12:00am	Kitchen Party Cèilidh <i>Time to dance!</i>	Halifax Ballroom

SUNDAY, NOVEMBER 18, 2018		
9:00am - 12:00pm	Academy and College Meetings <ul style="list-style-type: none"> <li>Academy of the Arts and Humanities</li> <li>Academy of Social Sciences</li> <li>Academy of Science</li> <li>College of New Scholars</li> </ul>	<ul style="list-style-type: none"> <li>Annapolis Room</li> <li>Sable D</li> <li>Sable A, B, &amp; C</li> <li>Acadia Room</li> </ul>

### SPONSORS

The RSC would like to thank all of the institutions whose support make the 2018 Celebration of Excellence & Engagement possible. In particular, special thanks to Dalhousie University, the COEE 2018 Presenting Sponsor.



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UNIVERSITY 2018

## ACADEMY OF THE ARTS & HUMANITIES

### DIVISION OF HUMANITIES



**BECK, Hans – Department of History and Classical Studies, McGill University**

Hans Beck's path-breaking work has led to major innovations in the study of ancient Greek and Roman political culture. Beyond the Mediterranean World, he is an active agent in the development of international research networks in comparative history, including comparisons with ancient China. His prolific output informs contemporary debates about local and global paradigms, the relationship between ethnicity and federalism, and the modes of economic cooperation in federal systems.



**BERGEN, Doris – Department of History, University of Toronto**

Doris Bergen is an internationally recognized Holocaust historian. Using an integrative approach, viewing the Holocaust and war as intertwined and considering Jews and non-Jews as victims, she reveals the dynamic contagion of extreme violence. Her innovations established Christianity as a key component of Nazi antisemitism; defined the importance of ethnic Germans in Eastern Europe to anti-Jewish policies; and demonstrated the significance of gender and sexuality in the Holocaust.



**BLAKE, Raymond – Department of History, University of Regina**

Raymond B. Blake's innovative historical research has opened up new ways of thinking about Canada. His scholarship on federalism, social welfare, and national identity has demonstrated that public policy is shaped by the demands of all people to participate equitably in Canada's social and economic citizenship. He is the author of several acclaimed monographs explaining how citizenship has been a powerful force in either creating political crises or solving them.



**GICK, Bryan – Department of Linguistics, The University of British Columbia**

Bryan Gick's pioneering work uncovering the basic mechanisms of spoken language is remarkable for its originality, impact and breadth. He has made surprising discoveries in multimodal perception, advanced theories of movement control, developed applications for ultrasound imaging in language teaching and clinical intervention and co-developed ArtiSynth, the state-of-the-art biomechanical modelling platform for head/neck/face simulation, applied in areas from surgical planning to telecommunications and computer animation.



**JUDGE, Joan – Department of History, York University**

Joan Judge has reshaped understanding of modern Chinese history through methodologically innovative studies in Chinese print culture, periodical studies, and women's history. Prominent among her publications are three books: *Print and Politics: 'Shibao' and the Culture of Reform in Late Qing China*; *The Precious Raft of History: The Past, the West, and the Woman Question in China*; and *Republican Lens: Gender, Visuality, and Experience in the Early Chinese Periodical Press*.



**JUSTICE, Daniel – The Institute for Critical Indigenous Studies and the Department of English Language and Literatures, The University of British Columbia**

Daniel Heath Justice is a leading expert in contemporary Indigenous Studies, whose influence extends across North America, the Pacific Rim, and Europe. His publications in kinship, animal studies, sexuality, and literary history are prolific and wide-ranging. Together with his creative work, his scholarship demonstrates a gift to explicate complex social and cultural problems in lucid and accessible language, and it is characterized by a strong sense of mission and responsibility.



**KINGWELL, Mark – Department of Philosophy, University of Toronto**

Mark Kingwell is one of Canada's leading philosophers and art critics. In his work, he covers topics such as citizenship, happiness, politics, art, architecture, and music. He argues that justice depends not only on political institutions but also on how we conduct civic discourse, the built environments we inhabit, and the aesthetic worlds we create together. Kingwell is also celebrated for bringing philosophy into the public sphere.



**KLUGE, Eike-Henner – Department of Philosophy, University of Victoria**

Eike-Henner Kluge is an internationally recognized expert in biomedical and health information ethics. The first recognized expert witness in medical ethics in Canada, he has presented invited testimony to Royal Commissions and Parliamentary Committees and consulted with Health Canada and provincial Ministries of Health. He is the lead author of the International Medical Informatics Association's Code of Ethics (translated into nine languages) and wrote the accompanying Handbook of Ethics.



**KOOISTRA, Lorraine Janzen – Department of English, Ryerson University**

Lorraine Janzen Kooistra is internationally acclaimed for her pioneering research on the complex relationships between pictures and words in nineteenth-century print culture. Her innovative methodology and collaborative, interdisciplinary approach have advanced illustration studies and demonstrated the fundamental utility of bibliographical and textual studies in literary criticism. Her digital editions, searchable for both visual images and printed text, are models of interdisciplinary practice and open-access public scholarship in the humanities.



**LANGFORD, Martha – Department of Art History, Concordia University**

Martha Langford is an internationally renowned photographic scholar whose theories on photography and memory have influenced interdisciplinary research in Europe, North America, and Australia. Closer to home, Dr. Martha Langford is a leading contributor to the study of the visual arts in Canada, through her publications, editorial contributions, leadership of the Gail and Stephen A. Jarislowsky Institute for Studies in Canadian Art, and foundation of the Canadian Museum of Contemporary Photography.



**MENN, Stephen – Department of Philosophy, McGill University**

Stephen Menn is known for his profound understanding of all areas of ancient philosophy, but especially for his transformative solution to the problem of the aim of Aristotelian metaphysics. He has written the first commentary on the overall argument of Aristotle's *Metaphysics* since the Canadian Joseph Owens in 1951. He also works on Arabic and Latin medieval philosophy, and on history and philosophy of mathematics, modern as well as ancient.



**PANOFSKY, Ruth – Department of English, Ryerson University**

Ruth Panofsky is a leading, authoritative scholar of the history of publishing and authorship in Canada and Canadian Jewish literature. She is the chief specialist on Macmillan of Canada and novelist Adele Wiseman. Panofsky's pioneering studies of Canadian women and Jewish writers have advanced new research fields, and her impeccable textual scholarship has made the work of novelists and poets available to a wide audience in print and digital editions.



**ROSS, Catherine – Faculty of Information and Media Studies, Western University**

Catherine Sheldrick Ross is an interdisciplinary scholar whose work on reference and on recreational reading has made an impact on the way that librarians develop collections and advise users. Her interview-based research with avid readers has led to discoveries about how pleasure-readers choose, experience, and value leisure reading in the context of their everyday lives. Significant publications include *Alice Munro: A Double Life* (1992), *The Pleasures of Reading* (2014), and *Reading Still Matters* (2018).



**UPITIS, Rena – Faculty of Education, Queen's University**

Rena Upitis is a dynamic arts education scholar of international stature. Driven by a desire to build deep connections with the natural world, her work involves experiential learning, research, and social activism. Taking a holistic approach to human development, she has cultivated many spheres of expertise: arts education, digital literacy, mathematics education, curriculum development, sustainability studies, and architectural design. Her contributions have influenced educational practices in North America and globally.

#### DIVISION DES LETTRES ET DES SCIENCES HUMAINES



**GERVAIS, Bertrand – Département d'études littéraires, Université du Québec à Montréal**

Bertrand Gervais is the Canada Research Chair in Digital Art and Literature, as well as the Director of Laboratory NT2. Founder and director (1999-2015) of *Figura*, Centre de recherche sur le texte et l'imaginaire, he is a full professor in the Department of Literary Studies at the Université du Québec à Montréal. He has published essays on reading, the imagination, and digital technology, as well as novels.



**NARBONNE, Jean-Marc – Faculté de Philosophie, Université Laval**

Jean-Marc Narbonne is an internationally renowned expert in the history of classical thought and the Platonic tradition in particular. His research on the critical dimensions of antiquity have led to ultra-innovative hypotheses on the transition from Greek to modern philosophies, and particularly the emergence of democratic models in Western thinking.



**ROUTHIER, Gilles – Faculté de théologie et de sciences religieuses, Université Laval**

Gilles Routhier is an internationally renowned specialist in history, teaching, hermeneutics, and the reception of the Second Vatican Council. Professor Routhier's research, publications, ground-breaking theoretical thinking, international recognition, as well as his scientific leadership, both nationally and internationally, have made him a first-class expert in ecclesial institutions in the second half of the 20th century.



**TURGEON, Laurier – Département des sciences historiques, Université Laval**

Professeur Laurier Turgeon is an internationally renowned expert whose original approaches in cultural heritage have helped develop a new research field, that of hybridized heritage. His work has enabled the re-theorization of the study of heritage in light of intercultural studies. Generally designed as a form of transmission within the same culture, Laurier Turgeon explores the many mechanisms of building heritage through the exchanges and interactions between different cultures.

*DIVISION OF ARTS*



**BURLEY, Robert – School of Image Arts - Ryerson University**

The photographs of Robert Burley have had a profound influence on the way we understand the intersection of the built and natural environments. His many exhibition and publications have changed the way in which artists, architects, designers and urban ecologists analyze the relationship between nature and the city. He is held in equally high esteem by researchers in Canada who have benefited greatly from the visual resources he has established.



**SYCH, Paul – Department of Design, York University**

With a renowned career of graphic expression spanning three decades, Paul Sych continues to create groundbreaking works in both digital and print that range across typography, branding, and motion design. His work has appeared in over 130 books and publications worldwide, and since being appointed to the Department of Design at York University, he has been celebrated with over 100 international art direction, design, and typography awards.



**BUTTERFIELD, Benjamin – School of Music, University of Victoria**

An internationally recognized tenor, Benjamin Butterfield has performed in opera concert and recital throughout North America, Europe, the Middle East, Asia and New Zealand. His repertoire spans music from the renaissance to the present day, and he has performed in many of the world's most recognized venues with the world's finest ensembles and conductors. He is featured on over 30 CD recordings, several DVDs and regularly on CBC Radio.



**YOON, Jin-me – Department of Contemporary Arts, Simon Fraser University**

Jin-me Yoon is a Korean-born Canadian contemporary artist-researcher. Her early photographic work unpacked dominant discourses and stereotypical assumptions about citizenship, nationhood, culture, gender, and race. Expanding her practice to include video and installation, Yoon's ongoing work utilizes a transnational lens to witness and consider local histories, environments, identities and bodies in the context of entangled and interdependent global relations. Her work has been presented in over 180 exhibitions and is held in 17 public collections in Canada and internationally, including the National Art Gallery, Royal Ontario Museum, Vancouver Art Gallery and Seoul Museum of Art.



**HLOWNIA, Thaddeus – Department of Fine Arts, Mount Allison University**

Thaddeus Holownia is a Canadian photographer, letterpress printer, publisher, and university fine arts professor of the highest caliber. His retrospective *The Nature of Nature: The Photographs of Thaddeus Holownia 1976-2016* mounted by the Art Gallery of Nova Scotia, summarizes Holownia's interest in observing 'the natural' through serial studies of diverse subjects.



**BANSAL, Pratima – Richard Ivey School of Business, Western University**

Pratima (Tima) Bansal is a pre-eminent, globally-known scholar of business sustainability. Her pioneering scholarship and extensive publication record helped establish the field of business sustainability. She is among the most cited scholars in the field and has received some of the highest international honours from her peers. Not only is she deeply committed to advancing sustainability research, she is also deeply committed to impacting business practice through research, thereby contributing to the social and environmental prosperity of future generations.



**DEBER, Raisa – Institute of Health Policy, Management and Evaluation, University of Toronto**

Raisa Deber is internationally-recognized as a leading expert in health policy. Her evidence-based conceptual frameworks have had a direct impact on how health policy is made at the provincial, national, and international levels. Deber is also renowned for her transdisciplinary work on the distribution of health expenditures, patients' preferred roles in medical decision-making, and the public-private mix in financing and delivering health care.



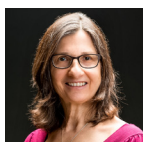
**BELL, Trevor – Department of Geography, Memorial University of Newfoundland**

Trevor Bell is a multidisciplinary geographer whose current work focuses on climate change adaptations and human-environment interactions. His pioneering research on climate variability and change in Inuit Nunangat has had significant scholarly, community and policy impacts. He has twice received the Arctic Inspiration Prize for knowledge-to-action plans that benefit Arctic Peoples. His most recent partnership - SmartICE - was recognized by the United Nations for its novel climate solution.



**GILES, Wenona – Department of Anthropology, York University**

An anthropologist at York University, Wenona Giles' path-breaking scholarship has made significant contributions to the anthropologies of gendered migration, displacement and war. Her groundbreaking work on the gender relations of militarization and conflict and her research and engaged scholarship on long term forced migration ranks among the best in its field and has consistently helped to open doors to new scholarly explorations through synergistic laboratory like collaborations.



**BYERS, E. Sandra – Department of Psychology, University of New Brunswick**

E. Sandra Byers is a renowned clinical psychologist who is one of the most important, influential, and esteemed human sexuality researchers world-wide. Her extensive scholarly contributions have transformed understanding of sexual well-being, including of members of vulnerable groups. She is widely acknowledged as the word expert on sexual satisfaction. Her work has not only transformed her field of research, it has enhanced the lives of thousands of people.



**GRAHAM, Janice – Department of Pediatrics, Dalhousie University**

Janice Graham is an internationally recognized medical anthropologist who has carved new paths into the deep ethnography of science, health technologies and medicine. Interested in the cultural, technical and moral tensions of health regulation, she studies the evidence for safety and effectiveness of emerging biotechnologies, and the commercialization of publicly funded health innovation. She is currently working on transparency, openness and trust in global vaccines research.



**DAUVERGNE, Peter – Department of Political Science, The University of British Columbia**

Peter Dauvergne is a world-leading scholar of global environmental politics. His pioneering research on consumption, corporations, and social movements has significantly advanced the theoretical understanding of the causes and consequences of global environmental change. Extensive field-based research in the Asia-Pacific has further unlocked key insights into the transnational causes of tropical deforestation. His books have received multiple international awards and been widely translated.



**LAJOIE, Susanne – Department of Educational and Counselling Psychology, McGill University**

Susanne Lajoie's groundbreaking research merges cognitive science with leading edge computer technology, and helps stimulate learning in social and life sciences. Her innovative technology environments encourage independent thinking, reflection, and the self-management of learning and emotions. Dr. Lajoie's international research on collaborative learning links people from different cultures and activates life-long learning skills.



**PAUL, T.V. – Department of Political Science, McGill University**

T.V. Paul focuses on puzzles and paradoxes in International Relations. A major advocate of eclecticism and building bridges across theoretical paradigms, his works have had a significant impact on the development of policy in the areas of peacebuilding, security planning and nuclear arms control. The concepts he pioneered, 'asymmetric conflicts', 'soft balancing', 'complex deterrence', 'geostrategic curse', and 'status accommodation' have become part of the lexicon of international relations theory and foreign policy.



**PRATT, Jay – Department of Psychology, University of Toronto**

Jay Pratt is internationally renowned for his ground-breaking studies on how humans allocate attention across the visual field and how certain types of visual information are prioritized by the brain. His research has catalyzed several new lines of research worldwide, including how actions bias activity in visual pathways, how concepts and symbols generate shifts of visual attention, and how much volitional control can be exerted over reflexive attentional processes.



**STEWART, Sherry H. – Departments of Psychiatry and Psychology & Neuroscience, Dalhousie University**

Sherry Stewart has made significant, internationally-reputed contributions to the understanding of, and intervention with, anxiety and addictions. She has relentlessly pursued identifying the basic personality, motivational, and situational factors underlying the proclivity to develop excessive anxiety and/or addictive behaviors (e.g., misuse of cigarettes, alcohol, cannabis, prescription drugs, and gambling) using sophisticated social science lab, field, and intervention approaches. She has studied adults and adolescents in mainstream and Aboriginal communities.



**STOCKWELL, Timothy – Canadian Institute for Substance Use Research, Department of Psychology, University of Victoria**

Timothy Stockwell is internationally recognized for his contributions to delineating substance use patterns, calculating costs to health, and both researching and advocating for prevention and treatment strategies that reduces these costs. He has published over 250 articles, 69 chapters, 8 books, 12 monographs and 97 reports. His research has led to the production of WHO alcohol measurement guidelines, and the introduction of new policies in Australia, New Zealand, the UK and Canada.



**STUART, Heather – Department of Public Health Sciences, Queen's University**

Heather Stuart, the Bell Mental Health and Anti-Stigma Research Chair at Queen's University, is a social-epidemiologist and award-winning researcher who has developed world-recognized translational research to reduce mental illness-related stigma. Coupled with novel partnerships with professional, governmental, and private enterprises, her research has allowed for the development, implementation, and evaluation of best practices designed to reduce stigma, promote recovery, social equity, and to influence mental health policy.



**UNGAR, Michael – School of Social Work, Dalhousie University**

Michael Ungar's research on human resilience has been internationally recognized for broadening our understanding of how culture influences the relationship between social environments and the protective processes associated with positive child and adult development. The multi-country studies of resilience among stressed populations that he has led have been the basis for a global program of knowledge translation that is helping to inform both social policies and clinical interventions.



**VAVER, David – Osgoode Hall Law School, York University**

David Vaver is one of the world's preeminent scholars of intellectual property law. His pioneering work on "user rights" and the public interest has brought fairness and balance to Canada's intellectual property system. The prolific author of many acclaimed books, edited collections, and peer-reviewed articles, his scholarship is relied on as persuasive authority by courts and lawmakers, while his teaching and mentorship have nurtured many leading minds in the field.



**WOLFE, David – Faculty of Education, Western University**

David Wolfe is a psychologist specializing in issues affecting children and youth. He has pioneered new approaches to preventing many societal youth problems such as child abuse, bullying, relationship violence, and substance abuse through universal education programs. His Fourth R program is taught in over 5000 schools in Canada and the US, and has been identified as a promising violence prevention strategy by numerous reviews of evidence-based programs for youth.



**AMIRAUX, Valérie – Département de sociologie, Université de Montréal**

Valérie Amiraux is an internationally renowned expert in Muslim minorities whose presence in certain societies (such as Germany, France, Great Britain, Italy, Quebec) is controversial. Her research, which draws on qualitative methodologies, have helped introduce critical race studies in sociology around religious facts, as well as support a theorization of the relationship between pluralism and radicalization.



**COHENDET, Patrick – Département des affaires internationales, HEC Montréal**

Patrick Cohendet is an internationally renowned researcher in the areas of the knowledge economy and innovation management. In particular, he has helped demonstrate the importance of relationships, within organizations, between formal hierarchical structures and informal mechanisms (knowledge communities), which are the foundation of the dynamics of innovation. His recent work focuses on the borders between innovation management and the geographical economy. It aims to highlight the features of creative territories (generativity, attraction, resilience) by demonstrating the importance of intermediary collaborative platforms between informal firms and communities.



**HAFSI, Taïeb – Département de management, HEC Montréal**

Taïeb Hafsi has made world-class contributions in five aspects of strategic management: the management, strategy, change, governance, and social performance of complex organizations like diverse companies, public companies, Crown corporations, major foundations, non-profit organizations, and nations. His research is original, pioneering, inspiring, and significant in light of its scope and depth. His research findings have earned him substantial international recognition.



**WARREN, Jean-Philippe – Département de sociologie et anthropologie, Concordia University**

Jean-Philippe Warren, winner of the 2015 Governor General's Award, is a prolific writer who has established himself nationally and internationally. His work has fostered a better comprehension of Québec's evolution in a globalized world by highlighting the tensions between nationalism, liberalism and democracy.

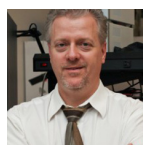
## ACADEMY OF SCIENCE

### DIVISION OF APPLIED SCIENCES AND ENGINEERING



**AL-HADDAD, Kamal – Département de génie électrique, École de Technologie Supérieure**

Dr. Al-Haddad is a pioneer in the field of power electronics and energy conversion systems. An internationally recognized expert, he has advanced the field by proposing novel power electronics converter topologies and digital control techniques. He has made tremendous impact in innovative product designs by transferring new technologies from his research lab to aerospace, transportation, telecommunications and electric utility industries in Canada and throughout the globe.



**BERINI, Pierre – School of Electrical Engineering and Computer Science, University of Ottawa**

Pierre Berini has made highly innovative and pioneering contributions to nanophotonics, particularly to the fields of surface plasmons and metamaterials. His work on surface plasmon waveguides and associated integrated structures helped define the field and set directions for research globally. His work on active surface plasmons established plasmonic amplifiers as an application, and his telecom devices and (bio)chemical sensors were adopted by industry.



**BOTTON, Gianluigi** – Department of Materials Science and Engineering, McMaster University

Professor Gianluigi Botton is internationally recognized for his groundbreaking research on the fundamental aspects of solid materials using electron microscopy; he pioneered the acquisition of spectra from individual atoms in oxides and inter-metallic compounds, and critically advanced the study of plasmonics in metals. He championed and presided over the development of the Canadian Centre for Electron Microscopy, now considered amongst the most successful such facilities worldwide.



**ELMARAGHY, Hoda** – Department of Mechanical, Automotive and Materials Engineering, University of Windsor

Hoda ElMaraghy is a world leader in manufacturing systems. Her inspiring research opened up new research fields in Co-Evolution and Co-Development of Products and Manufacturing Systems using principles of Natural Evolution. Her vast contributions to modern manufacturing systems paradigms, flexibility and changeability changed the way they are designed and operated. Her acclaimed publications and pioneering research make her the pre-eminent scholar of manufacturing systems research in Canada and internationally.



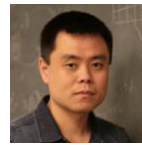
**FOSTER, Stuart** – Sunnybrook Research Institute and Dept of Medical Biophysics, University of Toronto

Stuart Foster is the world leader in micro-ultrasound. He has developed high frequency ultrasound instrumentation and has founded VisualSonics Inc - the premier supplier worldwide of micro-ultrasound and photoacoustic scanners. Dr. Foster has applied micro-ultrasound to solve clinical problems in ophthalmology, dermatology and neurosurgery. He has also pioneered the use of ultrasound for preclinical imaging, particularly in the mouse where it is now essential for evaluation of the heart, embryos and cancer models.



**OXLAND, Thomas** – Department of Mechanical Engineering & Orthopaedics (joint), The University of British Columbia

Thomas Oxland is an international authority in the biomechanical behaviour of the human spine. His seminal research work includes the biomechanics of the normal, degenerated, and injured spine, spinal cord injury, spinal and other orthopaedic implants and surgical techniques. He was a key research and development engineer for novel spinal implants that remain in clinical use today, more than twenty-five years after the initial surgeries.



**WANG, Zhou** – Department of Electrical and Computer Engineering, University of Waterloo

Zhou Wang is internationally recognized for his ground-breaking work on perceptual image quality assessment and processing. His award-winning seminal paper has created a paradigm change in the field, and has resulted in the most widely used approach for visual quality assessment. Dr. Wang is a Fellow of the Institute of Electrical and Electronics Engineers and a 2014 recipient of the NSERC Steacie Memorial Fellowship.



**WHEATER, Howard** – College of Engineering, University of Saskatchewan

Howard Wheeler is one of the world's leading hydrologists. His many contributions to the field of hydrology represent significant breakthroughs that have become fundamental to the practice of hydrology today. A Canada Excellence Research Chair at the University of Saskatchewan, Professor Wheeler is a Fellow of the Royal Academy of Engineering UK and the American Geophysical Union. In 2006, he won the Prince Sultan bin Abdulaziz International Prize for Water.



**YAO, Jianping** – School of Electrical Engineering and Computer science, University of Ottawa

Jianping Yao, a Distinguished University Professor and University Research Chair at the University of Ottawa, is a world leader in Microwave Photonics. With over 600 refereed publications, he has pioneered various developments in microwave photonics. Through his distinguished career, he has also trained over 80 research students, established close collaboration with industry and played an active role in various professional societies. Prof. Yao is a Fellow of IEEE, the Optical Society of America, and the Canadian Academy of Engineering.



**LAPRISE, René – Département des sciences de la Terre et de l'atmosphère, Université du Québec à Montréal**

A physicist and expert in atmosphere dynamics, René Laprise contributes to the understanding and high-resolution modelling of the atmospheric component of the climate system. His work on climate change modelling and its effects on resource availability has led to the development of concrete adaptation strategies. He acted as Lead Author of the IPCC Fourth Assessment Report that was awarded the 2007 Nobel Peace Prize.



**LEAVITT, Peter – Department of Biology, University of Regina**

Peter Leavitt has advanced our understanding of how climate change and human activities interact to degrade Canada's surface waters. A global pioneer in the field of paleolimnology, Leavitt has investigated how lakes are impacted by global warming, hydrological variability and societal development associated with food production, resource extraction and urbanization. By combining whole-lake studies with innovative fossil analyses, Leavitt's research has led to improved strategies to protect aquatic ecosystems.



**LEWIS, Marlon – Department of Oceanography, Dalhousie University**

By combining insightful theory with ground-breaking measurements of light in the oceans, Marlon Lewis has pioneered our ability to remotely observe, describe and understand pelagic ecosystems. Additionally, his leadership of the development of satellite oceanography and its commercialization has substantially furthered ocean observation technology. Professor Marlon Lewis is the very model of an influential innovator and a preeminent interdisciplinary oceanographer.



**POMEROY, John – Department of Geography and Planning, University of Saskatchewan**

John Pomeroy is the world's most cited snow hydrologist. A Canada Research Chair in Water Resources and Climate Change, Dr. Pomeroy's career contributions have changed the field of hydrology; his landmark studies on snow transport and distribution, snow cover energy balance, snow cover evolution, melt, and runoff have defined current understandings of the science of snow. An AGU Fellow, he won the Canadian Geophysical Union's highest honour, the J. Tuzo Wilson Medal, in 2017. He currently directs the world's largest university-led freshwater research programme—Global Water Futures: Solutions to Water Threats in an Era of Global Change for the Canada First Research Excellence Fund.



**SHOTYK, William – Department of Renewable Resources, University of Alberta**

William Shotyk has pioneered the use of peat bogs to decipher the global history of metal pollution and environmental changes during the last 15,000 years. His painstaking measurements of the concentrations of lead and its isotopes as well as other metals in dated peat cores and ice layers deposited during the Post-Glacial period currently represent an international reference against which other studies on metal paleo-pollution are calibrated.



**ARCHER, Stephen – Department of Medicine, Queen's University**

Stephen Archer is Professor and Head of Medicine at Queen's University and a world-renowned cardiologist and leader in several research fields, including oxygen sensing, vascular biology, and the experimental therapeutics of pulmonary hypertension and, more recently, cancer. He has made numerous discoveries that can undisputedly be considered firsts, particularly in regard to defining the roles of mitochondrial fission/fusion and metabolism in oxygen-sensing and cell proliferation.



**BLIER, Pierre – Department of Cellular and Molecular Medicine, University of Ottawa**

Pierre Blier's sophisticated and translational approaches to neuroscience and pharmacology have contributed to the identification of the neural pathways that are involved in the effects of antidepressants, to the understanding of the neurochemical processes involved in major depressive disorder, and to the improvement of its treatment. He is also a key contributor to the development of standards and policies in the field.



**BRINKMAN, Fiona – Department of Molecular Biology and Biochemistry, Simon Fraser University**

Fiona Brinkman is a world-leading bioinformatics expert who has led research efforts, including large consortiums, to tackle the global health threats posed by infectious and inflammatory diseases and antibiotic resistance. Her research and widely used open-source computational tools have led to fundamental insights into how microbes evolve, and are enabling health agencies to implement more sustainable control of infectious diseases and to preserve microbiota essential for human and environmental health.



**CHIVERS, Douglas – Department of Biology, University of Saskatchewan**

Douglas Chivers is one of the world's leading researchers in animal behaviour. An expert on predator-prey interactions, his work on how prey animals are able to assess risk is the first of its kind and has led to numerous high-impact publications. He has also developed new frameworks that apply behavioural and cognitive ecology to help address global environmental challenges. In 2016, Chivers was elected Fellow of the Animal Behaviour Society.



**DEDHAR, Shoukat – Department of Biochemistry and Molecular Biology, The University of British Columbia**

Shoukat Dedhar's pioneering work in the field of cell adhesion has uncovered the molecular basis of how cells in the body adhere to the surrounding matrix and how cell adhesion regulates fundamental aspects of cellular physiology. His discovery of Integrin-Linked Kinase has generated a large body of work which has demonstrated fundamental roles of this protein in normal tissue function and pathologies such as cardiovascular dysfunction, renal failure, and cancer.



**FRANKLAND, Paul – Neurosciences & Mental Health, The Hospital for Sick Children Research Institute, University of Toronto**

Paul Frankland is recognized as a world leader in memory research. His studies have uncovered the neurobiological processes underlying how we learn, remember and, in some cases, forget. Knowledge gained from Prof. Frankland's research provides a foundation for the development of better treatments for memory-related disorders.



**IVERSON, Sara – Department of Biology, Dalhousie University**

Sara Iverson's interdisciplinary and ground-breaking research has advanced the understanding of marine animal physiological ecology; roles of fat in mammalian reproduction, survival and life history strategies; and marine animal movement and foraging ecology. She is the Scientific Director of the global Ocean Tracking Network, the world's foremost aquatic animal tracking network and a Canadian National Research Facility, which is revolutionizing the way aquatic life is studied, understood and governed under increasing environmental change.



**JHA, Prabhat – Centre for Global Health Research and Dalla Lana School of Public Health, University of Toronto**

Prabhat Jha has led pioneering epidemiological and economic studies which have established tobacco as the most important contributor to premature adult mortality and identified taxation as the most effective means to reduce tobacco consumption (enabling the first global treaty on health). Prof. Jha has done outstanding research on the reliable assessment of causes of death globally including the Million Death Study of a random sample of all deaths in India since 2001.



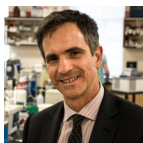
**JOSSLYN, Sheena – Neurosciences & Mental Health, The Hospital for Sick Children Research Institute, University of Toronto**

Sheena Josselyn is a world leader in investigating how the brain encodes, stores and uses information. Her studies break new ground and have changed the way the field of neuroscience views memory. The fundamental insights gained by Prof. Josselyn's research into basic memory processes in rodents may translate into superior ways of treating - or even preventing - devastating human brain disorders.



**MANSFIELD, Shawn – Department of Wood Science, The University of British Columbia**

Shawn Mansfield is a world-leading authority on plant secondary cell wall biosynthesis. He is internationally recognized for his efforts linking genomics, biochemistry, and development, and using functional genomics has discovered genes critical to plant growth. His work has significant implications for the improvement of bioenergy crops and forest trees, with the potential to substantially ameliorate the anthropogenic footprint of industrial processing and mitigate atmospheric CO<sub>2</sub> release.



**MARANGONI, Alejandro – Department of Food Science, University of Guelph**

Alejandro Marangoni is one of the leading food materials scientists in the world. He has pioneered major advances in the field of lipid science, including the discovery, characterization and engineering of the nanoscale and mesoscale in triglyceride crystal networks, the establishment of the field of edible oil organogels, and the physical structuring of triglycerides to control physiological response in humans. He has published over 400 scholarly works and 40 patents.



**MEINERTZHAGEN, Ian – Department of Psychology and Neuroscience, Dalhousie University**

Ian Meinertzhagen is a pioneer in connectomics, the comprehensive mapping of brain networks. Internationally acclaimed for research on simple nervous systems, his work reveals circuit models for all brains. In *Drosophila* he has identified neurons for motion vision. Meinertzhagen's studies of photoreceptor axon growth were critical for the then nascent field of developmental neuroscience. He showed that circuits are influenced by experience, refuting a prevailing orthodoxy that insect brains are hard-wired.



**MICHNICK, Stephen – Department of Biochemistry, Université de Montréal**

Stephen Michnick has pioneered techniques and has made several discoveries in the field of molecular systems biology, the study of how ensembles of genes and their product proteins interact, determining the structures and behaviors of living cells. His methods provide spatiotemporal maps of the interactions among the thousands of proteins that make up a living cell; information that is being exploited to discover the molecular bases of normal physiological processes and the means to identify and develop strategies to correct pathological states of cells.



**O'CAMPO, Patricia – Centre for Urban Health Solutions, University of Toronto**

Patricia O'Campo is an internationally renowned Social Epidemiologist whose research focuses on the health impacts of complex urban social problems experienced by low-income populations. Through her scholarship over the past 25 years, dedicated partnerships with affected communities, and leadership at a large multi-disciplinary health research centre for over a decade, she has advanced methodologies and generated strong evidence for effective solutions to reduce urban health disparities.



**ORSER, Beverley – Department of Anesthesia and Physiology, University of Toronto**

Beverley Orser first identified how general anesthetics cause memory deficits in adults that persist long after the drugs are eliminated from the body. Her landmark papers demonstrated the cause: increased activity of extrasynaptic inhibitory neural receptors. These receptors are targets for anesthetics and other neurodepressive drugs, and, when activated, can impair memory. Her studies have fundamentally advanced our understanding of the neurobiology underlying general anesthesia and have improved patient care.



**OVERALL, Christopher – Department of Oral Biological & Medical Sciences, The University of British Columbia**

Christopher Overall is best known for proteomic method development for discovery of protease substrates *in vivo*, so establishing the field of degradomics. He has leveraged these techniques to reveal new biological roles for proteases and their aberrations in disease. In generating clinically relevant knowledge on how proteases dampen disease-fighting defence systems in inflammatory and immunodeficiency diseases to restore homeostasis, degradomics revolutionized understanding of protease function and drug targeting.



**SAUVAGEAU, Guy – Department of Medicine, Université de Montréal**

Guy Sauvageau's pioneering discoveries bear on the regulation of both normal hematopoietic stem cells (HSCs) and their malignant counterpart, the leukemic stem cells (LSCs). His seminal studies have identified both cellular factors and synthetic molecules capable of modulating HSCs self-renewal and permitting, for the first time, the *ex vivo* expansion of these cells. His research has had a direct impact on the development of better and safer treatments for leukemia.



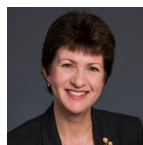
**SUISSA, Samy – Departments of Epidemiology, Biostatistics and of Medicine, Faculty of Medicine, McGill University**

Professor Suissa is an internationally renowned pharmacoepidemiologist who studies the real-world safety of medications. His landmark studies on the effects of asthma medications profoundly altered asthma management and contributed to reducing asthma mortality worldwide. His work on the risks of oral contraceptives and hormone therapy in women, and of medications used by the elderly, led to safer clinical practices. He leads the Canadian Network for Observational Drug Effect Studies (CNODES), linking over 60 Canadian scientists.



**ASCHER, Uri – Department of Computer Science, The University of British Columbia**

Uri Ascher has made fundamental contributions to scientific computing and its application in computer graphics, geophysics, image processing, robotics, semiconductors, fluid dynamics and finance. His achievements enhance our understanding of simulating constrained differential equations, Hamiltonian systems, inverse problems, PDE-constrained optimization, and multiscale methods. Ascher's mark on the practice of scientific computing is embodied in many highly cited publications, including three monographs and widely used software packages.



**PICKERING, Ingrid – Department of Geological Sciences, University of Saskatchewan**

Ingrid Pickering is one of Canada's most innovative environmental chemists and synchrotron X-ray researchers. A Canada Research Chair in Molecular Environmental Science, her work has had an international impact on understanding the effects of heavy metals on the environment and human health. Her pioneering of synchrotron technologies has led to numerous highly cited studies on topics such as mercury in fish, the connection between selenium deficiency and arsenic poisoning, and plant uptake of metals.



**DAMASCELLI, Andrea – Department of Physics and Astronomy, The University of British Columbia**

Andrea Damascelli's research on the electronic structure of solids and the development of innovative spectroscopy techniques to study and manipulate quantum materials have led to pivotal contributions to the field of condensed matter physics. From uncovering the role of spin-orbit coupling in the superconductivity of  $\text{Sr}_2\text{RuO}_4$  and Fe-based systems, to revealing charge order driven by Fermi-arc instabilities in cuprates, Damascelli's pioneering work has bolstered and refocused the international community.



**THOMPSON, A. Christopher – Canadian Institute for Theoretical Astrophysics, University of Toronto**

Christopher Thompson is one of the world's top theorists in high energy astrophysics. His seminal papers on plasma astrophysics, compact objects and planets are known for their great originality, deep physical insight and technical virtuosity. Thompson is best known for his theory of the now ubiquitous magnetars, neutron stars with very high magnetic fields, which have been spectacularly confirmed by observations of soft gamma ray repeaters and anomalous X-ray pulsars.



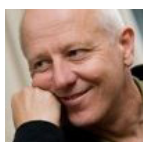
**KONERMANN, Lars – Department of Chemistry, Western University**

Lars Konermann is an international leader in the area of mass spectrometry, with a research focus on the role of proteins in health and disease. His work has helped catalyze the transformation of mass spectrometry from a simple "mass" measurement tool to a comprehensive suite of techniques for interrogating protein structure, function, folding, dynamics, binding, and aggregation. Konermann's advances have been recognized through a number of prestigious national research awards.



**VINCITER, Manuella – Department of Physics, Carleton University**

Manuella Vinciter has made precision measurements of the electroweak force, the structure of the neutron and proton, and most recently the properties of the W and Z bosons, the carriers of the electroweak force. She played a leading role in the scientific development of the 3,000 members ATLAS collaboration, which in 2012 discovered the Higgs boson.



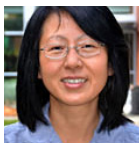
**LOCKHART, Richard – Department of Statistics & Actuarial Science, Simon Fraser University**

Richard Lockhart has made outstanding contributions to theoretical and applied statistics. His deep knowledge of analysis, probability, and statistical theory have enabled him to solve challenging problems in asymptotic distribution theory and the rigorous justification of statistical procedures. He is an international authority on goodness of fit, model assessment and model selection, and has provided clear statistical insights into signal and particle detection problems in the physical sciences.



**VINET, Luc – Département de physique, Université de Montréal**

Luc Vinet's work has a deep impact on our understanding of symmetries in physics and their mathematical description. He has made seminal contributions to gauge theories, supersymmetry, integrable systems and quantum information. He has obtained outstanding results in algebraic combinatorics by using physical models and has transformed the theory of special functions and its applications through an algebraic viewpoint.



**XU, Yunjie – Department of Chemistry, University of Alberta**

Yunjie Xu, Canada Research Chair in Chirality and Chirality Recognition, brings a rigorous physical sciences approach to decoding chiral phenomena. She advances the field by identifying important questions and finding answers by pushing methodical frontiers with the design and development of novel spectroscopic tools. Her profound contributions to uncovering stereospecific interactions underlying chirality recognition events, central to the biochemistry of life, have made her a world leader in chirality research.

## INTERNATIONAL FELLOWS



**GREEN, Douglas R – Department of Immunology, St. Jude Children's Research Hospital**

Douglas R. Green is an internationally recognized, highly cited scientist who has made seminal contributions to our understanding of cell death and cell survival, especially in cancer and in the immune system. His work has changed how we think about the function of the mitochondria, which not only provide energy to the cell but are also the focus of the "switch" between cellular life and death.



**LANGER, Robert – Department of Biological Engineering, Massachusetts Institute of Technology**

For inventions and discoveries that led to the development of controlled drug release systems, engineered tissues and new biomaterials. For a brilliant scientist and visionary who trained and mentored numerous students and research scholars to become leaders in their fields and for inspiring numerous world scientists.

## SPECIALLY ELECTED FELLOWS



**BARNARD, David – Department of Computer Science, University of Manitoba**

David Barnard has made significant contributions to Canadian society throughout his distinguished career. As President of the University of Manitoba he has led the institution to dramatically increase its research capacity, resulting in discoveries that have made significant global impact. He has championed the principles of diversity and inclusion both on campus and across the country, and has served on the boards of governance for many public and private organizations.



**SCHMIDT, Bonnie – Let's Talk Science**

Bonnie Schmidt, the founder of Let's Talk Science, is a pioneer in science education for Canadian youth and educators. Due to Bonnie's drive and exceptional dedication, the initiative she started as a graduate student more than 25 years ago is now a leading national charitable organization that has impacted nearly seven million Canadians. Let's Talk Science engages all youth regardless of gender, culture or geography, helping them develop skills and attitudes needed for citizenship and work demands in a rapidly changing world.



**HAMDULLAHPUR, Feridun – Department of Mechanical and Mechatronics Engineering, University of Waterloo**

Feridun Hamdullahpur is committed to and passionate about advancing the impact of higher education globally, integrating fundamental principles and innovation, and making it more accessible around the world. Throughout his academic career, Dr. Hamdullahpur has been an active researcher in thermo-fluids and energy engineering. He has authored hundreds of scientific and academic publications and supervised over 50 graduate students. Dr. Hamdullahpur has applied fundamental research to solve every day social and technological problems and brought Fluidized Bed Gasification technology to developing countries like Sierra Leone and India.

## CLASS OF 2018 • NEW COLLEGE MEMBERS



**AUDET, Pascal – Département des sciences de la Terre et de l'environnement, Université d'Ottawa**

Pascal Audet is internationally recognized for his work on the structure and dynamics of the solid Earth, especially his studies of subduction zones where tectonic plates interact and generate giant destructive earthquakes. He is also involved in national initiatives to deploy large-scale and dense networks of geophysical instrumentations across the country, including Canada's northern and offshore regions, to improve monitoring of natural hazards and the responsible development of natural resources.



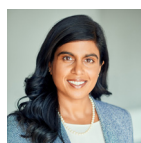
**CHALIFOUR, Nathalie – Faculty of Law, University of Ottawa**

Nathalie Chalifour is a widely recognized expert in environmental law and policy, known for her pioneering efforts to build bridges between environmental issues, economics and social justice. Her research is helping to shape Canada's developing legal framework for climate change and environmental justice. She explores how markets and fiscal policy can be harnessed to protect the environment and promote social justice, and how the *Canadian Charter of Rights and Freedoms* can be used to safeguard the rights of those most vulnerable to the impacts of climate change.



**BARNABE, Cheryl – Department of Medicine, University of Calgary**

Cheryl Barnabe is a Métis academic rheumatologist and clinical epidemiologist, who is leading clinical and research programs that are redefining specialty health services delivery to Indigenous patients living with arthritis. Having identified the high prevalence of rheumatologic conditions and outcome inequities for Indigenous patients, Dr. Barnabe is leading the delivery of a national cultural competency initiative in rheumatology, and implementing innovative models of care in both on-reserve and urban settings.



**CHAUDHRY, Ayesha S. – Institute for Gender, Race, Sexuality, and Social Justice, The University of British Columbia**

Ayesha S. Chaudhry is Canada Research Chair in Religion, Law and Social Justice and Fellow of the Pierre Elliott Trudeau Foundation. She is a leading anti-racist feminist scholar of Islam, and consults on high-level national and international cases concerning human rights, religious freedom, and pluralism. Her research creates space for creatively re-imagining the study of Islam, interrogating what it means to be Muslim, and bringing an intersectional and de-colonial lens to Muslim discourse.



**BROTTO, Lori – Department of Obstetrics and Gynaecology, The University of British Columbia**

Lori Brotto, a Canada Research Chair in Women's Sexual Health, is internationally recognized as a leader in sexual health research. She has led teams to develop effective psychological interventions to improve sexual dysfunction and genital pain, which collectively affect up to a third of women. Her work has influenced international practice guidelines. In less than ten years since the start of her academic appointment (excluding parental leaves), and 15 years since her PhD, she has achieved over 130 peer reviewed publications, 61 grants, and her book "Better Sex Through Mindfulness", a translation of her program of research on women's sexual health, was published in 2018 by Greystone Publishing.



**CHEUNG, William – Institute for the Oceans and Fisheries, The University of British Columbia**

William Cheung has contributed much to the science of climate change; identifying effective solutions to address its impacts on ocean biodiversity and fisheries, and predicting the sustainability of future marine, fisheries and coastal systems. Internationally renowned, Dr. Cheung is highly effective in helping local and international communities understand how their actions are affecting the oceans, and informing policy and practice changes to ensure the sustainability of living marine resources.



**CARDOSO, Hugo – Department of Archaeology, Simon Fraser University**

Hugo Cardoso is fascinated by the stories that children's bones tell about the biological and social conditions of life in the past. He has contributed critical analyses and methodologies to better understand the experiences of children in history, as well as to assist with the identification of children in forensic investigations. He is committed to voicing the social inequalities and violence lived by children in the recent and ancient past.



**CLÉMENT, Dominique – Department of Sociology, University of Alberta**

Dominique Clément is an internationally recognized authority and Canada's leading expert on the history of social movements and human rights. His expertise includes using freedom of information legislation and new technologies for historical research. Clément is currently the Principal Investigator and leader of a SSHRC-funded national research team that includes numerous community partners. This team is examining the history and current status of public funding for Canada's non-profit sector.



**DAWOOD, Yasmin – Faculty of Law, University of Toronto**

Yasmin Dawood is internationally recognized for her interdisciplinary scholarship on voting rights, comparative election law, and democratic theory. A law professor and Canada Research Chair, she has made key contributions to developing innovative solutions for the systemic challenges that undermine electoral fairness and democratic functioning. As one of Canada's foremost experts on election law, her research and public engagement have made influential contributions to policy and public debates.



**EURICH, Dean – School of Public Health, University of Alberta**

Dean Eurich is an internationally recognized clinician-scientist and Canada Research Chair who is advancing the prevention and management of major chronic disease, particularly diabetes. His research is directly translated into health policy and clinical practice guidelines, thereby improving patient and public health. His extensive engaged scholarship with communities and policy-makers generates real-world evidence on pressing public health problems locally and afar, including First Nations.



**FERRARI, Maud – Western College of Veterinary Medicine, University of Saskatchewan**

Maud Ferrari is one of the most exciting, productive, and highly regarded researchers working in the fields of aquatic and behavioural ecology. Her groundbreaking work is transforming the discipline's thinking about how prey gather and update information about risk in altered environmental conditions. The author of over 150 peer-reviewed papers to date, Dr. Ferrari's outstanding contributions have been recognized nationally and internationally and are bringing awareness to new areas of global ecological concern.



**FITZELL, Gordon – Desautels Faculty of Music, University of Manitoba**

Featured on GRAMMY-winning and JUNO-nominated recordings, composer Gordon Fitzell has worked with leading musicians around the world. His music has been performed at major international festivals and reviewed in publications such as *BBC Magazine* and *The New York Times*. In addition to acoustic and electroacoustic concert music, his work explores immersive multimedia environments. He is Artistic Co-Director of the concert music organization GroundSwell and director of the Experimental Improv Ensemble.



**FRIŠČIĆ, Tomislav – Department of Chemistry, McGill University**

Tomislav Friščić is developing new, innovative approaches that make chemical research and manufacturing, cleaner, greener, and simultaneously faster and more efficient. His work involves academic and industrial collaborations, creation of CleanTech businesses, and has created new opportunities and patented processes in a wide range of chemical activities, from making pharmaceuticals and new materials for sequestration of greenhouse gases, to safer and cleaner routes for processing biomass, metals and critical elements.



**GEORGIU, George – Department of Educational Psychology, University of Alberta**

George Georgiou is a world-class researcher examining reading development and dyslexia across languages. His research has brought us closer to a more realistic description of the processes involved in reading and has helped educators around the world reconsider the way reading is taught. Most importantly, his research offers practical hope and an excellent example of knowledge mobilization for the public good.



**GILLIES, Elizabeth – Department of Chemistry, Department of Chemical and Biochemical Engineering, Western University**

Elizabeth Gillies is internationally recognized for her innovative contributions to smart materials design and development. She has performed pioneering work on a new class of plastics that can be degraded on demand and is working with interdisciplinary teams to apply these in fields such as medicine and agriculture.



**GREENE, Elizabeth – Department of Classical Studies, Western University**

Elizabeth Greene is a Roman Archaeologist who is a leader in shaping the field of Roman provincial and frontier studies in Canada. Her research specializes in changing our perceptions of Roman military communities by understanding the indispensable role of women, children and families in the process of conquest and settlement of empires. The impact of her research stretches beyond her direct field to influence areas of Feminist studies, Military history, and comparative research on cultural and military imperialism.



**HAMLIN, Kiley – Department of Psychology, The University of British Columbia**

Kiley Hamlin is an Associate Professor and Tier 2 Canada Research Chair in Developmental Psychology. Her internationally recognized and award-winning research explores the earliest developmental origins of the human moral sense, by examining the emergence of moral judgement and action in preverbal infants, who lack language, sophisticated cognitive abilities, and extensive experience with cultural norms and values. More broadly, Hamlin is interested in the origins of human social and moral cognition from both an ontogenetic and phylogenetic perspective.



**HARELL, Allison – Département de science politique, Université du Québec à Montréal**

Allison Harell holds the UQAM Research Chair in the Political Psychology of Social Solidarity. She is also the founder and co-director of the Political Communication and Public Opinion Lab (LACPOP) and member of the Centre for the Study of Democratic Citizenship (CSDC). Her research focuses primarily on the psychological and interpersonal sources of social solidarity in post-industrialized countries and the political consequences of ethnic, racial and religious diversity for democratic citizenship.



**HASSAN, Ahmed – School of Computing, Queen's University**

Ahmed E. Hassan is the Canada Research Chair in Software Analytics and the NSERC/Blackberry Industrial Research Chair in Software Engineering at the School of Computing at Queen's University. He is a Canadian pioneer and recognized world leader in the engineering of ultra-large-scale systems. His track record of industrial collaboration has yielded numerous patents and innovations that are integrated into products and services used daily by millions of people worldwide.



**HIROSE, Iwao – Department of Philosophy, McGill University**

Iwao Hirose's research lies in the area of value theory in contemporary ethics in two broadly defined but related areas: the theory and value of distributive equality and the ethics of public policy. He is one of a very few scholars who have excellent ability and knowledge in both the disciplines of philosophy and economics. He applies this knowledge and these skills to his work on health care and environmental policy.



**HLAVACEK-LARRONDO, Julie – Département de physique, Université de Montréal**

Julie Hlavacek-Larrondo is an internationally recognized researcher known for her pioneering contributions to the field of supermassive black holes. Her work has had major repercussions for our understanding of galaxy and black hole co-evolution, but also for our understanding of physics of galaxy clusters. She is the recipient of numerous research excellence awards and was granted time as principal investigator on the largest telescopes in the world on numerous occasions.



**KIRTON, Adam – Departments of Pediatrics and Clinical Neurosciences, University of Calgary**

Adam Kirton is a Pediatric Neurologist and Professor of Pediatrics and Clinical Neurosciences at the University of Calgary. He has built an internationally recognized research program that combines epidemiology with advanced neuroimaging and non-invasive brain stimulation to understand how young brains develop following perinatal injuries. His team then translates this new knowledge to execute novel neuromodulation trials to optimize function and future opportunities for disabled children and their families.



**KORKUSINSKI, Marek – Security and Disruptive Technologies, National Research Council of Canada**

Marek Korkusinski, a theorist working at the National Research Council of Canada, is an expert in nanotechnology. He is the leading theorist for the quantum electronics and nano-photonics projects at the NRC. He specializes in materials science and the quantum theory of nanosystems, and collaborates with leading international experimental groups. The computational tools that he developed found applications in diverse fields - from photovoltaics for solar cells to the use of single electron spins for quantum information.



**LANGLOIS, Marc-André – Department of Biochemistry, Microbiology and Immunology, University of Ottawa**

Marc-André Langlois is Associate Professor at the University of Ottawa where he holds the Canada Research Chair in Molecular Virology and Intrinsic Immunity. Recognized for his insights into the fundamental mechanisms of how the human immunodeficiency virus (HIV) escapes detection and destruction by the immune system, this basic research scientist is a leading authority in the field of antiviral defenses and has developed new, cutting-edge technologies to analyze viruses.



**LARSON, Katherine R. – Department of English, University of Toronto**

Katherine R. Larson is an internationally recognized scholar of early modern English literature and culture. Her work has made a vital contribution to our understanding of the history of women's writing, the gendered dimensions of conversation and language use, and musical-literary relations. Professor Larson is also esteemed for her leadership in fostering interdisciplinary and collaborative work in the humanities. A Rhodes Scholar and the winner of the 2008 Polanyi Prize for Literature, she is Associate Professor of English at the University of Toronto.



**LIU-AMBROSE, Teresa – Department of Physical Therapy, The University of British Columbia**

Teresa Liu-Ambrose, UBC Professor of Physical Therapy and Canada Research Chair, is an international leader in Healthy Aging Research. Using rigorous clinical trial methodology, she has pioneered insights into various types of exercise programmes in preventing cognitive decline and falls in older adults. Her work has led to surprising and highly influential insights in an area of profound societal need. She has assumed leadership roles in major Canadian and international forums and projects, and translated her findings to directly benefit patients.



**LESSARD, Geneviève – École de travail et de criminologie, Université Laval**

Geneviève Lessard is internationally recognized for her work on children exposure to intimate partner violence, which is one of the most common forms of child abuse and affect children development. Her work, carried out in close collaboration with several practice communities, makes it possible to generate innovative prevention and intervention tools that help to reinforce the protective factors and modify the life course of children affected by violence.



**LÜTHI, Lorenz – Department of History, McGill University**

A multilingual scholar, Lorenz Lüthi works on Cold War issues from an international perspective investigating how the structure of the international system interacts with ideologies. His work on the Sino-Soviet split changed the whole field of investigation. His current research focuses on the global Cold War in three distinct but related regions: Europe, the Middle East, and East Asia linking Cold War aspects of national and international history across continents.



**LINDBERG, Tracey – Faculty of Law, University of Ottawa**

Tracey Lindberg is one of Canada's foremost scholars in Indigenous laws and legal orders, Indigenous governance, and Indigenous education. She seeks to replace shallow political and legal categorizations of Indigenous people with nuanced understandings of Indigenous knowledge and traditions, reinvigorated by the active participation of Indigenous societies. She is also the author of the acclaimed 2015 novel, *Birdie*, a story grounded in both her research and her lived experiences.



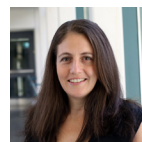
**MacLEOD, Anna – Continuing Professional Development and Medical Education, Dalhousie University**

Known for her innovative approaches to exploring medical education, Anna MacLeod is at the forefront of her field. Her insights are sought by colleagues nationally and internationally, demonstrated by her visiting scholar appointments and speaking engagements. MacLeod's award-winning contributions have elevated the discourse of medical education, incorporating critical social science perspectives and broadening theory, while making a significant practical contribution to the design and delivery of medical education locally, nationally and around the world.



**LINDSAY, Sally – Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital, University of Toronto**

Sally Lindsay, is a Senior Scientist at Bloorview Research Institute, Holland Bloorview Kids Rehabilitation Hospital and Associate Professor in Dept. Occupational Therapy and Occupational Science at the University of Toronto. She is recognized for her work on enhancing the social inclusion and participation of children and youth with disabilities at school, work and in the community. She has developed evidence-based interventions to help equip youth, educators and employers with the tools they need to enhance the inclusion of young people with disabilities.



**McGUIGAN, Alison – Department of Chemical Engineering & Applied Chemistry, University of Toronto**

Alison McGuigan is an Associate Professor in Chemical Engineering and Applied Chemistry and the Institute for Biomaterials and Biomedical Engineering at the University of Toronto and the Erwin Edward Hart Professor of Chemical Engineering. Dr. McGuigan has developed creative strategies to assemble and organize complex engineering tissues for understanding fundamental tissue biology and identifying novel disease mechanisms. With pharmaceutical partners, she is using these platforms to develop novel disease therapies.



**MILLS, Sean – Department of History, University of Toronto**

Sean Mills is a historian of post-1945 Canadian and Quebec history, with research interests that include postcolonial thought, migration, race, gender, and the history of empire and social movements. In his prize-winning and widely acclaimed articles and books, he has significantly contributed to the internationalization of Canadian history, and has opened up new pathways of research into Canada's relationship with the Global South.



**MOORES, John Edward – Department of Earth and Space Science and Engineering, York University**

John Moores is an internationally recognized planetary scientist and space engineer whose research explores the atmospheres and surfaces of other worlds. His research group has been a member of the science and operations teams of four ESA and NASA space missions to Mars and Titan and has been awarded the NASA group achievement award on 16 occasions. In this work, he has published 55 papers garnering over 4000 citations.



**MUIS, Krista – Department of Educational & Counselling Psychology, McGill University**

Krista R. Muis is a Canada Research Chair Tier II in epistemic cognition and self-regulated learning. Her research focuses on how students' epistemic cognition and emotions influence various facets of learning, motivation, and academic performance. She also examines how individuals process complex, contradictory content on socio-scientific issues such as climate change, genetically modified foods, and vaccinations. Her research informs classroom practices in mathematics and science learning across multiple educational levels.



**MYLES, Sean – Department of Plant, Food, and Environmental Sciences, Dalhousie University**

Sean Myles develops and uses modern genomics tools to explore the history and improve the future of agricultural species. His research has provided insights into the histories of grapes, apples and cannabis and he is at the forefront of research aimed to accelerate the breeding of these crops using genomics.



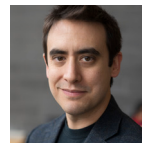
**PANT PAI, Nitika – Department of Medicine, McGill University**

Nitika Pant Pai, a tenured Associate Professor at McGill University, is a recognized global expert in point-of-care diagnostics for HIV and co-infections. Using implementation research, she develops integrated innovations that plug health service gaps in low-middle to high-income settings. She synergizes diagnostics, process innovations, and artificial intelligence with program science, for public health and social impact. A recipient of research and innovation awards, she advises health agencies, and contributes to global diagnostic policies.



**PARÉ, Guillaume – Department of Genetic and Molecular Epidemiology, McMaster University**

Guillaume Paré is a professor of pathology and molecular medicine and director of the Medical Biochemistry Postgraduate Education Program at McMaster University. A world-leading physician-scientist in the area of genetic and molecular epidemiology of cardiovascular disease, his research has achieved critical advances in our knowledge of the genetic causes of heart attack and stroke and he is establishing new ways to identify high-risk patients, modifiable risk factors, and preventive therapies.



**PELLING, Andrew – Department of Biophysics, University of Ottawa**

Andrew Pelling is a highly creative leader in the field of mechanobiology. His internationally acclaimed research has illuminated previously unknown biological pathways which enable living cells and tissues to be controlled and regulated through physical cues. These achievements have been well recognized with numerous distinctions and awards. Andrew has also established several start-up companies which are translating his fundamental research into biomedical applications in healthcare, tissue engineering and regenerative medicine.



**POULIOT, Vincent – Department of Political Science, McGill University**

Vincent Pouliot is nationally and internationally known for his leadership in developing a new approach to the study of world politics, often referred to as the practice turn in International Relations. He is widely recognized as one of the main contributors to this innovative research program, which has now spread across subfields ranging from security studies to global governance through environmental politics, international law, and political economy.



**REDER, Deanna – Department of English, Department of First Nations Studies, Simon Fraser University**

Deanna Reder is a Cree-Métis scholar who exemplifies outstanding leadership and scholarship in her many contributions to the growing field of Indigenous Literary Studies. Her work champions autobiography as Indigenous intellectual tradition and theoretical practice. Her research focuses on previously unpublished writing by Indigenous authors in order to bring attention to the critically neglected archive and produce a comprehensive database on Indigenous writing in northern North America up until 1992. To date, her publications are the result of collaborations with others to produce some of the first anthologies on Indigenous literary criticism and Indigenous fiction in Canada.



**REN, Carolyn – Department of Mechanical Engineering, University of Waterloo**

Carolyn Ren is internationally recognized for her seminal contributions to microfluidics and Lab-on-a-Chip research. Her physical and theoretical models, as well as her design and optimization tools, have greatly enhanced the understanding of transport phenomena and have enabled new, truly integrated Lab-on-a-Chip devices for high throughput screening applications. Already one of Canada's foremost microfluidics researchers, Dr. Ren's work promises broad and profound impacts for the global biomedical, pharmaceutical, and environmental sectors.



**ROSEN, Natalie – Department of Psychology and Neuroscience, Dalhousie University**

Natalie Rosen, an Associate Professor of Psychology & Neuroscience at Dalhousie University, is internationally recognized for her contributions to the fields of pain and sexual dysfunction by approaching them from a dyadic perspective, and translating her findings into evidence-based interventions to improve couples' health and well-being. Through enhanced knowledge of the interpersonal dynamics that maintain these problems, her work represents a paradigm shift in the way these disorders are conceptualized, studied, and treated.



**SANDLOS, John – Department of History, Memorial University of Newfoundland**

John Sandlos conducts innovative research in the field of environmental history in Canada, with expertise in the areas of wildlife conservation, national parks, and extractive industries. He has directed three major SSHRC-funded projects examining the environmental impacts of historical mines on northern Indigenous communities. He is author of the award winning book, *Hunters at the Margin*, and co-editor of the award winning collection, *Mining and Communities in Northern Canada*.



**SAPIEHA, Przemyslaw (Mike) – Département d'ophtalmologie et de biochimie et médecine moléculaire, Université de Montréal**

Mike (Przemyslaw) Sapieha is the Wolfe Professor in translational vision research, Canada Research Chair in retinal cell biology and director of the Neurovascular Eye Disease Lab at the Université de Montréal. His team made several fundamental discoveries implicating deregulation of neuronal metabolism and cellular senescence in retinal vascular diseases such as diabetic retinopathy and age related macular degeneration. Notably, he identified critical roles for Semaphorins and Netrins in these diseases.



**STINSON, Jennifer – Lawrence S. Bloomberg School of Nursing, University of Toronto**

Jennifer Stinson is internationally recognized for her innovations in the field of pediatric digital health. Her work specifically focuses on improving health outcomes in youth with chronic and life-limiting illnesses. She investigates the area of pain and symptom management and the use of e-health and m-health technologies to improve the assessment and management of pain and other symptoms. Dr. Stinson's clinical work focuses on working with children and youth with chronic pain and their families as part of an interdisciplinary pain team in the Department of Anesthesia and Pain Medicine at SickKids.



**SYLVESTRE, Marie-Eve – Faculté de droit, Université d'Ottawa**

Marie-Eve Sylvestre is one of Canada's leading thinkers on the criminalization of poverty and the regulation of conflicts related to urban public spaces and those who use them, including the homeless, street-based drug users and sex workers, and political demonstrators. An elected member of the Global Young Academy, her work is interdisciplinary, building on an alliance between law, criminology and geography. She is a pioneer in exposing invisible practices of discrimination against Indigenous people and marginalized populations in the criminal justice system and in promoting alternatives to criminalization.



**TURCOT, Laurent – Département des sciences humaines à la section histoire, Université du Québec à Trois-Rivières**

Laurent Turcot is a specialist in European and transatlantic cultural history. He is internationally recognized for his work on the relationship between society, sports and leisure. He co-founded the Laboratory on the History of Modern Thought and the Research Group on the History of Sociabilities. He holds a Canada Research Chair in the History of Leisure and Entertainment. He has been awarded the Prix du Document sportif for *Sports et loisirs, une histoire des origines à nos jours*, and the UQTR Teaching Excellence Award.



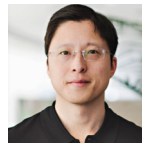
**TURKEL, William – Department of History, Western University**

William J. Turkel is Professor of History at Western University and internationally recognized for his innovative work in digital history. He uses machine learning, text mining and computational techniques in his study of the histories of science, technology and environment, drawing on many decades of programming experience.



**WAY, Danielle – Department of Biology, Western University**

Danielle Way, a world leader in the field of global change biology, works to elucidate how climate change will impact plants, particularly the evergreen trees that comprise Canada's boreal forest. Her research has revealed how rising temperatures and CO<sub>2</sub> affect plant physiological processes, which not only increases our knowledge of how climate affects plants, but also provides the forestry industry with essential information on future forest productivity and function.



**WONG, Alexander – Department of Systems Design Engineering, University of Waterloo**

Alexander Wong is internationally recognized for his pioneering contributions to operational artificial intelligence and computational medical imaging. As a Canada Research Chair at the University of Waterloo, his work on scalable and explainable deep learning aims at making AI technology accessible to everyone, and at gaining a deeper understanding in how neural networks think. A prolific innovator, his creative work in computational medical imaging has led to the invention of a new form of MRI designed for cancer detection, the first blood-flow imaging system for observing arterial and venous flow from a distance, and a spectral light-field fusion microscope without lenses.



**ZENG, Hongbo – Department of Chemical and Materials Engineering, University of Alberta**

Hongbo Zeng is an internationally recognized leader in intermolecular forces and interfacial science. He has made outstanding contributions to the elucidation of intermolecular and surface interaction mechanisms among soft materials (polymers, biopolymers), colloids, emulsions and bubbles that determine their unique physicochemical properties and performances in various engineering and biological processes, and to the development of new functional materials (self-healing materials, adhesives) and surfaces via tunable intermolecular interactions.

# 2018 MEDAL & AWARD WINNERS

## YVAN ALLAIRE MEDAL



**SAVOIE, Donald J. – Université de Moncton**

Donald J. Savoie's contributions to governance have been widely applauded in Canada and abroad. His scholarly publications have won prizes in Canada, the United States and Europe. He has served as an advisor on governance to the United Nations, OECD, the World Bank and to several countries including Russia and China. He is an Officer of the Order of Canada, Fellow of the Royal Society of Canada, was awarded the Killam Prize in Social Sciences (2015) and received nine honorary degrees.



## URSULA FRANKLIN AWARD IN GENDER STUDIES



**HEAP, Ruby – Université d'Ottawa**

Ruby Heap is a world class scholar in women's studies and women's history, developing an innovative field of research at the intersection of the history of feminism and the history of science and engineering. Her award-winning scholarship has played a central role in creating and enriching gender studies. She is the Founding Director of uOttawa Institute of Women Studies and a Canada-US Fulbright Scholar, and received the President's Award from the Professional Engineers of Ontario, for services rendered to the profession.

## BANCROFT AWARD



**JÉBRAK, Michel – Université du Québec à Montréal**

Michel Jébrak, a professor in the Department of Earth and Atmospheric Sciences (UQAM), has made a major contribution to earth science knowledge through an innovative perspective on mining operations, including the social aspects of resource development, through his exceptional leadership in creating networks between various environments to facilitate the transfer of knowledge and the training of specialists internationally.

## INNIS GÉRIN MEDAL



**CLAPP, Jennifer – University of Waterloo**

Jennifer Clapp is a world-renowned social scientist focused on global environmental politics and international food security. She has made pioneering and high-profile contributions to both fields through ten books, seven special journal issues, and over 100 refereed articles and chapters. Her work has been recognized through numerous national and international awards and has significantly affected policy in Canada and internationally.



## FLAVELLE MEDAL

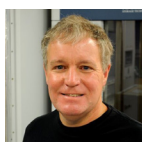


**PLUMMER, Francis – University of Manitoba**

Francis Plummer's pioneering work on HIV was central to global understanding of the risk factors for transmission and preventive measures for HIV. Global interventions and campaigns have been built on his work, and these currently save tens of thousands of people annually. His discovery of natural immunity to HIV among sex workers in Africa and subsequent "immune quiescence" theory shifted the scientific paradigm with respect to human immunity to HIV.



## McLAUGHLIN MEDAL



**WRANA, Jeff – Lunenfeld-Tanenbaum Research Institute, University of Toronto**

Jeff Wrana is nominated for his seminal discovery of the TGF $\beta$  signal transduction system and its contribution to our understanding of biology, human disease and its treatment. In addition, his contributions to the field of developmental cell biology, promotion of Canadian science through collaborative research facilities and international impact make him a particularly worthy recipient of the McLaughlin Medal.



## WILLET G. MILLER MEDAL IN EARTH SCIENCES

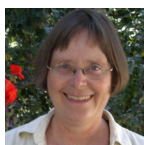


**PRICE, Raymond A. – Queen's University**

Raymond Price has been acclaimed nationally and internationally for his exploration and graphic descriptions of the geology, geophysical setting, origin, and tectonic evolution of the southern Canadian Rocky Mountains, and also for his conceptual models of tectonic processes at various scales. His distinguished research and his influence on resource, environmental and geoscience policy while in government and academia has been recognized by numerous North American and European medals.



## WILLET G. MILLER MEDAL IN OCEAN SCIENCES



**GARGETT, Ann – Institute of Ocean Sciences**

Ann Gargett is internationally recognized for her ground-breaking work on ocean turbulence, mixing and layering. Her contribution includes innovative observational approaches to measure turbulence, meticulous data analysis, the development of theory, and the elaboration of the importance of turbulence to biological processes in the ocean. Her pioneering studies, clarity in exposition and generous advice have especially inspired females to enter the exceptionally demanding discipline of physical oceanography.



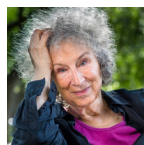
## KITTY NEWMAN MEMORIAL AWARD



**HIROSE, Iwao – McGill University**

Iwao Hirose's research lies in the area of value theory in contemporary ethics in two broadly defined but related areas: the theory and value of distributive equality and the ethics of public policy. He is one of a very few scholars who have excellent ability and knowledge in both the disciplines of philosophy and economics. He applies this knowledge and these skills to his work on health care and environmental policy.

## LORNE PIERCE MEDAL



**ATWOOD, Margaret**

Margaret Atwood is the author of more than fifty books of fiction, poetry and critical essays. Her recent novels are *The Heart Goes Last* and the MaddAddam trilogy—the Giller and Booker Prize-shortlisted *Oryx and Crake*, *The Year of the Flood* and *MaddAddam*. Other novels include *The Blind Assassin*, winner of the Booker Prize; and *Alias Grace*, *The Robber Bride*, *Cat's Eye*, *The Penelopiad*—a retelling of the *Odyssey*—and the modern classic *The Handmaid's Tale*—now a critically acclaimed television series. *Hag-Seed*, a novel revisitation of Shakespeare's play *The Tempest*, was published in 2016. Her most recent graphic series is *Angel Catbird*. In 2017, she was awarded the German Peace Prize, the Franz Kafka International Literary Prize, and the PEN Center USA Lifetime Achievement Award.



## MIROSLAW ROMANOWSKI MEDAL



**FAHRIG, Lenore – Carleton University**

Lenore Fahrig's work has created paradigm shifts in research on habitat connectivity and fragmentation, road ecology, and sustainable agriculture. She is a trailblazer in these fields, with one of the highest citation rates in ecology, including the world's most-cited paper on habitat fragmentation. She is a highly influential and internationally renowned researcher in conservation ecology, and her contributions have helped define the field of landscape ecology.



## RUTHERFORD MEMORIAL MEDAL IN CHEMISTRY

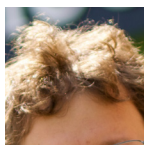


**FRIŠČIĆ, Tomislav – McGill University**

Tomislav Friščić has made outstanding contributions to chemistry and physics of solids, revealing previously unknown reaction mechanisms, enabling access to previously unobtainable molecules and materials, and developing cleaner, safer chemistry for research and manufacturing. The mechanistic studies and processes developed by Friščić impact a wide range of applications, from pharmaceuticals, metallodrugs and food chemistry, to nanomaterials, adsorbents for gas storage and separation, and cleaner exploitation of organic and mineral feedstocks.



## RUTHERFORD MEMORIAL MEDAL IN PHYSICS



**BLAIS, Alexandre – Université de Sherbrooke**

Alexandre Blais has helped develop the theoretical foundations of circuit quantum electrodynamics, a field of research that established links between quantum information, solid-state physics and quantum optics. For more than ten years, his ideas at the forefront of the field have resulted in important conceptual advances and inspired much of the dazzling experimental progress in this new field of research, suggesting the possibility of realizing a quantum computer.



## JOHN L. SYNGE AWARD



**MOHAR, Bojan – Simon Fraser University**

Bojan Mohar is a Slovenian-Canadian mathematician who holds a Canada Research Chair position at the Simon Fraser University. He is one of the world leaders in Graph Theory and is well-known for his solutions of open problems and conjectures. Interplay of combinatorics, geometry, topology and algebra is visible in most of his work. His deep and transformative results in topological and structural graph theory made lasting impact not only in topological graph theory but also in theoretical computing and other fields.

## J.B. TYRRELL MEDAL



**WAISER, William (Bill) – University of Saskatchewan**

Bill Waizer is an award-winning scholar and one of Canada's foremost historians of the West. Dr. Waizer has published sixteen books, including *A World We Have Lost: Saskatchewan Before 1905*, winner of the 2016 Governor General's Literary Award for Non-Fiction. He is perhaps best known for his award-winning *Saskatchewan: A New History*, his centennial history that is widely regarded as the foremost history of the province.



## ALICE WILSON AWARDS



**JEAN-BOUCHARD, Évelyne (SSHRC)**

Évelyne Jean-Bouchard is a researcher specializing in feminist legal anthropology. Her doctoral studies at the University of Ottawa focused on the legal experiences of Congolese women in North Kivu, Eastern DRC. As a postdoctoral fellow at the University of Montreal's Public Law Research Center, she will seek to better understand the role and place of women in Indigenous governance bodies in Quebec.



**JESSRI, Mahsa (CIHR)**

Mahsa Jessri is a CIHR Banting postdoctoral Fellow at the Clinical Epidemiology program, Ottawa Hospital Research Institute. She completed her doctoral studies at the University of Toronto and is trained as a public health nutritionist/dietitian. Dr. Jessri's research has advanced the knowledge in the area of chronic disease and nutritional epidemiology, providing a robust foundation for informing nutritional policies and guidelines for promoting health at the population level.



**BAILEY, Gwendolyn (NSERC)**

Gwen Bailey's nationally acclaimed research spans synthetic inorganic chemistry, mass spectrometry, and catalysis. Her doctoral research exposed modes of undesired reactivity for the dominant, highly-active ruthenium catalysts during olefin metathesis, an exceptionally powerful and "green" technology for building carbon-carbon bonds. For her postdoctoral research at Caltech, Gwen will synthesize new metal clusters that mimic the structure of biological active sites, and explore their reactivity towards small molecules relevant to sustainability.

# INSTITUTIONAL MEMBERS

As a member-based organization, the RSC has relied historically on the annual support of individual members elected for their achievements and commitment to contribute to a better future. Since 2004, a membership category for institutions has enabled the RSC to significantly expand its structure as well as its scope of activities. This expansion

now includes the College of New Scholars, Scientists and Artists; our fully renovated head offices at Walter House; and a major role with the collaborating academies of the G7 and G20 countries. Today the following organizations are Institutional Members of the Society.



## REALIZING OUR DIGITAL FUTURE AND SHAPING ITS IMPACT ON KNOWLEDGE, INDUSTRY, AND THE WORKFORCE

MAY 2018

### EXECUTIVE SUMMARY

Digital technologies are transforming the early 21<sup>ST</sup> century, leading to the creation of entirely new industries based upon machine learning and artificial intelligence and lowering barriers to participation in and access to data, education, and communication tools for citizens around the world. It is believed that international cooperation will be essential in key areas of security, accessibility, and regulation to secure a digital future that is inclusive, democratically governed and ethically minded in which open data and reliable information can circulate. With these objectives, the Academies propose the following principles of action:

- Inclusion and access with the goal of equal opportunity to participate in and gain from the digital transformation, to channel gains equitably and eliminate digital divides.
- Information literacy relying on a comprehensive educational plan for all age groups with the objective of providing skills and tools allowing citizens to critically interpret, verify and validate the quality of information circulating in the digital infrastructure.
- Quality of tools and standards through robust mechanisms for production, validation, access and dissemination of open data, information and machine learning systems, to strengthen reliability and security, preventing tampering, manipulation and privatizing use of data and ensuring that machine learning algorithms are interpretable by non-specialists.
- Democratic governance in the form of regulatory frameworks to set up an oversight of internet service providers, social media and other entities and prevent private monopolistic or oligopolistic power in the digital economy and to ensure open and neutral internet, protection of digital data and respect for norms of individual privacy.
- Employment and training policies to encourage new economic activities, foster emerging technological sectors and ensure that the benefits of new technologies also be distributed to workers and that schemes be available for their training and reemployment.
- Ethics and human values should guide the development of digital technologies, artificial intelligence and big data analytics and intervene in all stages of digital innovations to preserve values of freedom, democracy, justice and trust.

## REALIZING OUR DIGITAL FUTURE AND SHAPING ITS IMPACT ON KNOWLEDGE, INDUSTRY, AND THE WORKFORCE

The promises and challenges of the digital revolution continue to expand and change, making the precise character of our digital future profoundly uncertain. We must urgently focus on key policy challenges and principles for action in order to make optimal decisions and choices for realizing our digital future and shaping its impact on knowledge, industry and the workforce. This statement highlights these challenges and principles by drawing upon insights and evidence from across scientific and scholarly fields.

Civil society groups, governments, businesses and individuals have been embracing information and communication technologies (ICTs) in digital tools that drive innovation, economic growth, and social prosperity. These tools support the capturing of data to drive insight and knowledge creation while facilitating access to information, collaboration, learning, discovery, and sharing across geographical distances and national borders. Technologies such as artificial intelligence, machine learning, crowdsourcing, big data analytics, blockchain, digital transactions, and automation increase efficiencies in production and service delivery, change the nature of work, and make new business models possible. Future developments, including quantum computing, may accelerate these changes. New ways of conducting science, learning and collaboration across all research fields emerge from increasing insights from data.

At the same time, potential vulnerabilities and perils expand and change with the increasing importance of the digital revolution. Digital technologies disrupt existing business practices, social structures, and economic relationships. Such technologies reshape economies, changing the boundaries between market and non-market activities, disrupting jobs, reducing individual agency in decision-making, diminishing control over personal data, and devaluing labour. The rate and scale of change brought about by the digital revolution magnify the challenges for those unable to take advantage of its opportunities or disproportionately affected by rapid transformations. As ICT developments increasingly affect individual and collective decision-making and understandings of the world, those without adequate digital literacy are seriously disadvantaged.

Accordingly, a central challenge of our time consists of harnessing this wave of widespread disruption to ensure that benefits are distributed equitably, that deleterious effects and vulnerabilities are addressed, and that increasing risks are contained.

Governments around the world have been preparing for the digital future, working in partnership with international organizations, national scientific academies, and other agencies. Initiatives are underway to better reflect social needs as tomorrow's digital technologies and information resources are developed. Strategies to enable universal access to the tools and networks that power digital

economies and support social inclusion are being implemented, albeit unevenly. Individuals, businesses, civil society, and governments are now positioned to reap massive benefits from the adoption of digital technologies by collectively recognizing, critically reflecting upon, and addressing five policy challenges.

### POLICY CHALLENGES

- 1. Inclusion and Equity of Access:** The digital revolution presents tremendous opportunities to reduce socio-economic inequalities within and among countries. At the same time, accessibility gaps and forms of polarization are intensifying existing stratification between “winning” and “losing” economic sectors, businesses, social groups, and even societies—thereby potentially excluding significant parts of humankind from the gains of this revolution. Educational and infrastructure programs to grant all citizens access to digital skills needed for jobs of the future; to high-speed internet; and to media and information literacy remain underfunded or underdeveloped. Digital inequities are particularly evident in remote, rural, and poor communities. Social media platforms and online forums, valued for enabling the free exchange of ideas and networked social interaction, have also become spaces in which some citizens (disproportionately women, Indigenous peoples, racialized communities, and diverse vulnerable groups) experience harassment and abuse. Technological interfaces designed for some groups of users but not others can curtail the ability and willingness of citizens to participate in digitally-mediated public debate.
- 2. Information Quality, Security, and Resilience:** The quantity of data produced and disseminated through digital technologies and platforms has not yet been matched by a corresponding bolstering of procedures and norms to verify and validate the sources, quality, diversity, and technical accuracy of the data, nor by policies to protect the security and ensure the resilience of digital infrastructure. All major infrastructure systems have become digitally-based and have major cyber vulnerabilities. Public understanding of key issues and problems may be stagnating in some areas (such as climate change or vaccinations) as information bubbles have proliferated. The potential for subtle or covert manipulation of public opinion is growing, while public confidence and trust in traditional sources of information and knowledge (such as scientific bodies and media of record) erodes. As dependence on data, ICTs and their related systems grows, so does the significance of their vulnerabilities and potential failures.
- 3. Transparency, Openness, and Interoperability:** Many recent technological transformations have appropriated personal data, fostered proprietary standards, or utilized “black boxed” algorithms. Examples include social scoring to quantify individual

risk, shortlisting of job candidates, setting of prices for online transactions, and the selection of optimized and suppressed information in social media. The lack of regulatory structures to ensure oversight, transparency, interoperability, interpretability, and scrutiny of digital data and its uses presents a challenge to democratic principles of openness and accountability. Where the complexity of some systems, such as those based on deep learning, makes their outputs difficult to explain, new approaches to ensuring openness and accountability may be required, based on understanding how these systems work in practice.

**4. The Future of Work:** Driven by developments in artificial intelligence and machine learning, digital technologies and business strategies are leading to the automation or replacement of jobs across various skills and economic sectors, while creating a variety of new jobs and augmenting the abilities of workers to perform in existing and emerging industries. The ultimate effects of these changes depend on the direction of technological innovation, and how workers, employers, and policy makers respond to it. The evidence thus far shows that the resulting disruption is producing an uneven distribution of work-related gains and losses within and between societies, in terms of job security, wages, working time, or entrepreneurial opportunities.

**5. Ethics:** Digital capacities have outpaced the institutional arrangements and public understanding on which normative frameworks can be based to ensure that innovation respects principles of public good and human welfare. The fact that something can be done does not necessarily imply that it should be done, notably in the absence of clearly defined ethical guidelines (in the cases of autonomous systems and weaponized artificial intelligence, for instance). The shift from analogue to digital life demands new ethical frameworks to address new fundamental questions regarding the reconciliation of digital technologies to human values, the consequences of human interactions with intelligent machines, and the meaning of responsible innovation.

## PRINCIPLES FOR ACTION

Broad engagement across civil society, industry and governments will be essential to collectively address the five policy challenges noted above, and thereby to realize the potential of the digital revolution to enhance quality of life for everyone. Equity, inclusion, security, and prosperity in our digital world is the responsibility of all. We suggest the following principles for action.

**1. Inclusion and Access:** The goal of equal opportunity for all to participate in and gain from digital transformations requires consultative design and continuing public dialogue and public programs. Public programs should aim to disseminate technical skills

and make data and digital infrastructure accessible to citizens regardless of geographical location or socio-economic status. It is essential to measure and monitor inclusivity in emerging technological areas. Public programs are essential to channel the gains of technological disruption equitably across societies, while preventing disruption from disproportionately affecting vulnerable segments of the population and workforce. While progress has been made on this front, digital divides persist and must be eliminated as a matter of priority.

**2. Information Literacy:** In addition to access to data, citizens need general digital skills and tools. Citizens now require increasing familiarity with ethical issues surrounding the uses and applications of ICTs, and critical literacy to interpret and validate the quality of information. Among multiple benefits, such capacity can help guard against false claims and coordinated disinformation campaigns. Citizens should be able and encouraged to participate in online interaction through which they can express their opinions and disseminate information. In this way, digital public spaces such as social media platforms can better find a balance between two fundamental democratic norms—protecting freedom of expression and eliminating hate speech. Comprehensive education to develop such digital literacy skills is required for all ages.

**3. Quality of Tools and Standards:** Robust mechanisms, procedures, and standards for the production, validation, and dissemination of data and information are needed to strengthen data reliability, infrastructure security and resilience, interoperability, accessibility, transparency, and factual accuracy. This could include new standards or guidance to create trustworthy and resilient cybersecurity systems. At the same time, action is required to prevent tampering, manipulation, and arbitrary or privatizing uses of data and digital infrastructure. Quality control measures and open standards are essential for effective evidence-based scientific research and societal decision-making, and to secure citizens' trust in democratic institutions. Long-term preservation and curation of data resources are essential. Such measures and standards must be co-designed, implemented and enforced by stakeholders within governmental and international organizations, the private sector, and civil society. Developers should ensure that machine learning methods and algorithms are interpretable by non-specialists and thus open to public scrutiny.

**4. Democratic Governance:** Regulatory frameworks and policies are needed to provide democratically governed oversight of internet service providers, social media corporations and other entities that serve as gatekeepers and data stewards. The emergence of private monopolistic or oligopolistic power in

the digital economy should be prevented in order to safeguard the principles of an open and neutral internet. It is vital to ensure service neutrality and to ensure the protection of digital data to respect norms of individual privacy and safety while preserving data in the public domain. Patterns of data use in the 21<sup>st</sup> century have led to a reflection on ownership and control of personal data and information by the individual; humans and their digital selves must enjoy rights to dignity and respect. International cooperation will be essential to the implementation of this principle.

5. **Employment and Training:** Appropriate public policies and private investment models must encourage new economic activities and employment opportunities, and foster the growth of small- and medium-sized players, as well as fund and support—through tax incentives or targeted strategic investments—training and re-employment opportunities for workers. Education, training, and mentoring are needed to complement technical knowledge. Such opportunities should also address creativity, innovation, adaptability, and interpersonal skills to adjust to changing labour markets. Policies should ensure that the benefits of new technologies be distributed to workers in the form of reduced or more flexible working hours, higher wages, and better working conditions. These benefits should also contribute to societal needs via appropriate tax policies.
6. **Ethics and Human Values:** Appropriate ethical models must guide the development of digital and computationally-based technologies, artificial

intelligence and the use of big data. Innovation should be pursued within a framework of ethical considerations regarding human welfare and ecological preservation. Shared social norms, moral frameworks, and technical principles—such as open data standards, responsible technological development, and the protection of nature—are essential to our global digital future.

## CONCLUSION

The digital revolution is transforming the early 21<sup>st</sup> century, leading to the creation of entirely new industries based upon artificial intelligence and machine learning, and lowering barriers to participation in and access to data, education, and communication tools for citizens around the world. By drawing upon insights and evidence from across scientific and scholarly fields to address specific policy challenges and guided by the principles highlighted in this statement, we believe that significant gains can be harnessed and optimized, via national and regional governments and institutions, civil society and private sector actors. International cooperation will be essential in key areas of security, accessibility, and regulation. Our Academies intend to continue our efforts to inform this process and contribute to ongoing communication and international collaboration amongst all stakeholders. Together, we can secure a digital future that is inclusive, democratically governed, ethically minded, and in which open data and reliable information can circulate—that is, a future in which all citizens will be equipped to respond to challenges and take advantages of emerging opportunities.



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Nationale Akademie  
der Wissenschaften

*G. J. Th. h.*



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*Charles H. H.*

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ROYAL  
SOCIETY

V. Ramakrishnan



*Y. Iijima*



INSTITUT DE FRANCE  
Académie des sciences

*Stéphane Cardé*



ACCADÉMIA NAZIONALE DEI LINCEI

*Alberto Perugini-Corsini*



NATIONAL ACADEMY OF SCIENCES

*Marcia McNutt*

## THE GLOBAL ARCTIC: THE SUSTAINABILITY OF COMMUNITIES IN THE CONTEXT OF CHANGING OCEAN SYSTEMS MAY 2018

### EXECUTIVE SUMMARY

The Arctic is being profoundly transformed by climate change. This has implications on terrestrial and marine ecosystems, affecting those who live on and from them. It is time to develop a shared scientific vision to protect these vital ecosystems as best we can, produce science for evidence-based decision-making and enhance collaborative scientific investigations of these issues. The G7 Academies propose the following:

- Research cooperation relying on augmented interdisciplinary research supported by large scale international science initiatives in combination with cooperative decision-making among Arctic nations;
- Training individuals from a diversity of fields and backgrounds, including those residing in the Arctic, to ensure the necessary scientific capacity to address global and local issues;
- Accessible, usable and timely science databases that can be shared among all stakeholders and decision makers;
- Programs on remote sensing linked with in-situ monitoring activities integrating sustained high-inclination satellite missions, new technologies for underwater measurements and regionally-integrated in-situ monitoring that incorporates local knowledge.

## A CHANGING ARCTIC OCEAN AND ECOSYSTEMS

Arctic air temperature is increasing at twice the rate of the global average, equating to an approximate 2°C increase over the course of the 20<sup>th</sup> century. Since satellite measurements began in 1979, Arctic sea ice extent has declined in all months of the year and at an astonishing rate of 13.2% per decade for the month of September (or 86,100 square kilometers per year). These changes have global consequences for ocean temperatures, salinity, water circulation and acidification. Particularly significant is the Greenland ice sheet, which has been losing about 270 billion tons of ice every year since the early 2000s, and as a result now contributes to around 25% of global mean sea level rise. Fresh water increases in the Arctic due to sea ice melting, Greenland ice mass loss, and Siberian river runoff alter Arctic ocean circulation patterns, and impact air-sea interactions and related chemical exchange processes that can have consequences on a global scale.

Changes to the Arctic climate system have resulted in less predictable weather patterns; sea ice formation occurring later, earlier sea ice break-up; melting of glaciers; thawing permafrost, with the potential increase of methane release; increased coastal and soil erosion. Most researchers expect that, due to climate change, the Arctic will become largely free of sea ice (i.e. less than 1 million km<sup>2</sup> in extent) during the summer months sometime between 2030 and 2070, profoundly transforming regional and global environmental processes. All of these factors will result in profound changes to important feedback loops such as when sea ice, which reflects light, turns to open water that absorbs heat—meaning that climate change will continue in the region and at an accelerated rate. Furthermore, there will be a significant shift in the abundance of species, their seasonal occurrence and geographic distribution, thereby affecting Arctic food webs and local food security.

### HEALTHY OCEANS, HEALTHY COMMUNITIES, AND HEALTHY PEOPLES

The Arctic is being significantly impacted by climate change. Biophysical impacts related to changing temperature, precipitation, extreme weather events, sea ice, and permafrost will have implications for terrestrial and marine ecosystems, which in turn have consequences for the health and well-being of the numerous coastal communities in the region. All communities in the Arctic will be affected as they rely on the services of healthy ecosystems for hunting, fishing, local economic enterprises, as well as for physical and mental health. The seaways enable bulk maritime re-supply with essential north/south and international economic connections that are fundamental to domestic and international trade. There is also a strong and vibrant Indigenous presence in many communities across the Arctic where cultural networks transcend national borders, where travel over water and importantly over sea ice has occurred for thousands of years, and where connections to a healthy ocean are entwined in the cultural fabric and well-being of local society.

## SOVEREIGNTY, SECURITY AND SUSTAINABILITY

The changing Arctic Ocean also has major implications for global security, national sovereignty, and international trade related to: increased access to new global marine trade and transportation routes; lengthened ice-free shipping seasons; and increased opportunities and pressures related to Arctic tourism, Arctic fisheries and natural resource development. It is predicted that climate-related changes to the Arctic regions could stimulate investments ranging from US\$ 85-265bn over the next decade, offering the potential for significant and long-term sustainability opportunities for communities and governments in the region. However, with these largely climate change-induced socio-economic changes come increased potential risks such as: oil spills, shipping disasters and environmental contamination with subsequent public health risks, as well as the potential for the introduction of invasive species. There are also ramifications for search and rescue operations, human safety, mortality, and morbidity, together with impacts to infrastructure and livelihoods in the North. There are also risks related to local capacity, whereby larger global forces may overwhelm and impede locally led initiatives.

While the Arctic marine environment sustains unique and globally important ecosystems, it remains among the least-understood basins and bodies of water in the world. This lack of scientific understanding is concerning, as changes to the Arctic Ocean have complex and wide-reaching biophysical implications for local and global environmental processes. They also have significant repercussions for the health and well-being of local communities, and they could influence the future of global maritime trade, and with it, the potential for altered global power relations.

### SHARING A SCIENTIFIC VISION FOR PEOPLES AND MARINE ENVIRONMENTS

The G7 Academies stress the critical need to support and enhance basic Arctic research endeavours and cooperation that promote healthy and thriving coastal communities in the context of changing ocean systems. To address this need, the G7 Academies propose a vision of broad international collaboration that includes natural, social, and health sciences, engineering, humanities, and Indigenous knowledge in order to:

- Understand how climate change and human activities impact vital Arctic ecosystems;
- Develop innovative and interdisciplinary approaches and technologies to address these challenges;
- Use this knowledge to enable rich and robust evidence-based decision-making to inform decisions and manage and minimize environmental and sociological impacts.

## THE G7 ACADEMIES RECOMMEND:

### 1. Research Cooperation

- Funding considerably more international and interdisciplinary research, including Indigenous knowledge, in both natural and social sciences to ensure that sound scientific, environmental and societal decisions are made for future development and the well-being of all;
- Developing innovative conservation and governance approaches to support the health and well-being of Arctic ecosystems.

### 2. Building Science Capacity

- Training individuals from a diversity of fields and backgrounds that will ensure the necessary expertise is available internationally;
- Training those residing in the Arctic is essential: this will incorporate locally-driven science questions and foster development of circumpolar research infrastructure.

### 3. Accessibility of Information

- Develop interoperable and open data-sharing platforms and sample-archiving systems;
- Provide appropriate communication infrastructure that enables information sharing in a timely manner and is usable by diverse communities.

### 4. Enhanced and Linked Remote Sensing and in-situ Monitoring Programs

- Continue high-inclination satellite missions dedicated to monitoring long term changes in terrestrial ecosystems, as well as in ice and ocean conditions; this would also ensure safe and optimal navigation across the Arctic;
- Extend the development of research vessels, and autonomous vehicles, platforms, cabled observatories and sensors that operate in open water, under the sea ice and on the ocean floor;
- Integrate these broader scale systems with regionally-integrated in-situ monitoring programs that incorporate local knowledge.



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# HOW TO SUPPORT THE RSC

## OPPORTUNITIES FOR GIVING

The Royal Society of Canada is a Charitable Organization, (Charitable Reg. #10793 5991 RR0001). Donations and Sponsorships from both private and corporate entities enable the Royal Society of Canada to pursue its core mission and mandate.

### ANNUAL FUND

The Annual Fund enables the RSC to enhance programmes and activities to achieve the objectives of the strategic plan.

## WALTER HOUSE

The headquarters of the RSC is funded exclusively by the membership. Support for the home of the membership enables our heritage home to serve as a convening hub.

### PLANNED GIVING OPTIONS

For individuals interested in legacy giving please contact us.

For further details on how you can become an RSC supporter, please contact Darren Gilmour, Executive Director at 613-991-6990 Ext. 101 or [dgilmour@rsc-src.ca](mailto:dgilmour@rsc-src.ca).

## FINANCIAL STATEMENTS

The RSC's fiscal year runs from July 1 to June 30. The Financial Statements have been prepared in accordance with Canadian accounting standards for not-for-profit organizations and audited annually by Deloitte. The financial statements are available online at [www.rsc-src.ca](http://www.rsc-src.ca).

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