



The Royal Society of Canada

Annual Report 2019






RSC SRC

THE ENDURING MISSION OF THE RSC

In order to establish the foundation for multiple initiatives, the Royal Society of Canada elects Fellows and Members while also presenting awards to highlight specific exceptional achievements. After rigorous evaluation and review of their accomplishments, leading individuals may be elected to one of the Society's three Academies—the Academy of Arts and Humanities; the Academy of Social Sciences; and the Academy of Science. There are currently 2372 RSC Fellows. As a complement to the Academies, the RSC established The College of New Scholars, Scientists and Artists in 2014. The College recognizes individuals who have begun demonstrating leading scholarly, research or artistic excellence within 15 years of having completed their post-doctoral program or its equivalent. Members of the College are elected for a period of seven years. There are currently 325 Members of the College.

In addition to Fellows and Members of the College, the RSC includes Institutional Members from throughout Canada that play key roles in advancing inclusive excellence for the benefit of Canada and the world. The RSC administers over 20 prestigious awards, most of which are awarded to those at various career stages in recognition of outstanding achievement.

As emphasized in our by-laws, the RSC recognizes leaders in order to help them build a better future in Canada and around the world. For this reason, the RSC fulfills its mandate successfully to the extent that it recognizes excellence and then mobilizes the membership to make significant and substantial contributions of knowledge, understanding, and insight through engagement with the larger society.

RSC SRC

MESSAGE FROM THE PRESIDENT

CHAD GAFFIELD

In planning for, undertaking and now concluding my mandate as RSC President, I have kept in mind future assessments of our efforts to help Canada and the world make a better future. What is the "extent and value" of our contributions to the "welfare of the country"? Indeed, this question was explicitly posed in 1932 as the Royal Society of Canada celebrated its fiftieth anniversary. The RSC's leaders took stock of what had been accomplished over the previous decades to support Canada's transition from colony to nation. In a series of "surveys of progress in Canada," RSC members focused on wide-ranging aspects of Canada's changing economic, social and cultural life during the later nineteenth and earlier twentieth centuries. Taken together, the impact of the RSC was shown to be transformative. As the RSC editors of *Fifty Years Retrospect* concluded, "The whole constitutes a striking proof of the dominating part taken by the Fellows of the Royal Society in the intellectual and scientific life of the Dominion for a half a century, and of the extent and value of the contributions made by the Society and its members to the welfare of their country." In looking back on 2019, my sense is that the RSC has built significantly on past achievements, thanks to the talent and devotion of members across Canada and beyond.

The following pages highlight some of the compelling ways that the RSC Strategic Plan has continued to successfully focus and guide our work. The Plan's redefining of excellence as *inclusive excellence* has laid a strong foundation for ensuring that the leaders of specific initiatives were well-prepared to achieve optimal success. The RSC's historic advantage of including all fields from sciences and engineering to the social sciences and arts and humanities is proving to be increasingly important as global issues such as environmental change and digital transformations make clear that no specific expertise can fully address any major issue. This year's G7 Academy focus on, for example, AI and Society illustrated the RSC's quite unique ability to draw upon diverse epistemologies and metaphysics in helping draft the formal Statements addressed to decision-makers.

Moreover, this past year emphasized again how the RSC's distinct multi-generational capacity accelerates the impact of valuable new perspectives and approaches to deeply complex issues. RSC College members continued to work shoulder-to-shoulder with RSC Fellows and partners to develop robust initiatives such as the "Science, Trust and Democracy in the Digital Age" symposium program that attracted a full-house audience to examine issues at the heart of Canada and the world's future. This symposium also featured significant attention to the challenges and opportunities of drawing upon distinct knowledge systems especially those based in western European traditions and in Indigenous knowledge systems.

Taken together, these examples illustrate the essential importance of embracing inclusive excellence, and they strengthen the foundation of the Strategic Plan's call to increase our contributions to public debate and decision-making. I look forward to continuing to do all I can to support the RSC in future years. Many, many thanks to everyone who has contributed so much from the high-performance team at Walter House to Council colleagues, devoted RSC members, enthusiastic partners, and friends around the world.

Chad Gaffield
President

MESSAGE FROM THE EXECUTIVE DIRECTOR

DARREN GILMOUR

Roughly two-thirds of the RSC's organizational and operational energy is devoted to the delivery of our "core business", the processes leading to the recognition of outstanding scientific, scholarly and artistic contributions across the disciplines and across the generations. A third of our collective energy is driven into a change agenda as articulated by the 2018-2022 RSC Strategic Plan: *Mobilize, Catalyze, Sustain.*

Building on the first-year gains in implementing our strategic plan, 2019 provided opportunities to lengthen our stride as we seek to go further, together.

Our operational areas of focus in *mobilizing the membership* included the enhancement of existing activities, especially the Celebration of Excellence and Engagement. After years of visiting two coasts and many cities in between, the COEE is this year being held in Ottawa, and our wonderful web of partnership support has considerably enhanced this must-attend set of 27 events focused on the exchange of insights and evidence. This year we have established a new ceiling, with only 600 registrants! The change agenda in *mobilizing* has been embodied by the increasing number and impact of RSC branches. RSC Atlantic continued its record of excellent contributions, while SRC Québec and RSC Pacific further enhanced their impact by broadening the reach of their activities. The possibilities of RSC Prairies-North were meaningfully explored throughout the summer, and RSC@ Massey was launched on October 28.

In *catalyzing new contributions*, the RSC sharpened its focus for contributing science advice to policy and public discussions by publishing *Next Steps in Sustainable Science Advice in Canada*, an RSC Position Paper that built on previous Position Papers in its emphasis on support of the institutionalization of the office of the Chief Science Advisor. Our web presence and digital strategy grew to include steady activity on Twitter celebrating the contributions of the membership, and the RSC website hosts a comprehensive set of corporate publications as well as individual "voices" contributed by Members. The Committee on Public Engagement has been focused on enhancing our impact by identifying specific themes that address issues in the larger society and inviting scholarly inputs. The year will close with the publication of the first in a series of RSC *Policy Briefings*, which revisit the context, findings and recommendations of an RSC Expert Panel report, track the public-policy developments since publication, and identify the policy challenges that lie ahead. The inaugural RSC Policy Briefing is *Sustaining Canadian Marine Biodiversity.*

Throughout 2019, our focus on *sustaining momentum* has been in continuing improvement on governance, management and the nomination and selection of new RSC members. The Standard Operating Procedures of the Academies and the RSC College are online, and the TOR of the Standing Committees of the Board have been updated. The orientation process for incoming Board and Council members embraces best practices, and HR policy updating and performance review processes exceed industry standards.

As the literal embodiment of our efforts to *sustain momentum*, 282 Somerset Street is thriving hub of activity, convening communities and conversations throughout the year. With a multi-year facility improvement plan in place, sustainable financing—and a handsomely increased market value for the facility itself—the home of the RSC, just like the Walter House team working tirelessly to advance the RSC mandate, has its head turned toward the sun.

Darren Gilmour
Executive Director

Activities

G7 Research Summit: Science, Trust and Democracy in the Digital Age 6
The Year in Pictures 8
Voices of the RSC 13
Celebration of Excellence & Engagement: Halifax 2018 14
Celebration of Excellence & Engagement: Ottawa 2019 15

Members

Class of 2019: New Fellows 19
Class of 2019: New College Members 33
Class of 2019: Medal & Award Winners 39
Institutional Members 42
In Memoriam 43

Publications

RSC Position Paper: The Next Steps for Sustainable Science Advice in Canada 44
G7 Statement: Artificial Intelligence and Society 45
G7 Statement: Citizen Science in the Internet Era 46
G7 Statement: Science and Trust 47
Policy Briefing Committee Report: Sustaining Canadian Marine Biodiversity 48

Strategic Plan 5
Branches of the RSC 5
How to Support the RSC 52

BOARD OF DIRECTORS • NOV. 2018-NOV. 2019

President
Chad Gaffield

President Elect
Jeremy McNeil

Vice-President (Academy of the Arts and Humanities)
Jean Grondin

Vice-President (Academy of Social Sciences)
Alain G. Gagnon

Vice-President (Academy of Science)
Vijaya Raghavan

Vice-President (College of New Scholars)
Joanna Quinn

Secretary
Sheila Embleton

Treasurer
Jean-Marie Toulouse

Institutional Member Representative
David Barnard

External Member
Chris Loreto

STRATEGIC PLAN 2018-2022

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 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

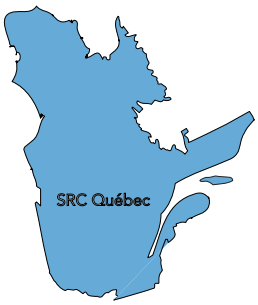
The success of the RSC over the past 135 years has reflected continuing efforts to renew and grow in keeping with the changing times. The objective of this priority is to ensure that near-term goals and activities are informed by a long-term vision to ensure the enduring success of the RSC.

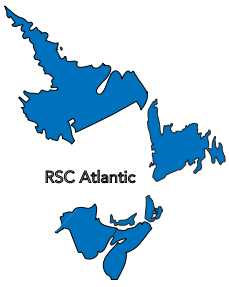
BRANCHES OF THE RSC

FROM COAST TO COAST TO COAST

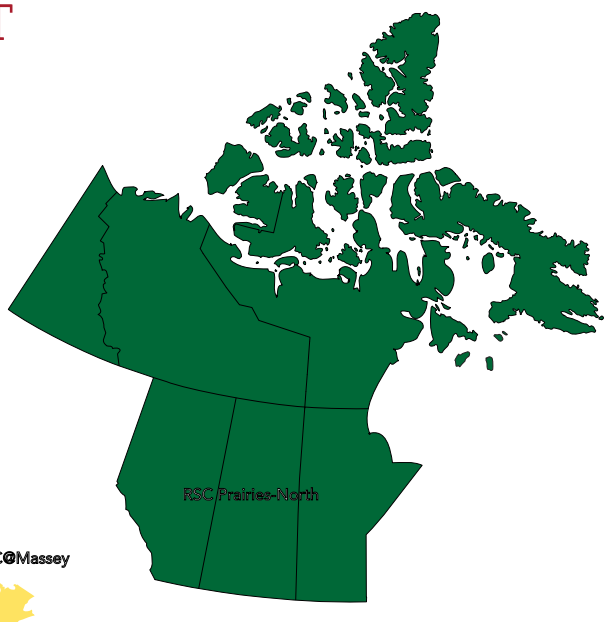
Branch initiatives enable the RSC community, as well as new and existing stakeholders and community institutions to engage more directly and dynamically in their distinct geographic areas.

RSC Atlantic was established in 2008. Based on the success of this program the RSC has, since then, expanded with branches established in the Pacific region, in Quebec, in the Prairies and the North, and in Southern Ontario.





Public events are frequently being organized by each of the RSC branches. Watch for events in your region on the RSC Events page and on your Twitter feed @RSCTheAcademies!



UNIVERSITY OF TORONTO

The RSC is grateful to the University of Toronto for its support in establishing RSC@Massey.

SCIENCE, TRUST, AND DEMOCRACY IN THE DIGITAL AGE

G7 RESEARCH SUMMIT, SEPTEMBER 2019, OTTAWA, ONTARIO

For 15 years, the science academies of the G7 countries have been advising heads of state and government in the lead-up to the annual summits. Before each summit, the national science academies of the G7 study urgent global challenges relating to the summit agenda, and prepare statements from a global perspective to submit to the political leadership for consideration at the summit. The objective is to provide independent and collaborative scientific input. Over the years, statements have covered such issues as antibiotic resistance, disaster resilience and Arctic sustainability.

The G7 science academies developed a three-year plan for 2018-2021 in which key themes, such as "Our Digital Future" from 2018, are sustained in the following year—for example by "Artificial Intelligence" and "Citizen Science" in 2019. Elements of these themes will also inform the G7 agenda for 2020, providing the G7 Academies with increasing opportunity for engagement and impact. These themes endure because they are widely recognized as global challenges as well as challenges that benefit specifically from independent scientific advice. In addition, these themes present opportunities for the G7 president country to highlight pronounced research strengths.

Over the course of two days in September 2019, the RSC convened 200 scholars, citizens, scientists and public policy practitioners from Canada, France and the United States to elaborate upon portions of the statements of the 2019 G7 Academies.

Day 1

The first day of the symposium emphasized the importance of enhancing trust and further democratizing knowledge. Michelle Lamont of Harvard University emphasized that the word 'science' is not democratic—it is an acquired knowledge by a selected few relative to the general population. At the same time, citizen science has become increasingly important as volunteers from across society

Her Excellency Kareen Rispal, Ambassador of France in Ottawa, welcomed guests.

contribute scientifically to large-scale research initiatives. In this context, CNRS President Antoine Petit emphasized the need for more multidisciplinarity within the sciences and more humility from scientists in explaining and communicating their knowledge.

Day 2

Day 2 of the symposium opened with a keynote from two Canadian scholars who emphasized the urgency of embracing all forms of knowledge, and indeed the need to expand our too-rigid classification of "science". Today, researchers acknowledge the interconnections of all living things with a pronounced respect for their histories, and for the intergenerational transfer of knowledge.

A case of landscape-burning over the centuries by indigenous peoples highlighted the challenges inherent in capturing traditional knowledge faced with modern practices. Speakers gave the example of how, a century ago, government officials banned indigenous peoples

Over 300 people attended the G7 Research Summit at the University of Ottawa, and enjoyed presentations such as this one featuring (L to R): Monica Gattinger, Antoine Petit, Michèle Lamont, and Jacques Frémont.

from setting fires strategically to manage wildfires. Today, experts all agree on the importance of such tactics. This is just one example of the efforts underway to integrate historically different knowledge systems in order to benefit all societies. This was just one example of the ways in which indigenous knowledge must not stand in the shadow of western knowledge.

The panel discussion that followed was an inter-generational session highlighting how current economic and technological changes have short-term impacts that may be overestimated and longer-term impacts that may be underestimated. While certain dimensions of work can be best handled via AI, the role of humans in interpreting results and shaping decisions will remain crucially important.

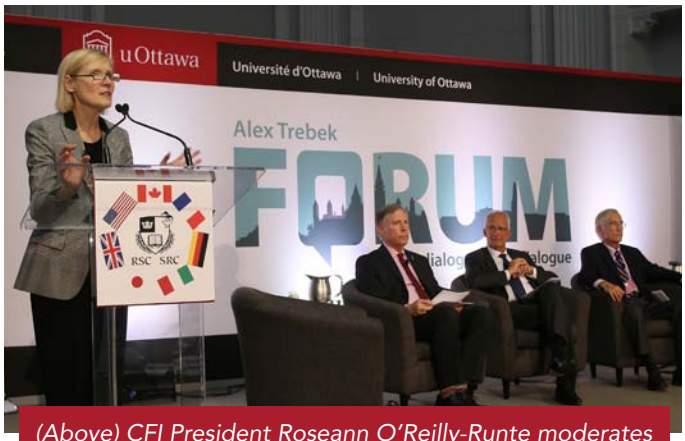
In her presentation, Dr. Mona Nemer, Canada's Chief Science Advisor, drew a parallel between AI and the genomics revolution, underscoring the need for ongoing and inclusive dialogue as well as humility. It is imperative, Dr. Nemer emphasized, that ethical, legal and social questions be addressed at the outset, rather than after the fact. In addition, communicating well beyond the boundaries of the "research bubble" is critical, especially due to the inability to predict the consequences of change.

"I am reflecting on the marvel of sitting in the former Chapel at the University of Ottawa, at a session convened by the Royal Society of Canada and Embassy of France to listen to Indigenous ways of knowing and hearing a language on the edge of extinction.

A great contribution to Canada, and a symbol of how much we are changing as a country.

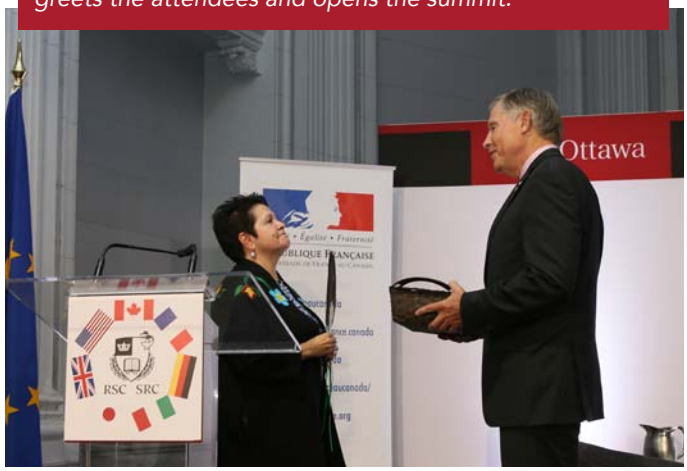
And the next session on AI and the future of work will stretch us in a different direction!"

–Paul Davidson, President, Universities Canada



(Above) CFI President Roseann O'Reilly-Runte moderates a session reflecting on G7 themes and the impact of the academies, featuring (L to R) Chad Gaffield, RSC President; Pierre Corvol, President, Académie des sciences (France); and John Boright, Executive Director, International Affairs of the US National Academies.

(Below) Elder Claudette Commanda, Algonquin Anishinabe from Kitigan Zibi Anishinabeg First Nation, greets the attendees and opens the summit.



THE YEAR IN PICTURES

EVENTS AND ACTIVITIES IN 2019

Navigating Your Journey
October 26, Saint John, New Brunswick
RSC Atlantic, along with NaviCare/SoinsNavi's Family Advisory Council, coordinated the Navigating Your Journey *workshop developed for families with children and youth with complex care needs.*

RSC@Massey Inaugural Reception
October 28, Massey College, Toronto
Massey College hosted the inaugural RSC@Massey Event, including welcomes from (l to r) Chad Gaffield, Massey Principal Nathalie Des Rosiers, and University of Toronto Vice-President Vivek Goel.

Thaddeus Holownia Art Display
October 20, New Brunswick Museum
RSC Atlantic organized an exhibition of the work of artist and Mount Allison Professor Thaddeus Holownia, pictured with Gwen Davies.

2019 Romanowski Lecture Series: Lenore Fahrig
October 16, Montreal Science Centre
October 17, Redpath Museum
November 5, Ontario Science Centre
November 22, Chateau Laurier
Lenore Fahrig (third from left) delivered the 2019 Romanowski Lecture Series, titled Small Spaces Pack a Big Punch for Biodiversity.

Science and Technology in Society Forum
October 6-8, Kyoto, Japan
Chad Gaffield met with Patrick Flandrin (left), Vice-President of the French Academy of Sciences and John Hildebrand (right), Foreign Secretary of the National Academy of Sciences in the United States.

RSC Prairies-North Launch Event
July 4, University of Saskatchewan
The RSC Prairies-North Branch launched with a series of presentations from local members, including Ingrid Pickering (pictured).

2019 Listening Tour
July 2-5, Saskatoon, Saskatchewan
The 2019 Listening Tour was in Saskatoon and visited sites such as the (clockwise from top left) Wanuskewin Heritage Park, the Native Law Centre of Canada, the University of Saskatchewan Aquatic Toxicology Research Facility, and Canadian Light Source.

Change Your World
June 13, Halifax Central Library, Halifax
Michael Ungar launched his new book Change Your World *at an RSC Atlantic event at the Halifax Central Library.*

Science, Scholarship, and Democracy: Congress 2019
June 5, The University of British Columbia
Joanna Quinn, Bonnie Schmidt, and Chad Gaffield discussed Science, Scholarship, and Democracy *at Congress 2019.*

Vancouver Island University Reception
May 10, Walter House, Ottawa
The RSC celebrated the VIU community with a reception at Walter House. Pictured above are (l to r): Michael Mahon, Ralph Nilson, VIU President Deborah Saucier, Michael Hawes, and Darren Gilmour.

Transitions: Humboldt Association of Canada Kolleg
May 9-11, University of Ottawa
The RSC participated in the Humboldt Association of Canada Kolleg on "Transitions". Alan Steele (above) presents on transition of the International System of Units (SI) and the New Definition of the Kilogram.

Ways of Knowing in our Dramatically Changing World
May 9, Government House, Victoria
RSC Pacific was welcomed by the Honourable Janet Austin, Lieutenant Governor of British Columbia, pictured above with organizers Graeme Wynn and Cynthia Milton. The event featured a seminar and reception at Government House, including presentations from Sara Ellison, Philippe Tortell, and Val Napoleon.

Science and Society in an Era of Pluralism
April 18, Université de Montréal
SRC Québec organized an event on science and society featuring presentations from Yoshua Bengio, Océanne Jasor, and Michel Jébrak.

Eastern Ontario Regional Seminar
April 13, Queen's University
The annual Eastern Ontario Regional Seminar organizers and speakers (l to r): Amir Fam, Jamie Benidickson, Joan Schwartz, John McGarry, Heather Stuart, and John Burge.

Acadians of the Saint John River Speaker Series
April-October, Governement House, Fredericton
RSC Atlantic held a bilingual conference series over six months looking at the Acadians of the Saint John River. Pictured (l to r) is Bernard-Marie Thériault, Chantal Richard, and Fidèle Thériault from May.

Gender and Water Quality: Women do most of the work!
March 22, Carleton University
RSC Fellow Frances Henry (centre) gave a presentation for a World Water Day event hosted by the Global Water Institute. Pictured here with Marie D'Iorio and Banu Örmeci.

IAP Conference and General Assembly
April 8-11, Songdo, Korea
Chad Gaffield and Jeremy McNeil attended the annual conference and general assembly of the IAP (Interacademy Partnership) in Songdo, Korea.

Medically-Assisted Dying: Next Steps for Canada
March 15, Chateau Laurier, Ottawa
Jocelyn Downie (above) addressed the challenges and opportunities for the future of medically-assisted dying in Canada. RSC Past President Bill Leiss (below, left) launched the RSC Expert Panel report on End-of-Life Decision Making that was published in 2011.

G7 Academy Meetings
March 21-29, Paris, France
Parvin Mousavi (pictured) joined Chad Gaffield and Marie D'Iorio as the Canadian contingent at the G7 Academy meetings in Paris, France, where the G7 Statements were finalized.

The Future of Oceans
March 15-16, St. John's, Newfoundland
In collaboration with Memorial University and For a New Earth (FANE), RSC Atlantic held a two-day symposium on the Future of Oceans to bring together panelists from multiple sectors to imagine the best future for oceans. Maxime Geoffroy (pictured) presents at the symposium.

G20 Academy Meetings
March 6, Osaka, Japan
Vijaya Raghavan represented Canada and the RSC at the G20 Science meetings in Osaka, Japan.

RSC Pacific Reception
February 21, Peter Wall Institute, UBC
RSC Pacific hosted a reception for new Members, which featured presentations of Members' work, including a dramatic reading led by College Member George Belliveau (right).

RSC College Winter Planning Meeting
February 21, Peter Wall Institute, UBC
The 2019 RSC College Winter Planning Meeting was hosted by the Peter Wall Institute for Advanced Studies at The University of British Columbia.

Memory Institutions in the Digital Age
December 5, Library and Archives Canada, Ottawa
In partnership with Library and Archives Canada, SSHRC, and the CCA, the RSC hosted a G7 Research Summit reflecting on the 2018 G7 statement and the 2014 RSC Expert Panel. The Chair of the Expert Panel Patricia Demers presents at the event (above). Below (l to r): Ted Hewitt, Janine Marchessault, Eric Meslin, Christina Tessier, Chad Gaffield, Guy Berthiaume, Leslie Weir, Robert McIntosh, Patricia Demers, Doug Owram.

History in the Public Interest
January-April, Walter House, Ottawa
For the first time, Walter House was the site of a graduate course. Taught by RSC College Member Jennifer Evans of Carleton University, the applied history course met at Walter House and made use of the RSC archives.

Millbrook Cultural & Heritage Centre
November 14, Truro, Nova Scotia
The RSC TRC Committee led a visit to the Millbrook Cultural & Heritage Centre during the 2018 COEE weekend in Nova Scotia. Pictured (l to r): Gonia Jarema, Laura Loewen, Constance Backhouse, Reem Bahdi, Sheila Embleton, John Reid, Maryse Lassonde, James Walker, Christl Verduyn, Joanna Quinn, Russel MacDonald, Fuyuki Kurasawa, Tony Embleton, and Cynthia Milton.

Enabling Interdisciplinarity for the Next Generation of Problem Solvers
November 8, Canadian Science Policy Conference, Ottawa
College Secretary Steven Cooke led an RSC panel at the 2018 CSPC on interdisciplinarity, including (l to r): Shohini Ghose, Vivian Nguyen, and Andrea Reid.

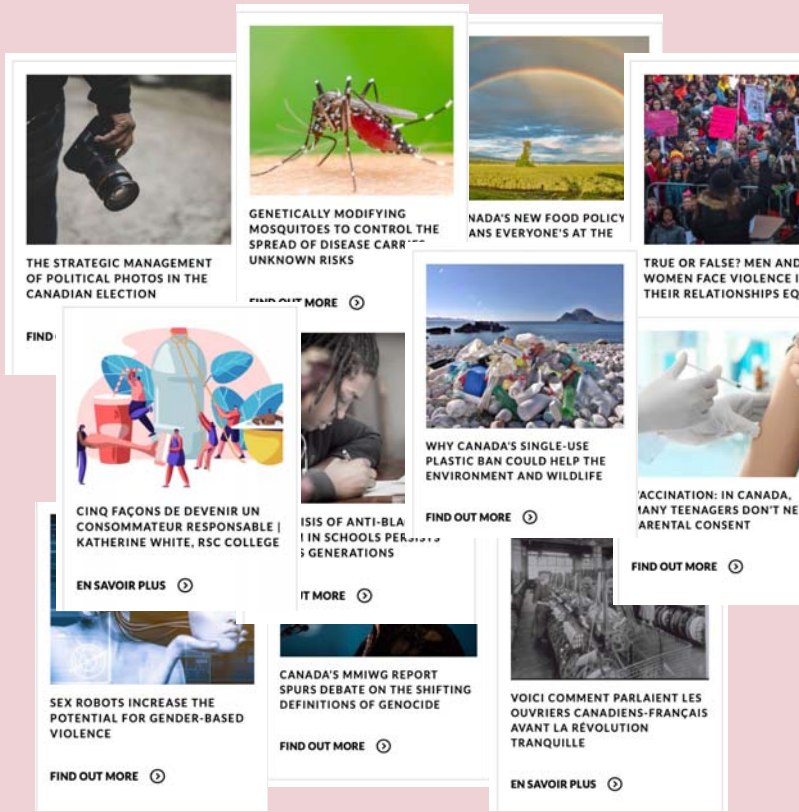
Visit from Royal Society Te Apārangi
November 6, Walter House, Ottawa
President Wendy Larner and Chief Executive Andrew Cleland from the Royal Society Te Apārangi in New Zealand visited the RSC at Walter House.

VOICES OF THE RSC

The RSC collects and publicizes journalistic and scholarly articles written by its Members, seeking to further share and spread the impact and knowledge of the RSC community.

Articles are usually republished from other sources on matters in the public interest, and written by Members with expertise in the topic in question. Opinions are those of the authors, who are encouraged to use their voice.

All Voices of the RSC articles are available online.



LOOKING BACK: COEE 2018

NOVEMBER 15-18, HALIFAX, NOVA SCOTIA

The 2018 Celebration of Excellence & Engagement was held in Halifax, Nova Scotia. The weekend saw the induction of 77 Fellows and 41 Members of the College, and the RSC honoured 18 medal and award winners. Highlights from the weekend were:

Speed Meetings

Members gathered in interdisciplinary and intergenerational small groups and posed a series of thought-provoking questions. Responses were discussed with the room, before the groups were shuffled and a new question posed. The event culminated in a visit from Canada's Chief Science Advisor, Dr. Mona Nemer.

Festival of Ideas

Members were invited to share their work with their colleagues through visual and multimedia demonstrations, and the event was interspersed with brief presentations. Christl Verduyn (below) shares some of the work RSC Atlantic has done over the years.

Annual Gala & Kitchen Party

The RSC's Annual Gala celebrated a successful year and was followed by an Atlantic *Kitchen Party*.

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.

DALHOUSIE UNIVERSITY
Queen's University
NRC·CNRC
Western
UNIVERSITY OF TORONTO
UNIVERSITY OF CALGARY
uOttawa
Canada Council for the Arts | Conseil des arts du Canada
SFU SIMON FRASER UNIVERSITY ENGAGING THE WORLD
canarie
FACETS

CELEBRATION OF EXCELLENCE & ENGAGEMENT 2019

NOVEMBER 20-24, OTTAWA, ONTARIO

HIGHLIGHTS OF THIS YEAR'S PROGRAMMING

Senate Tour – Senate Building

Thursday, November 21, 4:25-5:30pm

The Senate of Canada Tour Canada's Upper Chamber has a temporary new home! Come explore the Senate on the grounds of the old train station in downtown Ottawa while Parliament's Centre Block undergoes its first complete overhaul since the building opened in 1920.

Romanowski Lecture Series – Adam Ballroom

Friday, November 22, 7:30-9:00am

This lecture provides a forum for discussion of some of the greatest challenges facing the environment, and research that is contributing to addressing these challenges. This 2019 Romanowski Lectures are delivered by Lenore Fahrig, winner of the 2018 Romanowski Medal.

Induction of New Fellows – Ballroom

Friday, November 22, 2:00-5:00pm

This ceremony welcomes new RSC Fellows into the Academies of the Society. During this event, new Fellows sign their names into RSC's original and historic Charter Book and are presented with a Diploma and a RSC lapel pin.

Festival of Ideas – Laurier Room/Ballroom/French Corridor

Saturday, November 23, 11:00am-4:00pm

The Festival of Ideas provides an arena where RSC Fellows and Members can present their research—whether through a visual display, a multimedia presentation, or a book display (or other formats: use your imagination!). Friends and partners of the RSC also have space in the festival to promote engagement opportunities.

Pub Night & Trivia – Mill Street Brew Pub

Thursday, November 21, 9:00pm-12:00am

Sitting within the LeBreton Flats area of the city and beside the beautiful Chaudière Falls, the Mill St. Brew Pub is the oldest surviving stone mill building in Ottawa, built in 1842. Pub Night provides the community with an atmosphere to continue conversations and to test their knowledge with a live trivia game.

Presentation of New Members of the College – Ballroom

Friday, November 22, 10:45am-12:00pm

This ceremony welcomes new Members of the College in a format that showcases the interdisciplinary character of the College.

Ottawa Haunted Ghost Bus Tour – Meet in Lobby

Friday, November 22, 8:30-10:30pm

Best known for their award-winning evening walking tours, Haunted Ottawa leads its guests by lantern-light to well known locations and share Ottawa's ghost stories and darker history. Since it can be quite cold in November, we will travel by the Ghost Bus between locations! Bus departs the Château Laurier at 9:00 pm.

G Science Breakfast: Marine Biodiversity – Laurier Room

Sunday, November 24, 8:00-9:30am

The RSC represents Canada in the annual deliberations of the G7 and G20 Science Academies, and a recent theme for these deliberations is the future of oceans. The RSC has struck a committee to look back on its 2012 Expert Panel report on Marine Biodiversity, and consider next steps. Panel chair Jeffrey Hutchings leads the new committee, and presents their findings here.

THURSDAY, NOVEMBER 21, 2019		
7:30am - 8:30am	Symposium Registration	French Corridor
8:00am - 4:30pm	Science, Trust and Society: Inclusive Culture Under Siege • 2019 Symposium	Ballroom
4:00pm - 5:00pm	Senate of Canada Tour (Ottawa's old train station)	Hotel Lobby
5:30pm - 8:00pm	Networking Dinner and Reception *A buffet dinner with open seating arrangement, informal and focused on enabling connections with old and new friends.*	Laurier Room
9:00pm - 12:00am	Pub Night *The Mill Street Brew Pub will open its doors exclusively to the RSC community, includes a complimentary sample and pub trivia*	Mill Street Brew Pub
FRIDAY, NOVEMBER 22, 2019		
6:00am - 7:00am	Walk Jog Run – Rideau Canal Route *A fresh air jaunt along the Rideau Canal*	Hotel Lobby
7:30am - 9:00am	Romanowski Breakfast Lecture *"Small Spaces Pack a Big Punch for Biodiversity" by Lenore Fahrig*	Adam Ballroom
8:30am - 9:00am	Medal & Awards Orientation Session **Medal and Award Winners Only**	Laurier Room
9:00am - 10:30am	Medal & Awards Ceremony	Laurier Room
10:00am - 10:30am	Orientation Session for New Members of the College **New College Members Only**	MacDonald Room
10:45am - 12:00pm	Presentation of New Members of the College	Ballroom
12:00pm - 1:30pm	Celebration Lunch *All guests are invited to a lunch to celebrate the accomplishments of new Fellows, new College Members, and Medal & Award winners*	Adam Ballroom
1:30pm - 2:00pm	Induction Orientation for Fellows **New Fellows Only**	Laurier Room
2:00pm - 5:00pm	Induction of New Fellows	Ballroom
5:00pm - 6:00pm	Cocktail Reception *The opportunity to celebrate the Class of 2019*	French Corridor
	Dinner on your own	
6:00pm - 8:00pm	Atlantic Après-Dinner Reception	Laurier Room
8:00pm - 10:30pm	Science, Art & Creativity Symposium *This panel discussion and audience engagement will explore the nature of creativity and the creative process*	Adam Ballroom
8:30pm - 10:30pm	Ottawa's Haunted Walk – Ghost Bus Tour	Hotel Lobby

SATURDAY, NOVEMBER 23, 2019		
6:00am - 7:00am	Walk Jog Run – Parliament Hill Route *A fresh air jaunt along the Parliament Hill*	Hotel Lobby
7:30am - 10:30am	Academy Meetings • *Academy of the Arts and Humanities* • *Academy of Social Sciences* • *Academy of Science* *Includes breakfast and plenary speaker, College Members welcome*	• Renaissance Room • Québec Suite • Adam Ballroom
10:30am - 12:00pm	RSC College Meeting	MacDonald Room
11:00am - 4:30pm	Festival of Ideas: All Members *Lightning Talks, Book Exhibits, Performances, Poster Sessions & more*	Ballroom / Laurier Room / French Corridor
12:00pm - 2:00pm	New Member Presentation Cafés **all disciplines* *New members share their work in six-minute "Lightning Talks"*	Ballroom
3:00pm - 4:00pm	RSC Nomination Workshop *All university administrators and interested members are invited*	Québec Suite
3:00pm - 4:30pm	Annual General Meeting *RSC members formally review finances, consider proposed By-law changes, and elect the Board of Directors*	MacDonald Room
6:00pm - 7:00pm	Pre-Gala Reception	Shaw Centre: Level 2
7:00pm - 9:00pm	RSC Gala Dinner *An evening of fine dining and celebration of the year's achievements*	Shaw Centre: Ottawa Salon
9:00pm - 12:00am	RSC After Party *Time to dance!*	Shaw Centre: Gatineau Salon
SUNDAY, NOVEMBER 24, 2019		
8:00am - 9:30am	G Science Breakfast: Marine Biodiversity *Presentation from Dr. Jeffrey Hutchings*	Laurier Room
9:30am - 11:00am	College Programming	MacDonald Room
11:00am - 2:00pm	CSP Open Access Summit *Canadian Science Publishing is convening a workshop to gath perspectives in order to develop a made-in-Canada model of sustainable open access publishing*	Laurier Room

SPONSORS

The RSC would like to thank all of the institutions whose support make the 2019 Celebration of Excellence & Engagement possible. In particular, special thanks to 2019 Presenting Sponsors the University of Ottawa, Carleton University, and the National Research Council.

uOttawa
Carleton University
Canada's Capital University
National Research Council Canada
Conseil national de recherches Canada
University of Waterloo
Western
Dalhousie University
Innovation.ca
University of Calgary
University of Toronto
Vancouver Island University

Repousser les limites

Pushing boundaries

L'Université d'Ottawa félicite ses 11 nouveaux membres de la Société royale du Canada.

The University of Ottawa congratulates its 11 new inductees to the Royal Society of Canada.

recherche.uOttawa.ca | research.uOttawa.ca

uOttawa

Carleton University Congratulates Inductees into The Royal Society of Canada

Carleton University is proud to sponsor the Royal Society of Canada's Celebration of Excellence and Engagement. Congratulations to Carleton professors Norman Hillmer and Robert Letcher for their induction as new Fellows of the RSC.

Carleton is home to exceptional researchers having an impact in Canada and around the world. Learn more at: research.carleton.ca

Carleton UNIVERSITY

NRC·CNRC

GREAT MINDS. ONE GOAL.
CANADA'S SUCCESS.

DE GRANDS ESPRITS.
UN SEUL BUT.
LA PROSPÉRITÉ DU CANADA.

Congratulations to the new Members and Fellows of the Royal Society of Canada

Félicitations aux nouveaux membres de la Société royale du Canada et du Collège

National Research Council Canada | Conseil national de recherches Canada

Canada

ACADEMY OF THE ARTS AND HUMANITIES

Division of Humanities

BEYER, Peter – Faculty of Arts, University of Ottawa

Peter Beyer has over the past decades become the foremost international expert on the relation between religion and globalization. Along the way he has introduced innovative developments in sociological theory of religion in the global context, and produced ground-breaking empirical research on religious and cultural diversity in Canada, the religious expression of Canada's post-1970 immigrants and second generations, as well as contributed to Canadian and French-Canadian religious history.

BHATT, Vikram – Peter Guo-hua Fu School of Architecture, McGill University

Vikram Bhatt, is an internationally recognized expert in the field of sustainable housing and human settlements design. His action research and practical interventions are affordable and culturally appropriate. His pioneering work on edible landscapes and urban agriculture has focused on food security and successfully transformed neighborhoods and cities around the globe improving lives of ordinary people.

BOLD, Christine – School of English and Theatre Studies, University of Guelph

Christine Bold is acclaimed for numerous innovative, influential publications on North American popular and public cultures, especially of the nineteenth and twentieth centuries. Through extensive archival study, university-community collaborations, and settler-Indigenous research relationships, her work illuminates hidden histories of popular print, feminist memory-making, public arts funding, and Indigenous performance. Recipient of national and international book prizes, research funding, and fellowships, she is currently a Killam Research Fellow.

BRAUND, Susanna – Department of Classical, Near Eastern and Religious Studies, The University of British Columbia

Susanna Braund is the world expert on the translation history of the major Latin poet Virgil. She earlier pioneered literary study of Roman satire and cultural study of the emotions in Roman literature. She produced acclaimed scholarly editions and translations of Juvenal, Persius, Lucan and Seneca. Her synthesizing approach combines philological methods and contemporary theoretical frameworks to illuminate and deepen our appreciation of Latin literature and Roman culture.

BRUNO-JOFRÉ, Rosa – Faculty of Education & Department of History, Queen's University

Rosa Bruno-Jofré is internationally acclaimed for her research into the history of education, the development of large interdisciplinary projects, and her futuristic view of outreach. She has contributed innovative approaches to the study of Catholic history (with an emphasis on the history of female Catholic teaching congregations and social Catholic thinkers), the reception of John Dewey's theories, popular education and Paulo Freire, and extensive analysis of Ivan Illich.

COOK, Tim – Canadian War Museum

Tim Cook is a public historian whose scholarship and exhibitions have explored Canada and the World Wars. His many award-winning books focus on the social and cultural history of Canadians and the contested means by which we remember and make meaning of conflict. His work as an historian at the Canadian War Museum and his media appearances have widely disseminated history to the Canadian public. He is a member of the Order of Canada.

EDMONDSON, Jonathan – Department of History, York University

Jonathan Edmondson is an internationally renowned Roman historian, whose research on Rome's Hispanic provinces has made path-breaking contributions to our understanding of the impact of Roman imperialism on provincial communities. A leading epigrapher, he co-edited the landmark *Oxford Handbook of Roman Epigraphy* and co-directs ADOPIA, a digital atlas of personal names from the Iberian Peninsula in antiquity. His research on gladiators provides new perspectives on the significance of public spectacle in the Roman world.

HILLMER, Norman – Department of History, Carleton University

Norman Hillmer is Chancellor's Professor of History and International Affairs at Carleton University. An authority on Canadian foreign policy, the Commonwealth, and conflict and its avoidance, he has written or edited thirty-one books, published widely abroad, and is the award-winning biographer of O.D. Skelton, the architect of the Canadian foreign service. Dr. Hillmer was appointed to the Order of Canada in 2016 for his contributions to scholarship and public history.

JENNINGS, Eric – Department of History, University of Toronto

Eric Jennings is a leading authority in the fields of modern French colonial history and the study of France and the Francophonie. His many publications in Canada's two official languages have contributed to globalizing and de-centering the history of France. They have spanned and involved archival research on five continents and have garnered a number of book prizes and awards.

KLASSEN, Pamela – Department for the Study of Religion, University of Toronto

Pamela Klassen's innovative approaches to religious diversity in North America have helped catalyze three new fields of research: the ethnographic and gendered turn in religious studies; analyses of secularism as theory and lived practice; and attention to spirituality within Indigenous-settler relations. An award-winning author with books on religion and medicine, missionary colonialism, and public memory, she is a leader in several major interdisciplinary projects committed to building international research communities.

McCANCE, Dawne – Faculty of Arts, University of Manitoba

Dawne McCance is an internationally recognized interdisciplinary scholar and critic. Her innovative and integrative research engages religion, bioethics, feminism, philosophy, psychoanalysis, literary criticism, architecture, animal and disability studies, and the history of academic freedom. As the eighteen-year Editor of *Mosaic: an interdisciplinary critical journal*, she published multiple interviews with leading scholars, organized four major international interdisciplinary conferences, and established *Mosaic* in Europe and North America as a pathbreaking critical forum.

MOORE, Margaret – Department of Political Studies, Queen's University

Margaret Moore is internationally recognized for her ground-breaking work on territory. It has opened up new avenues of research on such diverse areas as rights of return, gentrification, secession, boundary-drawing and resource rights.

SCHLICH, Thomas – Social Studies of Medicine, McGill University

Thomas Schlich is an eminent scholar in the history of modern surgery. His research has examined the rationale for surgery—why surgeons open the body—and the techniques they developed to do so—how they do it. Schlich's work thus elucidates the history of medical innovation in its scientific, intellectual and social context, including organ transplants, metal implants in fracture treatment and minimally invasive surgery.

SIEMERLING, Winfried – Department of English Language & Literature, University of Waterloo

Winfried Siemerling is internationally recognized for his pioneering work on Canadian and other North American literatures and cultures in comparative and transnational perspectives. Critically acclaimed for his incisive theorization of English, French and black Canadian writing, Siemerling has influentially repositioned Canadian cultural achievement within broader North American, hemispheric, and transatlantic contexts, breaking new ground with prize-winning works like *The New North American Studies* (2005) and *The Black Atlantic Reconsidered* (2015).

TY, Eleanor – Department of English & Film Studies, Wilfrid Laurier University

Eleanor Ty is a leading scholar of Asian Canadian Literature. Her research and publications have defined and shaped the field. Ty's *Asianfail: Narratives of Disenchantment and the Model Minority* was awarded the best Adult Non-Fiction Book for 2017 by APALA: Asian/ Pacific American Librarians Association. She was the Fulbright Canada Research Chair at University of California, Santa Barbara for 2018-19, and was named University Research Professor in 2015.

Division des lettres et des sciences humaines

BEAUDRY, Guylaine – Concordia University Library

Guylaine Beaudry is a leader in the transition of libraries to the digital culture. At the helm of a research library, she contributes to redefining university education and research, while being fully engaged in research activities. Co-founder of *Érudit*, the leading scholarly journal publishing platform in Canada, her accomplishments allow hundreds of thousands of researchers and students to benefit from scholarly publications and data.

COMEAU, Gilles – École de musique, Université d'Ottawa

Gilles Comeau, recognized for his ground-breaking work, has helped establish piano pedagogy on solid scientific basis. With the creation of a unique research laboratory and ingenious multidisciplinary research, Comeau has opened a new path in research. Thanks to his contributions, it is now possible to consider the piano pedagogy as a true field of research.

DORION, Louis-André – Département de philosophie, Université de Montréal

Louis-André Dorion is a world-renowned specialist in ancient philosophy. He published extensively on Socrates, Plato, and Aristotle, but he is best known for his translation of Xenophon's *Memorabilia* and for the accompanying commentary, both of which have greatly contributed to the current revival of research on Xenophon's Socratic writings. His book on Socrates, whose first edition dates back to 2004, has been translated into eight languages.

GOSCHA, Christopher – Faculté des sciences humaines, Université du Québec à Montréal

Christopher Goscha's work has helped renew our understanding of the wars for Vietnam during the second half of the Twentieth century, the American commitment to the Cold War in Asia, and the complexities of French decolonization in Asia and North Africa. He has played a leading role in developing global history courses in Canada emphasizing the interconnectedness of our world from antiquity to the present.

Division of Arts

BABINEAU, Marcia – Département d'art dramatique, Université de Moncton

Marcia Babineau has been instrumental in developing and establishing an authentic voice for Acadian theater. Actress and director, she is also a co-founder of *théâtre l'Escaouette*, a company dedicated to the production of new works endowing Acadia with a new dramaturgy. As Director of the Dramatic Arts Department at the Université de Moncton, she has trained an entire new generation of actors who are acclaimed in the many aspects of Acadian theater.

DAIGLE, France

France Daigle is an Acadian novelist born in Dieppe, New Brunswick. Since 1983, her work has drastically changed the horizon of expectation of francophone literature and been recognized with numerous awards, including the Governor General's Literary Award. Among francophone authors, France Daigle has produced a unique body of work that is incredibly rich in style and content.

HUDSON, Anna – Department of Visual Art & Art History, York University

Anna Hudson is an art historian / curator specializing in Canadian art, curatorial and Indigenous studies. As a York Research Chair and Principal Investigator of the SSHRC project, *Mobilizing Inuit Cultural Heritage*, Hudson aims to amplify the practice of cultural values by circumpolar Indigenous artists. Drawing from her doctoral dissertation, *Art and Social Progress: the Toronto community of Painters (1933-1950)*, Hudson continues historical research on humanist aesthetics and cultural activism.

KNOX, Hank – Schulich School of Music, McGill University

Hank Knox is a renowned figure in the historically-informed performance of early keyboard music on original instruments. He has expanded knowledge of the musical past by championing the work of lesser known composers and by co-founding Montreal's Arion Baroque Orchestra. He established one of the first centres of excellence for the study of early music in North America and has achieved prominence in training the new generation of performers.

REA, John – Schulich School of Music, McGill University

John Rea is a preeminent composer whose varied catalogue includes nearly 80 original works and several innovative reorchestrations. Recipient of the three most important prizes for composition in Canada, he has taught at McGill University since 1973. Co-founder of two pioneering music societies in Montreal, he played a key role in shaping the contemporary music scene, and pursued a far-reaching vision for the mentoring of future Canadian musicians.

ACADEMY OF SOCIAL SCIENCES

Division of Social Sciences

BUBELA, Tania – Faculty of Health Sciences, Simon Fraser University

Tania Bubela is an internationally recognized scholar of the ethical, legal, economic, and social implications of novel health biotechnologies. Her interdisciplinary, empirically-grounded research has advanced understanding of global innovation ecosystems; collective action and governance challenges in data and biomaterials sharing; and regulatory and policy reforms for research and development of cost-effective diagnostics and biotherapies that have positive health impacts. Her international knowledge translation activities engage patients, clinicians and health decision-makers.

GALLAGHER, Kathleen – Ontario Institute for Studies in Education, University of Toronto

Kathleen Gallagher's contributions as a public intellectual concern the pressing and growing problem of social inequality shouldered by youth in our society, and how their experiences of marginalization inform their civic engagement. An award-winning scholar in the fields of education and theatre studies, she uses theatre methodologically to mobilize knowledge from mixed-methods research into communities of practice, such as education systems, theatres, homeless shelters, and youth and non-governmental organizations.

CAVANAGH, Patrick – Department of Psychology, Glendon College, York University

Patrick Cavanagh has pioneered new directions in the areas of spatial and temporal resolution of visual attention. He discovered a distorted perception of position caused by movement and has presented a new theory of position perception based in the cortical and subcortical areas of attention and eye movement control. Cavanagh has also opened new research that uses the properties of art to reveal the functioning of the visual brain.

GIFFORD, Robert – Department of Psychology, University of Victoria

Robert Gifford is an internationally renowned psychologist. His influential work helped define the scholarly field of environmental psychology while informing urban design guidelines and public policies aimed at reducing the negative health consequences of environmental stressors and promoting resource conservation and sustainability. Dr. Gifford's seminal publications on 'the dragons of inaction' illuminate barriers to people adopting environmental behaviours and provide important insights and advice to policymakers grappling with climate change.

GRADY, Cheryl – Rotman Research Institute at Baycrest, University of Toronto

Cheryl Grady is internationally known as a pioneer in the study of the brain mechanisms underlying cognitive changes with age. She was first to show that older adults have reduced brain activity in perceptual brain areas, compared to younger adults, but increased activity in frontal cortex. This ground-breaking work has led to multiple lines of research worldwide into compensation in the aging brain and greatly influenced theories of cognitive aging.

JOHNSON, Joy – Faculty of Health Sciences, Simon Fraser University

Joy Johnson is a leading authority on health promotion and health behaviour who has advanced the understanding of sex and gender in health, particularly relating to substance use and mental health. SFU's first female Vice-President, Research and the former director of the CIHR Institute of Gender and Health, she is internationally recognized for her leadership in building Canada's health research capacity and shaping research, policy and practice for better health outcomes.

JOHNSON, Juliet – Department of Political Science, McGill University

Juliet Johnson conducts internationally acclaimed research in two fields: international political economy, and memory and commemoration. Using a range of methods, she has explored the transformation of post-communist financial systems, central bank learning and the rise of financial nationalism after the global financial crisis, and political struggles over the fate of Soviet-era monuments and memorials. She has won numerous international prizes and is Lead Editor of the journal *Review of International Political Economy.*

MAHON, Rianne – Department of Political Science, Wilfrid Laurier University; Department of Sociology and Anthropology, Carleton University

Rianne Mahon is an internationally recognized expert on comparative social policy and gendered global governance whose contributions cover a range of important debates and traverse several disciplines. She has made major contributions to reformulating theories of the state and pioneered research on the OECD along with other international organizations. Through cross-national comparative analysis, she has advanced our understanding of the interaction of local, national and international scales of politics.

MENDES, Errol – Faculty of Law, University of Ottawa

Errol Mendes' leadership, research and scholarship speak directly to issues of critical importance affecting our world and our society. The scope of Professor Mendes' work and publications is truly extraordinary, including global governance, international law, human rights, and Canadian constitutional law. He is the Editor-in-Chief of *The National Journal of Constitutional Law* and is the author or co-editor of 11 books.

MOGIL, Jeffrey – Departments of Psychology and Anesthesia, McGill University

Jeffrey Mogil has made seminal contributions to the field of pain research, founding the significant new subfield of pain genetics. His demonstrations of the effect of strain, sex, social factors, and laboratory variables on pain behaviour in animals have improved the design and interpretation of pain experiments worldwide. His discovery of empathy and facial expressions of pain in laboratory animals also have implications for ethics and veterinary care.

MORRONGIELLO, Barbara – Department of Psychology, University of Guelph

Barbara Morrongiello is an international leader in childhood injury prevention. Her rigorous research on childhood injuries and development of innovative strategies for prevention have led to new ways of thinking in this field. Known for her creativity and originality, her pioneering research has introduced novel study methods and measures, led to critical insights into psychological determinants of parent safety practices and children's risk taking, and yielded numerous novel injury-prevention programs.

NOSSAL, Kim – Department of Political Studies, Queen's University

Kim Richard Nossal has published widely and influentially on Canada's foreign and defence policy. Uniquely, his scholarship has successfully sought to build bridges to the significant scholarly community whose work on Canada's global role is in French. More broadly, his innovative and original scholarship on international sanctions continues to inform the ongoing global debate about this tool of statecraft.

TANAKA, James – Department of Psychology, University of Victoria

Jim Tanaka is an internationally recognized researcher in the vision sciences who investigates how experience shapes the way we perceive objects in the world. His work has opened new doors of research for teaching expert recognition in medicine, biology and autism. He is the founder of the Centre for Autism Research, Technology and Education (CARTE) whose goal is to improve the everyday lives of children with autism and their families.

TOOPE, Stephen J. – Vice-Chancellor, University of Cambridge

Stephen J. Toope publishes in leading journals on human rights, international dispute resolution, the use of force, and legal theory. He has won Canadian and international publishing awards, and lectures at universities around the world. An academic leader in three Canadian provinces, he has also undertaken many public service roles in Canada and for the UN.

WINNE, Philip H. – Faculty of Education, Simon Fraser University

Philip Winne is a pioneering theorist and methodologist contributing to research on self-regulated learning and learning analytics. He launched the cognitive medational paradigm in educational psychology and sparked a methodological shift toward gathering trace data that reveal learning skills and strategies as process events. His team engineers state-of-the-art software to support online learning while simultaneously assembling big data that are fueling advances in 21st century learning science.

ZHAO, Yuezhi – School of Communication, Simon Fraser University

Yuezhi Zhao explicates the dynamics of communication and power relations through transdisciplinary and globally-oriented work. She enriches understanding of Anglo-American media by revealing the politics of journalistic objectivity, and informs contemporary debates on China's transformation with pathbreaking examination of the communicative dimension. Her holistic global-to-village transcultural political economy scholarship transcends the East/West dichotomy and integrates theoretical and applied approaches, while contributing to international collaboration, pedagogical innovation, network-building, and grassroots empowerment.

Division des sciences sociales

CYR, Mireille – Département de psychologie, Université de Montréal

Mireille Cyr is recognized worldwide for her work on child sexual abuse. Carried out in close collaboration with several intervention communities, her research has contributed to further our understanding of the impact of sexual abuse disclosure on mothers and fathers, as well as their abilities to support their children. She is also a leader in the investigative interviewing for children through her work on the *National Institute of Child Health and Human Development* protocol and its related training.

GENDRON, Corinne – Département de stratégie, responsabilité sociale et environnementale, Université du Québec à Montréal

Corinne Gendron conducts research on social responsibility and sustainable development using an original conceptualization of the relationships between the environment, the economy and social dynamics. Her work on the economic and political elite, the structure of big firms and new social and economic movements helps reveal the trajectories of ecological modernization. She is also interested in the relationship between science and society and the dynamics of social acceptability. Chevalier of the Légion d'honneur of France, she has been awarded several prizes and distinctions throughout her career.

GRIMARD, Céleste – Département d'organisation et ressources humaines, Université du Québec à Montréal

Céleste Grimard is a prolific, internationally-recognized scholar whose research has had a significant impact on research that addresses critical workplace issues. Her highly cited, award-winning, creative research on bullying, emotions, and burnout in the workplace have served as the cornerstone of the contemporary discussion of how to cultivate healthy work lives. Currently, Dr. Grimard is passionate about translating research into informed, day-to-day workplace practice, whether through innovative teaching or direct interventions with managers.

PROVOST, René – Faculté de droit, Université McGill

René Provost's pioneering work on the legal regulation of armed conflicts has challenged accepted thinking on the most effective strategy to protect the victims of war. Embracing a theoretical perspective rooted in legal pluralism and a methodology inspired by legal anthropology, he has explored how legal and cultural norms interact to identify new avenues to induce compliance with international humanitarian law by armed state and non-state actors.

YAYA, Sanni – École de développement international et mondialisation, Université d'Ottawa

Sanni Yaya is a leading scholar in the fields of economics and global health. He is a prolific academic driven by a humanistic vision and a passion for multidisciplinary research. Dr. Yaya's outstanding contributions, which are theoretical, empirical and critical, have been recognized nationally and internationally and have helped to put health back on the agenda of the social sciences and to the center of debates on international development.

ACADEMY OF SCIENCE

Division of Applied Sciences and Engineering

BOUTABA, Raouf – Cheriton School of Computer Science, University of Waterloo

Raouf Boutaba, University Chair Professor of Computer Science at the University of Waterloo, is an internationally acclaimed authority and leading researcher in the management of communication networks. He is particularly known for his pioneering contributions to automated management, which directly led to the trend towards autonomic networking, and for his groundbreaking work on network virtualization and network softwarization expected to revolutionize the way communication networks are designed, operated and managed.

CHEN, Zhongwei – Department of Chemical Engineering, University of Waterloo

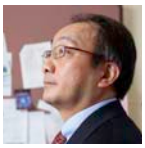
Zhongwei Chen is an outstanding researcher and global leader in advanced materials for next-generation battery and fuel cell technologies. His work has received over 20,000 citations and has led to the establishment of deep collaborative partnerships and several technology companies in Canada and around the world. Dr. Chen is a Fellow of the Canadian Academy of Engineering and a 2016 recipient of the NSERC Steacie Memorial Fellowship.

KESHAV, Srinivasan – Cheriton School of Computer Science, University of Waterloo

Srinivasan Keshav has an outstanding international reputation for his ground-breaking work in two distinct fields: computer networking and energy systems. He has made innovative contributions to network congestion control and simulation; wireless networking; and the application of computer networking principles to energy systems in the emerging area of Energy Informatics. Dr. Keshav is a Fellow of both the Association for Computing Machinery and the Institute of Electrical and Electronics Engineers.

KHADEMHOSSEINI, Alireza – Departments of Radiology, Chemical and Biomolecular Engineering, and Bioengineering, University of California, Los Angeles

For global leadership in tissue engineering and biomaterials research. Particularly for pioneering contributions to the development and understanding of micro- and nanoengineered hydrogels for making artificial tissues, surgical materials, and disease models. His contributions have formed the foundations of fields such as organs-on-a-chip systems and three-dimensional bioprinting. In addition, his engineered materials are transformational as surgical sealants and embolic agents.



LU, Zheng-Hong – Department of Materials Science and Engineering, University of Toronto

Zheng-Hong Lu is a world renowned scientist in the field of organic optoelectronic materials and devices. His fundamental research works on surfaces, interfaces, and thin-films lay the foundation for engineering of simpler and more energy-efficient organic light-emitting diodes. Professor Lu is the Tier I Canada Research Chair in Organic Optoelectronics, a fellow of AAAS, and a fellow of the Canadian Academy of Engineering.

PEI, Jian – School of Computing Science, Simon Fraser University

Jian Pei has made seminal contributions to the foundation of data mining, data analytics and applications. In particular, he invented the state-of-the-art pattern mining principles and a series of methods, which have been highly cited, extensively used by industry, and adopted by data mining textbooks and open source software toolkits.

SUN, Yu – Department of Mechanical and Industrial Engineering, University of Toronto

Yu Sun is an international leader in the field of micro/nano robotics. He spearheaded robotic cell manipulation and has made breakthroughs in clinical cell surgery and manipulation/measurement of cells, intracellular structures, and tissues for disease therapeutics, diagnostics, and drug screen. He has also contributed significantly to advances in cellular mechanobiology and the mechanics of nanomaterials via the development of enabling micro-nano instrumentation technologies.

XU, Dan-Xia – Advanced Electronics and Photonics Research Centre, National Research Council Canada

Dan-Xia Xu has been a pioneer and global leader in silicon photonics for more than two decades, making discoveries that launched this field and subsequently drove advances in components for optical communications, sensing, spectroscopy and metrology. Of particular significance are her inventions in polarization management techniques and biomolecular sensing. She recently broke new ground with machine learning methods that dramatically simplify high-dimensional photonic design challenges.

Division of Earth, Ocean and Atmospheric Sciences

CREED, Irena – School of Environment and Sustainability, University of Saskatchewan

Irena Creed is an internationally recognized scientist whose *un*disciplinary training brings a fresh perspective to the field of ecosystem sciences. She is dedicated to developing scientific and practical tools needed to solve major policy challenges of the modern world. For climate warming, hydrologic intensification, and atmospheric pollution, she leads the forces of discovery through impactful scientific leadership. With her unbounded energy and passion, she uses her creative science to empower communities-at-risk.

LETCHER, Robert – Departments of Chemistry and Biology, Carleton University

Robert Letcher is a scientist with Environment and Climate Change Canada and Adjunct Professor, Departments of Biology and Chemistry, Carleton University. As reported in >350 peer-reviewed journal papers and other publications, his research has advanced the understanding of the environmental persistence, exposure, bioaccumulation, metabolism and effects of chemical contaminants in biota and their ecosystems throughout Canada and internationally. His innovative research has highly influenced risk assessment and management of chemicals in Canada and worldwide.

MacDONALD, Glen – Department of Geography, University of California, Los Angeles

Glen Sproul dit MacDonald is an international leader in developing long records of climatic change to address questions of forcing factors, teleconnections, and the impacts of climate change on ecosystems, evolutionary and extinction dynamics, and societal vulnerability. His studies, ranging from Arctic warming, the hydroclimatology of western North America, and sea level rise and the fate of coastal marshes, have included work in North America, Europe, Asia and Africa.

STRONG, Kimberly – Department of Physics, University of Toronto

Kimberly Strong is an internationally eminent atmospheric physicist who employs an array of spectroscopic techniques to probe the composition of the atmosphere. She has developed novel experimental methodologies and analysis tools, and established long-term observing capabilities in the Canadian Arctic and elsewhere. Her research has provided new insights into the physical and chemical processes that drive atmospheric change, furthering our understanding of ozone depletion, air quality, and climate.

SUMAILA, Rashid – Institute for the Oceans and Fisheries, The University of British Columbia

Rashid Sumaila is one of the world's most innovative researchers on the future of the oceans, integrating the social, economic and fisheries sciences to build novel pathways towards sustainable fisheries. His work has challenged today's approaches to marine governance, generating exciting new ways of thinking about our relationship to the marine biosphere, such as protecting the high seas as a "fish bank" for the world and using "intergeneration discount rates" for natural resource projects.

Division of Life Sciences

BOYCOTT, Kym – Brain and Mind Research Institute, University of Ottawa / Children's Hospital of Eastern Ontario (CHEO)

Kym Boycott, a Professor of Pediatrics at uOttawa, Clinical Geneticist at CHEO, and Senior Scientist at CHEO Research is a visionary in employing genomics to understand molecular mechanisms of rare disease. She leads Care4Rare Canada, an internationally renowned platform that has identified the genetic cause of 460 rare diseases while discovering 125 new genes. She also leads international initiatives to advance global cooperation and data sharing in rare disease.

CHAMBERS, Ann – Departments of Oncology, Medical Biophysics, and Pathology, Western University

Ann Chambers is one of Canada's most internationally renowned experts on tumor progression and metastasis, the cause of most cancer deaths. Among her many exceptional achievements in basic and translational cancer research aimed at benefitting patients are the development of novel ways to image metastasis, identification of dormant cancer cells that resist treatment and later form metastases, and development of approaches for studying biomarkers of cancer progression in patients.

FRIEDENREICH, Christine – Arnie Charbonneau Cancer Institute, University of Calgary

Christine Friedenreich is an internationally-recognized cancer epidemiologist whose pioneering work has demonstrated that physical activity reduces cancer risk and improves rehabilitation and survival after diagnosis. She investigated the etiology and biology of these associations in both observational and experimental studies using innovative methods for physical activity assessment. Her research is being used to develop national and international physical activity guidelines for cancer control aimed at decreasing cancer burden worldwide.

FRYXELL, John – Department of Integrative Biology, University of Guelph

John Fryxell is an internationally recognized ecologist whose work has shaped the way we study and protect wildlife. His innovative research combining theoretical and empirical approaches has led to novel insights on animal movement and population dynamics in ecosystems ranging from the Serengeti and the boreal forest to fisheries. Collectively, his work represents a truly outstanding contribution to our understanding of animal ecology in an era of unprecedented global change.

GAN, Yantai – Agriculture and Agri-Food Canada

Yantai Gan is an internationally renowned scientist in agroecosystems. He invented pulse-based, "integrated suite" of farming technologies. Adoption of the novel "suite" has fundamentally shifted Western Canadian agriculture into a more sustainable and resilient system, with significant eco-environmental and socioeconomic impacts. Carbon footprint models he developed have been adopted by policy-makers and scientific communities worldwide to quantify carbon sequestration to soils in various farming systems.

GRIMSHAW, Jeremy – Ottawa Hospital Research Institute, University of Ottawa

Jeremy Grimshaw is one of the world's foremost healthcare implementation researchers. He has produced an innovative, interdisciplinary body of research developing the scientific basis of how to promote the uptake of evidence in healthcare to improve patient outcomes and ensure healthcare system sustainability. His research contributions have informed policy and practice in Canada and globally.

HUNTSMAN, David – Faculty of Medicine, The University of British Columbia

David Huntsman has used pathology and genetic tools to redefine our understanding of ovarian and several rare cancers including hereditary stomach cancer. He proposed, developed, and promulgated the current subtype-specific and biologically informed approach to ovarian cancer research, prevention, and treatment. He has been a leader and mentor within the Canadian cancer research community. His research is highly cited and most importantly has saved lives.

KENNEDY, Sidney – St. Michael's Hospital, University of Toronto

Sidney Kennedy is an internationally renowned researcher in depression. He has founded large scale networks that successfully translate scientific findings to clinical practice, promote knowledge translation, and train next-generation scientists. He and his collaborators pioneered deep brain stimulation for treatment resistant depression. By integrating molecular, brain imaging, and clinical data, he has advanced the field of precision psychiatry and continues to promote the development of targeted therapeutic interventions.

MacDERMID, Joy – School of Physical Therapy, Western University

Joy MacDermid pioneered patient-reported outcome measures that are widely used to assess functional outcomes. As a leader in evidence-based surgery and rehabilitation, she has developed and applied methods to synthesize research. She works with knowledge users to identify priority issues in musculoskeletal health and leads the resulting (inter)national clinical trials. These trials and syntheses have had a major impact on practice and policy in Canada and internationally.

MENON, Ravi – Robarts Research Institute and Department of Medical Biophysics, Western University

Ravi Menon's contributions to the landmark demonstration and development of functional MRI are cited in nominations for the most prestigious international prizes in science and medicine. A leader in the development, use and commercialization of ultra-high field MRI scanners for radiology and neuroscience, his pioneering research impacts thousands of scientists, clinicians and patients every day.

MESSIER, Christian – Département des sciences biologiques, Université du Québec à Montréal et Département des sciences naturelles, Université du Québec en Outaouais

A forest engineer and a specialist in forest ecology and the development of natural and urban forests, Christian Messier studies how trees and their ecosystems work in order to develop approaches that are increasingly resilient in the face of overall change. His work has made it possible to improve the management of forests in natural and urban environments and begin changing the paradigm around developing our forests based on complex adaptive systems.

POLLAK, Michael – Faculty of Medicine, McGill University

Michael Pollak is a clinician-scientist who has made seminal contributions to the field of cancer endocrinology, with worldwide impact. Working in a highly collaborative and multidisciplinary fashion, he has documented previously unrecognized hormonal influences on carcinogenesis and cancer behaviour that have important implications for prevention and treatment of the disease.

ROWE, Locke – Department of Ecology & Evolutionary Biology, University of Toronto

Locke Rowe is an internationally leading evolutionary biologist. He is recognized for his ground breaking studies on the ecology and evolution of animal life cycles, and the evolutionary divergence of the sexes. Prof. Rowe's influence results from original insights, critical tests of theory, and new syntheses.

SCHULTE, Patricia M. – Department of Zoology, The University of British Columbia

Patricia Schulte is a world-leading authority in evolutionary physiology. She is internationally recognized for her work linking genomics, epigenomics, biochemistry and physiology to assess the performance of fishes in a changing environment. Her pioneering work on the molecular mechanisms that underlie inter-individual variation in resilience to environmental change has had significant implications for both the conservation of natural fish populations and aquaculture in a changing world.

SORENSEN, Poul – Department of Pathology & Laboratory Medicine, The University of British Columbia

Poul Sorensen is an internationally renowned clinician-scientist whose pioneering work uncovered numerous genetic and biological drivers of aggressive childhood cancers, many of which were subsequently directly linked to the biology of adult malignancies. He was the first to show that *NTRK* gene fusions are recurrent oncogenic drivers, which are now estimated to occur in 1% of human cancers, leading to the development of recently approved drugs to target these lesions.

TAMBLYN, Robyn – Department of Medicine and Department of Epidemiology, Biostatistics and Occupational Health, McGill University

Robyn Tamblyn is internationally recognized for her sentinel contributions to the establishment and validation of new methods of assessing clinical competence using standardized patients, and award-winning interventions to improve the safety and effectiveness of prescription drug management. Her research was the foundation for the world's first national physician qualifying examination that tested clinical and communication skills, led to changes in medication policy, the Order of Canada and leadership at CIHR.

TAYLOR, Michael – The Hospital for Sick Children Research Institute, University of Toronto

Michael Taylor is a recognized world-leader in brain tumour research. His research efforts centred on the molecular genetics of two malignant paediatric brain tumours—medulloblastoma and ependymoma, have improved the level of collaboration, and raised the quality and increased the pace of brain tumour research around the globe. His work continues to sustain Canada at the forefront of cancer innovation while significantly impacting the treatment for children around the world.

WHITLOCK, Michael – Department of Zoology, The University of British Columbia

Michael Whitlock is distinguished for his contributions to theoretical and empirical population genetics. He is responsible for many of the foundational population-genetic results about how evolution works in a spatial context, and he has made significant contributions to the methodology of measuring evolutionary processes. Whitlock has written a leading text on statistical methods and played a key role in establishing data archiving for the major publications in his field.

Division of Mathematical and Physical Sciences

BOYD, Robert – Department of Physics, University of Ottawa

Robert Boyd is an internationally acclaimed expert in nonlinear optics and photonics. He has made significant contributions to the development of methods for controlling the velocity of light, of quantum imaging methods, and for the theoretical description and laboratory characterization of materials and metamaterials that display giant optical nonlinearity. He is also noted for pedagogical work aimed at conveying the conceptual understanding of the nature of nonlinear optical interactions.

GINGRAS, Michel – Department of Physics and Astronomy, University of Waterloo

Michel Gingras has made internationally acclaimed contributions to the field of condensed matter physics, in particular in the area of magnetic materials subject to strongly competing, or frustrated, interactions as well as condensed matter systems subject to frozen random disorder. Using analytical and numerical methods, he has explained a number of long-standing experimental paradoxes, provided an impetus for new experimental studies and motivated the synthesis of new magnetic compounds.

BOYLE, Phelim – Lazaridis School of Business and Economics, Wilfrid Laurier University

Phelim Boyle is an actuary whose seminal research work in finance and insurance has won international recognition. He uses mathematical methods to solve problems at the interface of these fields. Boyle has made pioneering contributions to quantitative finance and his ideas have transformed how actuaries handle financial risk. His research has influenced financial practice by providing sophisticated tools for financial institutions to better manage their risks.

KRAATZ, Heinz-Bernhard – Department of Physical and Environmental Sciences, University of Toronto Scarborough

Bernie Kraatz has an international reputation for innovative research, bringing together biological chemistry and electrochemistry and contributing significantly to our understanding of the interactions of biological molecules on surfaces. He creatively uses bioconjugates to monitor pathogens, biomolecules, and biochemical transformations. This allows him and his team to build sensors with potential applications in medicine, food safety, and the environment.

ESTER, Martin – School of Computing Science, Simon Fraser University

Martin Ester is one of the world's foremost experts in data mining, particularly clustering, an essential tool for knowledge discovery in databases. A pioneer in density-based clustering, his now-classic DBSCAN algorithm has inspired productive research directions in many fields. He has also made fundamental contributions to recommender systems and social network analysis. His research holds many useful applications for society and industry, including precision medicine, personalized recommendations, and computer security.

LI, Liang – Department of Chemistry, University of Alberta

Liang Li is a Canada Research Chair in Analytical Chemistry. He is best known for developing ground-breaking techniques for advancing proteomics and metabolomics research using mass spectrometry. He is a pioneer in creating metabolomics tool for comprehensive analysis of small molecules with transformational impact in disease biomarker discovery and biology studies. His innovative analytical tools, embodied in commercial products, advance the life sciences.

RUTH, Thomas J. – TRIUMF

Thomas J. Ruth is a world leader in the production of radioisotopes for research and application as is evidenced by his numerous publications, collaborations and consultations. With seminal discoveries that have defined radioisotope production globally, and his visionary pursuit of a range of applications that span health, environmental and resource sectors, Dr. Ruth has established a legacy of international renown.

STRICKLAND, Donna – Department of Physics and Astronomy, University of Waterloo

Donna Strickland is a recipient of the Nobel Prize in Physics 2018 for co-inventing chirped pulse amplification (CPA), the method for creating high-intensity, ultrashort optical pulses. CPA revolutionized the field of high-intensity laser physics, leading to the most intense lasers ever. The work provided new information on the way light interacts with matter. It has applications from medicine to manufacturing.

WEI, Juncheng – Department of Mathematics, The University of British Columbia

Juncheng Wei, Canada Research Chair in nonlinear PDEs, has made many groundbreaking work in the broad area of pure and applied mathematics. He was invited to International Congress of Mathematicians for his surprising counter-example to De Giorgi Conjecture, which represents an extensive and fundamental contribution to the field of nonlinear PDEs. His interdisciplinary research uncovers the hidden mathematical mechanisms in pattern formations in complex physical and biological systems.

YE, Zuo-Guang – Department of Chemistry & 4D LABS, Simon Fraser University

Zuo-Guang Ye is a world-leading authority in solid state materials science, particularly relaxor-based piezoelectric and ferroelectric materials. His instrumental work on the growth, characterization and standardization of these materials has contributed to their successful commercialization in the areas of health care, environment and information technology, and has led to fundamental insights into their complex structure-property relations. Ye is a Fellow of IEEE and plays an active role in research leadership.

INTERNATIONAL FELLOWS

BAI, Chunli – Chinese Academy of Sciences

Chunli Bai is an internationally renowned chemist and a pioneer in nanoscience and nanotechnology development in China. He is President of the Chinese Academy of Sciences, Founding President of University of Chinese Academy of Sciences and Founding Director of the National Center for Nanoscience and Technology. Prof. Bai is an elected Fellow or Foreign Member of over twenty well-known academies including the Royal Society, US National Academy of Sciences.

BRADLEY, Raymond – University of Massachusetts

Raymond Bradley is internationally recognized for his research on paleoclimatology, which has made major contributions to our understanding of the nature and causes of climate change. He has focused in particular on climate variations in the Arctic and North Atlantic region, spending many years doing fieldwork in the Canadian Arctic, Greenland and northern Scandinavia carrying out studies of paleoenvironmental conditions, using lake sediments as archives of the past.

DIECKHOFF, Alain – Sciences Po, Paris

Alain Dieckhoff is an internationally renowned researcher in the study of nationalism and national identities. First focused on the nation-building process of contemporary Israel, his research has led to a large comparative study of 'dissociative nationalisms', in constant dialogue with Canadian experts of nationalism. Strongly interdisciplinary, his work has greatly contributed to renew the understanding of nationalism.

KLOOSS, Wolfgang – Centre for Canadian Studies at Trier University

Wolfgang Klooss is a well known and highly respected figure in Canadian Studies in Germany and one of the leading European scholars studying Canada and Canadian literatures. In twenty books, authored and edited, and over sixty articles, among them seminal studies on literary representations of the Métis, he has developed a far-reaching analysis of Canada, emphasizing its multicultural diversity through creative interdisciplinary work.

SPECIALLY ELECTED FELLOWS

BOUDREAULT, Richard – Polar Knowledge Canada

Richard Boudreault is Chairman of the Board of Polar Knowledge Canada, the federal agency that built and operates the Canadian High Arctic Research Station in Cambridge Bay, Nunavut. He has a 40-year career in applied physics and engineering, and multiple award-winning accomplishments in the fields of aerospace, advanced materials, medical imaging, energy and electronics. He founded or co-founded several academic programs in Europe and Canada.

HALLIWELL, Janet – J.E. Halliwell Associates Inc.

In over 40 years working with the academic research community, Janet Halliwell has made seminal contributions to the evolution of funding programs, research management and S&T policy in Canada. She has played a leadership role in the design and implementation of innovative new programming in her work with each of the federal funding agencies and has championed inter-agency collaboration. She serves on numerous national, regional and institutional boards and committees dealing with the academic research ecosystem.

NILSON, Ralph – President Emeritus, Vancouver Island University

Ralph Nilson, as President and Vice-Chancellor, led the transformation of Vancouver Island University from a regional college to an internationally respected university. Through several initiatives, including launching British Columbia's first tuition waiver program for former youth in care, Nilson worked to combat child poverty through increased access to education, building capacity in Indigenous communities, forming innovative partnerships to better serve the needs of learners and raising the profile of regional universities across Canada.

HONORARY FELLOW

PAYETTE, Julie

Her Excellency the Right Honourable Julie Payette is known for her career as an astronaut, engineer, scientific broadcaster and corporate director. She flew two missions in space, covering 16.5 million kilometres over 611 hours and 401 orbits of the Earth. Ms. Payette was chief astronaut for the Canadian Space Agency and also served many years as CAPCOM (Capsule Communicator) at NASA's Mission Control Center in Houston. Throughout her career, she has served on several boards and has been active in the development of public policies for science and technology. From 2011 to 2017, she held various positions including scholar at the Woodrow Wilson Center in Washington, D.C., scientific authority for Quebec in the United States, director of the Montréal Science Centre and co-producer of scientific outreach programs on Radio-Canada. She holds engineering degrees from McGill University and the University of Toronto and she is the recipient of numerous honours. Ms. Payette is a Companion of the Order of Canada, Knight of l'Ordre National du Québec and she holds more than 27 honorary doctorates. Julie Payette was installed as Canada's 29th governor general in October 2017.

CLASS OF 2019

COLLEGE OF NEW SCHOLARS

ANDREOTTI, Vanessa – Department of Educational Studies, The University of British Columbia

Vanessa Andreotti holds a CRC in Race, Inequalities and Global Change. She is internationally recognized for her critical scholarship and leading-edge pedagogical and artistic experimentations in the fields of global citizenship and international development education. Her research problematizes and offers alternatives to mainstream educational approaches that promote simplistic understandings of global problems and solutions, paternalistic engagements between dominant and marginalized groups, and ethnocentric views of justice, sustainability and change.

BASU, Nandita – Department of Civil and Environmental Engineering, University of Waterloo

Nandita Basu, University Research Chair, is internationally recognized for seminal contributions to ecohydrology and water sustainability in human-impacted environments. Her ground-breaking work on the long-term effects of fertilizer and intensive livestock production on water quality has led to new understanding of the role nutrient legacies play in preventing achievement of water quality goals, and has helped to identify management approaches to improve water quality in lakes and coastal zones.

BEAUCHAMP, Miriam – Département de Psychologie, Université de Montréal

Miriam Beauchamp is a neuropsychologist nominated for her cutting-edge work to prevent and treat pediatric traumatic brain injuries. Her endeavours are relevant to scientists, clinicians, decision-makers, teachers, and parents working to improve the quality of life of children who experience neural, cognitive and social disruptions, and are critical for the optimal development of the youngest members of our society.

BENOIT-OTIS, Marie-Hélène – Faculté de musique, Université de Montréal

Marie-Hélène Benoit-Otis is an internationally renowned musicologist and Germanist. She analyses the connections between music and politics through several case studies, most notably music in concentration camps and music propaganda in the Third Reich. Her publications interrogate the political role of music and musicians, particularly—but not exclusively—in the dynamics of oppression and resistance that characterizes authoritarian regimes.

BIERNASKIE, Jeff – Department of Comparative Biology and Experimental Medicine, University of Calgary

Jeff Biernaskie has made seminal discoveries in somatic stem cell biology and tissue regeneration, particularly in relation to the skin and nervous system. His work identified a dermal stem cell in adult skin and elucidated molecular mechanisms that regulate their behaviour, with potential for future clinical use to improve wound healing. His work clarified the identity of neural stem cells in adult brain and glial cell function following nervous system injury.

BROWN, Blake – Department of History, Saint Mary's University

Blake Brown is one of Canada's leading legal historians whose research tackles vital questions in the history of law and public policy. Author or co-author of three books, including *A Trying Question: The Jury in Nineteenth-Century Canada* and the award-winning *Arming and Disarming: A History of Gun Control in Canada*, he is a publicly engaged commentator on policy issues, promoting a nuanced understanding of the interaction between law and society.

CARLETON, Nicholas – Department of Psychology, University of Regina

Nicholas Carleton led the foundation of the Canadian Institute for Public Safety Research and Treatment, and serves as Scientific Director. His work has impacted mental health outcomes, practices, and policies on the Canadian health system and internationally through developing and integrating a comprehensive system of mental health research, assessment, and treatment. His efforts have galvanized Public Safety Personnel research, setting the stage to tangibly improve mental health for all Canadians.

CERRUTI, Marta – Department of Mining and Materials Engineering, McGill University

Marta Cerruti is a Canada Research Chair in Biosynthetic Interfaces. Working at the intersection between chemistry, biology and medicine, she develops materials that control mineral formation in the body and how drugs are delivered. Her research may help millions of people needing bone grafts and suffering from cardiovascular diseases. More broadly, Marta is committed to working on improving the health of our world's communities.

CHAKRABORTY, Chandrima – Department of English and Cultural Studies, McMaster University

Chandrima Chakraborty has emerged as one of Canada's leading scholars of the literature of India and its diaspora, recognized for her path-breaking contributions to the fields of postcolonial, gender and trauma studies. She has generated positive and meaningful impacts within Canada and internationally through her commitment to exchanging knowledge with broader communities, most recently drawing public attention to the socio-political contexts surrounding the 1985 Air India tragedy and its aftermath.

CHROSTOWSKI, Lukas – Department of Electrical and Computer Engineering, The University of British Columbia

Lukas Chrostowski, a Principal Investigator of the Stewart Blusson Quantum Matter Institute (UBC), is recognized for his leadership in research and education in the design of silicon photonic devices and systems for applications in optical communications and biosensors. His present work is focused on developing new photonics-based information processing circuits: neuromorphic processors, quantum communication, and quantum computers.

CLEVES, Rachel Hope – Department of History, University of Victoria

Rachel Hope Cleves, an internationally recognized cultural historian, focuses on histories of gender, childhood, emotion, food, sexuality, and violence in 18th to 20th century America and Europe. Through significant archival discoveries, she has published to wide acclaim in Canada, the United States and Europe—including two multiple award-winning books. She is committed to public outreach, contributing opinion pieces to popular and academic media and appearing on podcasts and before audiences globally.

COON, Jessica – Department of Linguistics, McGill University

Jessica Coon leads an innovative research program that pairs theoretical research in syntax and morphology with community outreach and language revitalization programs in Indigenous language communities. Her research focuses primarily on Mayan languages currently spoken in southern Mexico and Guatemala, as well as Mi'gmaq, an Algonquian language indigenous to eastern Canada. Her work aims to understand the unique human capacity for language, and how this capacity connects to broader processes of human cognition.

CRAIG, Elaine – Schulich School of Law, Dalhousie University

Elaine Craig studies the relationship between legal norms, concepts of sexual integrity and the development of legal interpretations, approaches and practices that will foster law's capacity to promote justice and better protect the vulnerable. Her scholarship confronts some of the most difficult conceptual issues that arise with respect to the legal regulation of people's identities, relationships, behaviour and intimate lives. Her work grapples with the tensions between safeguarding liberty, protecting sexual integrity and promoting equality and diversity.

DARIMONT, Chris – Department of Geography, University of Victoria

Chris Darimont is the Raincoast Chair of Applied Conservation Science. Taking an interdisciplinary approach he confronts problems and opportunities in wildlife and fisheries management, producing scholarly and real-world impact. Globally, his work on the unique ecology of "human predators"—hunters and fishers—offers novel insight into sustainable exploitation. Regionally, Darimont's group conducts long-term community-engaged research on wildlife and fisheries with Indigenous governments of coastal British Columbia.

DAVISON, Karen – Health Science Program, Kwantlen Polytechnic University

Karen Davison is the first registered dietitian to be awarded a Fulbright Canada Research Chair. Her research, which focuses on nutrition, mental health, and innovative health solutions, has been reported in more than 100 scientific journal articles and professional publications. She has received several national and provincial research awards as well as a Dietitians of Canada Peer Recognition Award. She is currently working on digital reality applications in nutrition education.

DE CARVALHO, Daniel D. – Department of Medical Biophysics, University of Toronto / Princess Margaret Cancer Centre

Daniel De Carvalho is an internationally recognized leader in epigenetics—the study of how genes are turned on and off—and his work is improving how cancer patients are diagnosed, monitored and treated. His laboratory discovered how to induce anti-viral responses against cancer cells and translated this discovery into immunotherapy clinical trials worldwide. He developed new methods for epigenetic profiling, enabling minimally invasive, blood-based, cancer classification and early detection.

DEER, Frank – Department of Curriculum, Teaching and Learning, University of Manitoba

Frank Deer is Kanienkeha'ka from the Mohawk community of Kahnawake, and holds a Tier 2 Canada Research Chair in Indigenous Education. Dr. Deer's programme of research focuses on Indigenous education. His work is intended to investigate and promote the ways in which primary and secondary education supports an important dimension of the journey of Indigenous peoples toward the affirmation of their respective identities: Indigenous languages.

DROLET, Julie – Faculty of Social Work, University of Calgary

Julie Drolet, an expert in international social work, conducts research on social work in disasters, social work field education, and immigrant settlement and integration, and has transformed international social work, and research and field education, to better prepare social workers to address global challenges and realities. As an academic-practitioner-researcher, Professor Drolet employs anti-oppressive and critical perspectives in coaching students on their role as change agents, assessing clients' concerns ethically and systematically, and engaging with international and local community members.

EVANS, David C. – Royal Ontario Museum & Department of Ecology and Evolutionary Biology, University of Toronto

David Evans is internationally recognized for his work on the dinosaur fossil record of Canada. Focusing on diversity and ecosystems, he strives to better understand the causes and consequences of mass extinctions. He has discovered and named over 10 new species of dinosaurs, has curated wildly popular exhibitions, and has been featured in numerous documentaries that have established him as a superlative science communicator.

FLYNN, Lauren – Departments of Chemical & Biochemical Engineering and Anatomy & Cell Biology, Western University

Lauren Flynn is internationally recognized for her pioneering research in transforming human fat discarded as surgical waste into pro-regenerative therapies with the potential to revolutionize the treatment of soft tissue defects in plastic and reconstructive surgery. With unique expertise in bioscaffold fabrication and adipose-derived stem cells, she is also developing innovative strategies to address areas of significant clinical need in wound healing and the treatment of peripheral vascular disease.

FORSYTH, Janice – Department of Sociology, Department of Indigenous Studies, Western University

Janice Forsyth is transforming the way Canadians understand the role of sport in Indigenous lives. Her research focuses on the way sports have been used as tools for colonization, and how Indigenous people have used those same activities for cultural regeneration and survival. The insights generated from her work have shaped federal policies on sport and health, while generating critical acclaim and attention from scholars, practitioners, and major media.

GRANT, Shauntay – Department of English, Creative Writing Program, Dalhousie University

Shauntay Grant is a gifted multidisciplinary artist whose excellence has attracted national and international recognition. A passionate advocate for the rich culture of Nova Scotia's historic Black communities, she creates artworks that are engaging and accessible, but also challenging, rigorous, and informed by deep research. Accomplished in literary, performing, and visual arts, she is bringing the African Nova Scotian experience to the forefront of Canada's collective imagination.

HERDER, Matthew – Faculties of Medicine & Law, Dalhousie University

Matthew Herder has made extensive contributions to the field of pharmaceutical policy. In particular, his scholarly research has shown that information about pharmaceutical drugs is often kept secret as a matter of practice rather than the law. Through his research, Herder has recovered powerful examples of transparency in Canadian drug regulation and called upon health professionals, researchers, and others to push for fundamental changes in the regulatory system.

JIM, Alice Ming Wai – Department of Art History, Concordia University

Alice Ming Wai Jim is Full Professor of Contemporary Art History and Concordia University Research Chair in Ethnocultural Art Histories. She is co-editor-in-chief of the international journal *Asian Diasporic Visual Cultures and the Americas*. An art historian and curator, her research on diasporic art in Canada and contemporary Asian art has generated new dialogues within and between ethnocultural and global art histories, critical race theory, media arts, and curatorial studies.

JULIEN, Jean-Philippe – Program in Molecular Medicine, Hospital for Sick Children / University of Toronto

Jean-Philippe Julien uses structural and biophysical techniques to characterize how antibodies are made by the immune system, and how they recognize antigens. This information improves our understanding of immunity and guides development of new vaccine candidates for malaria and HIV. His discoveries also lead development of antibody therapeutics to deplete the dysregulated cells associated with autoimmune diseases and cancers.

KATTAN, Lina – Department of Civil Engineering, University of Calgary

Lina Kattan is an Urban Alliance Chair in Transportation Systems Optimization at the University of Calgary. She is a leading expert on the impact of emerging vehicular technologies on transportation systems. Using advanced mathematical modelling and simulation analysis, Dr. Kattan has developed novel ways to improve the efficiency, equity and safety of traffic and transit operations.

LACELLE, Denis – Département de géographie, Université d'Ottawa

Denis Lacelle, with broad research interests in the permafrost environments of Arctic and Antarctica, is making groundbreaking contributions to the scientific knowledge of: i) the origin, age, constituents, and future of Arctic and Antarctic ground ice; ii) the history and dynamics of permafrost terrain, iii) the effects of changing climate on our fragile terrestrial Arctic ecosystems and iv) the dynamics of ground ice on Mars.

LETTRE, Guillaume – Département de médecine, Université de Montréal

Guillaume Lettre, Canada Research Chair, is an international leader in the fields of human complex trait genetics and functional genomics at the Université de Montréal. He has discovered hundreds of genes that influence the risk of cardiovascular and hematological diseases. These discoveries have led to the development of new predictive genetic tests and the identification of new therapeutic targets, such as the BCL11A gene to treat sickle cell disease.

LIU, Juewen – Department of Chemistry, University of Waterloo

Juewen Liu, University Research Chair at the University of Waterloo, has gained a national and international reputation for his contributions in enzyme mimics, bioanalytical chemistry, and biointerface chemistry. His team discovered many new DNA sequences for detecting heavy metals and water quality monitoring. He has authored many highly cited papers and his leadership in the analytical and nanotechnology communities has been recognized by many awards.

LIU, Yang – Department of Civil and Environmental Engineering, University of Alberta

Yang Liu is the Canada Research Chair in Future Water Services and an NSERC Industrial Research Chair in Sustainable Urban Water Development at the University of Alberta. She develops innovative and economical, health-protective and environmentally friendly technologies used by the wastewater industry, as well as local and municipal governments, to provide Canadians with clean drinking water and wastewater services. Her research thus fosters the development of healthy communities.

MacKILLOP, James – Department of Psychiatry and Behavioural Neurosciences, McMaster University

James MacKillop is a clinician-scientist internationally acclaimed for his research applying behavioural economics and neuroeconomics to understanding addiction. His laboratory has characterized the behavioural, neural, and genetic underpinnings of dysregulated decision making in addictions, and extended these findings to treatment and public policy. His work has been recognized by awards from the Society for Addiction Psychology, the Research Society on Alcoholism, and the American Psychological Association.

MARLAND, Alex – Department of Political Science, Memorial University of Newfoundland

Alex Marland is recognized as a leading scholar of Canadian politics whose work focuses on how Canadian politicians and governments manage communication, and of the politics of Newfoundland and Labrador. He leads diverse groups of academics in public policy projects that connect with journalists, parliamentarians and the public sector. His innovative research revealing the inner workings of politics in this country has won several awards.

MUMTAZ, Zubia – School of Public Health, University of Alberta

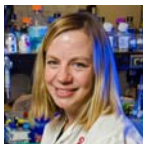
Zubia Mumtaz is an international leader in global maternal and reproductive health. Her research brings cutting-edge science and scholarship to address a key contemporary challenge—how can we reduce maternal mortality amongst poor, socially marginalized women living in fragile, often conflict-affected countries. Her policy-relevant research has been directly translated into national and global maternal health policies. Numerous research fellowships and grants confirm her outstanding achievements.

PELLETIER, Fanie – Département de biologie, Université de Sherbrooke

Fanie Pelletier holds a Canada Research Chair in Evolutionary Demography and Conservation in the Department of Biology at the Université de Sherbrooke. Author of more than 120 peer-reviewed publications, her research focuses on the evolutionary ecology of vertebrates including life-history evolution, reproductive strategies, and population dynamics. She has used innovative methods to demonstrate how human activities affect wild populations.

PILLAI RIDDELL, Rebecca – Department of Psychology, York University

Rebecca Pillai Riddell, Full Professor and Associate Vice-President Research at York University, has focused her research in the pediatric behavioural sciences (Psychology). She built the largest cohort internationally studying children through painful vaccinations over the first years of life. She is generating an unrivalled published literature on the socio-behavioural dimensions of young children's pain and created the first theoretical model to uniquely capture the biopsychosocial context of the pained infant.



RAYNER, Katey – Department of Biochemistry, Microbiology, & Immunology, University of Ottawa

Katey Rayner is an Associate Professor and Principal Investigator at the University of Ottawa Heart Institute and Director of the Cardiometabolic microRNA Laboratory. She is an internationally recognized leader in the cellular and molecular mechanisms driving cardiovascular disease, and her work has identified novel microRNA- and inflammatory-based mechanisms that contribute to atherosclerosis and obesity. Her work has significant translational implications on the development of novel therapeutics and diagnostic tests to identify at-risk individuals.

RICCIARDELLI, Rosemary – Department of Sociology, Memorial University of Newfoundland

Rosemary Ricciardelli's research is centred on interpretations of gender and experiences of vulnerabilities within systems of criminal justice. Her expertise includes prison culture and the coping strategies, risk perception, mental health and lived experiences of prisoners, correctional workers, and police officers. Her ground-breaking work has informed the creation of presumptive mental health legislation in Newfoundland and Labrador and is also recognized by Correctional Services Canada.

SALOMON, Anne – School of Resource and Environmental Management, Simon Fraser University

Anne Salomon is an applied marine ecologist who builds collaborations across disciplines and sectors to advance the field of conservation science and practice. Dr. Salomon is internationally recognized for illuminating relationships between humans and the productivity, biodiversity and resilience of marine ecosystems to inform ecologically effective and socially just conservation strategies. She works closely with Indigenous communities as research partners and co-producers of knowledge in marine management and conservation efforts.

SCHWEITZER, Marlis – Department of Theatre, York University

Marlis Schweitzer's award-winning scholarship explores the dynamic relationships that shaped performance culture in Canada, the US, and Britain in the long nineteenth century. Since graduating in 2005, she has held multiple SSHRC grants, published two monographs, edited three essay collections, and helmed two major journals. Between 2016-18, she served as President of the Canadian Association for Theatre Research. She is currently the chair of the Department of Theatre at YorkU.

SHAW, Pamela – Department of Community Planning and Geography, Vancouver Island University

Pamela Shaw is an award-winning, enthusiastic, visionary professor with a teaching practice that focuses on social innovation, creative knowledge mobilization, and applied, community-based research that connects the boundless energy of students to "real life" issues with local governments, First Nations, and community organizations. She is an unstoppable force with a passion for community planning, community service, engagement, and creating deep connections between communities and the university.

STRAEHLE, Christine – Graduate School of Public and International Affairs, University of Ottawa

Christine Straehle, working at the intersection of moral and political philosophy and public policy, is renown for her work on defining what justice in migration and justice in health would mean. Straehle is the author of numerous articles and the editor or co-editor of several volumes, including most recently, *The Political Philosophy of Refuge* (Cambridge University Press, 2019).

TABARD-COSSA, Vincent – Département de physique, Université d'Ottawa

Vincent Tabard-Cossa is a biophysicist dedicated to developing novel techniques and advanced nanofluidic devices to characterize single-molecules, to unraveling the physics governing the behaviour of biological molecules, and ultimately to translating these discoveries into new technologies for the health sciences. He is well known for the pioneering of a simple, yet remarkably precise nanofabrication technique for making nanopores, which is helping to democratize nanopore-based research.

THOMBS, Brett – Department of Psychiatry, McGill University

Brett Thombs is recognized internationally for his innovative methods in developing, testing, and disseminating programs to support quality of life for people living with rare diseases, for his leadership in developing novel methods for depression screening and in preventive health care generally, and for his research on health care research methods and reporting. Dr. Thombs is the Chair of the Canadian Task Force on Preventive Health Care.

VETRONE, Fiorenzo – Centre for Energy, Materials and Telecommunications, Institut national de la recherche scientifique

Fiorenzo Vetrone is a physical chemist who has made seminal contributions to the field of rare earth materials. His work on rare earth doped nanoparticles is internationally regarded and has led to a number of breakthroughs including the unraveling of their fundamental photophysics at the nanoscale, new techniques to prepare colloidal, multi-architectured and hybrid nanostructured nanomaterials as well as their application in a number of fields including nanomedicine.

WEBBER, Grégoire – Faculty of Law, Queen's University

Grégoire Webber has gained international recognition for his research on human rights, public law, and the philosophy of law. A Canada Research Chair at Queen's University and committed public servant, he has worked for the Privy Council Office, served as Legal Affairs Advisor to the Minister of Justice and Attorney General of Canada, and received a Meritorious Service Medal from the Governor General for founding the Supreme Court Advocacy Institute.

ZHU, Zheng Hong (George) – Department of Mechanical Engineering, York University

Zheng Hong (George) Zhu is Professor, Tier I York Research Chair, and Inaugural Academic Director of Research Commons at York University. He has contributed to astronautics and spacecraft technology by combining fundamental engineering principles with applications for sustainable space use. Dr. Zhu is Fellow of Engineering Institute of Canada, Canadian Society for Mechanical Engineering, and American Society of Mechanical Engineers, and Associate Fellow of American Institute of Aeronautics and Astronautics.

2019 MEDAL & AWARD WINNERS

#RSCBRAVOSRC

Yvan Allaire Medal

For an outstanding contribution in governance of private and public organisations

ANAND, Anita – University of Toronto

Anita Anand, Faculty of Law, University of Toronto, is one of the world's leading scholars of corporate governance. Professor Anand's foundational research has significantly altered global thinking about best practices for boards of directors, including the importance of diversity on boards. She has identified gaps in the law that undermine investors' interests and has proposed effective solutions to ensure that their rights are protected. As the author of multiple groundbreaking publications relating to governance, she is a worthy recipient of this medal.

igopp Institut sur la gouvernance d'organisations privées et publiques

Henry Marshall Tory Medal

For outstanding research in any branch of astronomy chemistry, mathematics, physics, or an allied science

DAHN, Jeff – Dalhousie University

Jeff Dahn is a world leader in energy storage technologies. Dahn has made important discoveries of new electrode materials and electrolyte components which have been incorporated in lithium-ion batteries. His recent work, concentrating on increasing the energy density, improving the lifetime and lowering the cost of lithium-ion batteries, led to the development of high-precision coulometry—enabling the decades-long life span of modern Li-ion cells to be ranked in several weeks.

McLaughlin Medal

For important research of sustained excellence in medical science

DOOLITTLE, Ford – Dalhousie University

W. Ford Doolittle focuses on genome evolution, making theoretical contributions concerning origins of introns, selfish and junk DNA, endosymbiosis, lateral gene transfer and the Tree of Life. His lab importantly contributed to cyanobacterial molecular biology, archaeal genetics, molecular phylogenetics and metagenomics. He received NSERC's Herzberg Gold Medal (2014) and a Killam Prize (2017), and is a member of the Royal Society of Canada and the US National Academy of Sciences.

Alice Wilson Award (CIHR)

To three women of outstanding academic qualifications in the Arts and Humanities, Social Sciences or Science who are entering a career in scholarship or research at the postdoctoral level

DOSSA, Fahima – University of Toronto

Fahima Dossa is a surgical resident and health services researcher at the University of Toronto. Her postdoctoral research examines how inconclusive results from genetic testing for hereditary breast and ovarian cancer influence women's healthcare decisions and cancer risk. This research will be foundational to understanding the true impact of genetic testing, which is especially important as testing becomes more widely available.

Alice Wilson Award (NSERC)

To three women of outstanding academic qualifications in the Arts and Humanities, Social Sciences or Science who are entering a career in scholarship or research at the postdoctoral level

FANG, Yuan – McGill University

Yuan Fang's innovative research lays at the interface of organic and materials chemistry. Her doctoral studies at KU Leuven focused on unravelling the structural-function relationship and fundamental science of molecular assemblies on surfaces using scanning probe microscopy (SPM) techniques. As a postdoctoral fellow at McGill University, Fang is interested in developing novel π-conjugated Covalent Organic Frameworks (COFs) and their implementation in optoelectronic devices (thin film field-effect transistors, photovoltaics, etc).

Rutherford Memorial Medal in Physics

For outstanding research in physics and in chemistry

FRANÇOIS, Paul – McGill University

Paul François is a leading theoretical biophysicist working in the general area of mathematical modelling of living systems. His research in collaboration with experimentalists helped uncovering the biophysical principles of embryonic development, in particular vertebrae formation. Prof. François has also made seminal contributions to the emerging field of quantitative immune recognition, proposing the new theoretical principle of "adaptive kinetic proofreading" predicting the mechanism by which ligand antagonism impinges immune detection.

Sir John William Dawson Medal

For important contributions of knowledge in multiple domains

JAYAS, Digvir S. – Distinguished Professor, Department of Biosystems Engineering, and Vice-President (Research and International), University of Manitoba

Digvir S. Jayas is a former Tier-I Canada Research Chair in Stored-Grain Ecosystems. Over the last 30+ years, he has integrated principles of engineering and biology to revolutionize our understanding of grain storage and made major contributions to improving the practice of grain storage throughout the world. In 2018, he was appointed as an Officer of the Order of Canada. In 2019, the Canadian Society for Bioengineering recognized him as the "father of horizontal airflow drying".

Yvan Allaire Medal

For an outstanding contribution in governance of private and public organisations

LABELLE, Réal – HÉC Montréal

Honorary professor at HEC Montréal, Réal Labelle was appointed by the Minister of finance to the board of L'Autorité des marchés financiers. He has been the founding president of *L'Association Académique Internationale de Gouvernance*, the president of the Canadian Academic Accounting Association and the Stephen-A.-Jarislowsky Chair in governance. With more than 200 publications including one book, he has earned several academic awards and is internationally recognized for his research on the role of financial information, forensic accounting and diversity in governance.

igopp Institut sur la gouvernance d'organisations privées et publiques

Jason A. Hannah Medal

For an important publication in the history of medicine

MITCHINSON, Wendy – University of Waterloo, for her book "Fighting Fat"

Wendy Mitchinson is a distinguished professor emerita of history and an internationally recognized scholar in the medical treatment of women. Author of several groundbreaking studies in Canadian women's history, she was the Canada Research Chair in Gender and Medical History from 2006 to 2013. The research and writing of her most recent book, *Fighting Fat: Canada 1920-1980*, was initiated during that time.

AMS healthcare
Transforming Education and Practice

Miroslaw Romanowski Medal

For scientific work relating to environmental problems

POMEROY, John – University of Saskatchewan

John Pomeroy's research has dramatically improved the understanding and prediction of hydrology and climate where snowcovers form and melting snow and ice provide freshwater. He is the world's most cited snow hydrologist. His research explores fundamental hydrological processes in the field and predicts future water supply and quality using sophisticated computer simulation models. He directs the largest and most highly cited freshwater research programme in the world, Global Water Futures.

Alice Wilson Award (SSHRC)

To three women of outstanding academic qualifications in the Arts and Humanities, Social Sciences or Science who are entering a career in scholarship or research at the postdoctoral level

ROSSY, Katherine

Katherine Rossy is an internationally acclaimed emerging scholar with expertise in international organizations, humanitarian systems and human rights. She completed her SSHRC-funded doctoral studies at Queen Mary University of London, where she examined United Nations' recovery operations toward displaced children after WWII. As SSHRC Postdoctoral Fellow at Carleton University, Dr. Rossy is currently researching emergency humanitarianism toward children from WWII to the Universal Declaration of Human Rights (1939-48).

Rutherford Memorial Medal in Chemistry

For outstanding research in physics and in chemistry

SEFEROS, Dwight – University of Toronto

Dwight Seferos's innovative approaches to the design of polymers for electronic applications have developed a new field in chemistry: heavy atom substitution in electronically active molecules and materials. His pioneering studies on tellurophenes have garnered international acclaim in the development of these interesting materials and their implementation in polymer-based electronic devices. His research group has also established bio-based polymers for battery applications, which are poised to make disruptive advances in battery research and technology.

Kitty Newman Memorial Award

For outstanding contributions from an emerging scholar in the field of philosophy

STRAEHLE, Christine – Université d'Ottawa

Working at the intersection of moral and political philosophy and public policy, Christine Straehle is renowned for her work on defining what justice in migration and justice in health would mean. Straehle is the author of numerous articles and the editor or co-editor of several volumes, including most recently, *The Political Philosophy of Refuge* (Cambridge University Press, 2019).

Pierre Chauveau Medal

For a distinguished contribution to knowledge in the humanities

VIOLA, Lynne – Department of History, University of Toronto

Lynne Viola has been a Professor of Russian History at the University of Toronto since 1988. In 2011, she was appointed University Professor and in 2014, she was inducted into the Royal Society of Canada. She received the Molson Prize from the Canada Council for the Arts in 2018 and the Killam Prize in the Humanities in 2019. She is the author or editor of multiple works, including *The Unknown Gulag* and *Stalinist Perpetrators under Stalin*.

INSTITUTIONAL MEMBERS

WELCOME TO CFI AND MOUNT ROYAL UNIVERSITY

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.

IN MEMORIAM 2019

MEMBERS

Academy of the Arts and Humanities

Edward Blodgett, Division of Arts, Elected 1986

Jerome Chen, Division of Humanities, Elected 1981

Jean-Claude Dubé, Division des lettres et des sciences humaines, Élu 1989

Gilles Langevin, Division des lettres et des sciences humaines, Élu 1979

Jane Millgate, Division of Humanities, Elected 1986

Blair Neatby, Division of Humanities, Elected 1977

Peter E. Pope, Division of Humanities, Elected 2012

A. George Rigg, Division of Humanities, Elected 1988

Yves Roby, Division des lettres et des sciences humaines, Élu 1993

Priscila Uppal, Division of Arts, Elected 2014

Academy of Social Sciences

Cyril Belshaw, Division of Social Sciences, Elected 1969

Kenelm Burridge, Division of Social Sciences, Elected 1977

Jean-Charles Chebat, Division of Social Sciences, Elected 1996

Robert Cox, Division of Social Sciences, Elected 1992

Jean-Marc Martel, Division of Social Sciences, Elected 2002

Robert Milne, Division of Social Sciences, Elected 1980

Robert Paine, Division of Social Sciences, Elected 1978

Gilles Paquet, Division des science sociales, Élu 1976

Donald Stuss, Division of Social Sciences, Elected 2004

Ronald Watts, Division of Social Sciences, Elected 1997

Gilbert Winham, Division of Social Sciences, Elected 1994

Mark Zacher, Division of Social Sciences, Elected 1989

Academy of Science

Frederick Andermann, Division of Life Sciences, Elected 2011

Arthur Bourns, Division of Mathematical and Physical Sciences, Elected 1964

Erwin Buncel, Division of Mathematical and Physical Sciences, Elected2014

Walter Craig, Division of Mathematical and Physical Sciences, Elected 2007

Richard Fedorak, Division of Life Sciences, Elected 2011

Laurie Hendren, Division of Mathematical and Physical Sciences, Elected 2012

Kuo Kao, Division of Life Sciences, Elected 1985

Paul Kebarle, Division of Mathematical and Physical Sciences, Elected 1978

Robert Kisilevsky, Division of Life Sciences, Elected 2007

J. Ross MacKay, Division of Earth, Ocean and Atmospheric Sciences, Elected 1959

Lloyd MacLean, Division of Life Sciences, Elected 1971

Richard Pharis, Division of Life Sciences, Elected 1988

Huw Owen Prtichard, Division of Mathematical and Physical Sciences, Elected 1979

M.D. Azizur Rahman, Division of Earth, Ocean and Atmospheric Sciences, Elected 2015

Miura Robert, Division of Applied Sciences and Engineering, Elected 1995

Martha Salcudean, Division of Applied Sciences and Engineering, Elected 1994

Bruce Sells, Division of Life Sciences, Elected 1982

Ken Standing, Division of Mathematical and Physical Sciences, Elected 2004

John Stothes, Division of Mathematical and Physical Sciences, Elected 1976

Zdenek Velenta, Division of Mathematical and Physical Sciences, Elected 1972

Leo Vining, Division of Life Sciences, Elected 1974

Mladen Vranic, Division of Life Sciences, Elected 1997

A.D.B. Woods, Division of Mathematical and Physical Sciences, Elected 1982

THE NEXT STEPS FOR SUSTAINABLE SCIENCE ADVICE IN CANADA

RSC POSITION PAPER, DECEMBER 2018

Executive Summary

We live in an epoch of human history when social, technological and environmental changes are accelerating in ways that increase exponentially the complexity of policy-making and regulation. It is therefore more urgent than ever for governments to obtain sound expert advice before acting, especially in formulating public policies. Yet, paradoxically, falsehoods can now propagate globally in seconds, encouraged by a growing number of leaders around the world who actively disparage the sciences, their proponents and practitioners, and their conclusions.

In this context, governments must depend on a robust science capacity that can be brought to bear on the key questions of today, and to prepare for those of tomorrow. Fortunately for Canada, transformative federal leadership has underpinned the emergence and development since the 1970s of a world-class science capacity. This federal leadership has been significantly renewed since 2015, and Canada is internationally praised for the quality and breadth in fields across the natural and health sciences, humanities, engineering, arts, and social sciences. Moreover, this quality and breadth characterizes campuses and insitutions across provinces and territories.

Unfortunately, though, a significant gap separates this world-class science capacity from actual government decision-making. Few clear pathways enable and facilitate engagement between those inside government and leading scientists and scholars across Canada, the vast majority of whom receive federal research funding. Decisions have been taken recently to coordinate and strengthen science inside government, as well as to improve collaboration across federal extramural research agencies. However, federal action has not been taken to close the internal-external gap. The result is that the federal government cannot effectively and efficiently call upon Canada's world-class science capacity to help address all the urgent social, technological and environmental challenges that face government decision-makers in the 21st century.

Recognizing this context, the RSC's Strategic Plan for 2018-2022 emphasized with increased urgency its historic position that expert, independent, and objective scientific advice is fundamental to policy development and decision-making. The RSC committed to the "implementation of a sharpened focus for contributing advice to policy and public discussion". That commitment builds on the RSC's Position Paper in 2015, which set out the vital importance of science advice, and the attributes that ideally characterize both such advice and the structures/personnel to deliver it.

The federal government responded quickly to recommendations from the RSC and others to follow through on a 2015 platform promise to re-establish the position of Chief Science Advisor. The platform in the same breath committed that the Chief Science Advisor would ensure "that scientific analyses are considered when the government makes decisions." The machinery to fulfill that promise, however, remains inadequate. It is now urgent that attention be focused on closing the inside-outside gap through creation of explicit pathways that enable and facilitate external science advice. Specifically, the RSC suggests there are two crucial next steps:

1. The RSC recommends that Canada's Chief Science Advisor be formally recognized as the Government's key interlocutor connecting external science and government, and that this role be embodied in legislation. In particular, the Chief Science Advisor must be empowered to clarify and strengthen the Government's internal processes for determining an agenda of issues requiring external scientific advice.

2. The RSC recommends that the Government of Canada act expeditiously to create a high- level science and technology advisory committee, and that this committee be embodied in legislation. We further recommend that the CSA serve as co-chair (or chair) with an external co-chair (or vice-chair) selected from among the appointees by the Government of Canada. We further recommend that the presidents of the Royal Society of Canada along with the Canadian Academy of Health Sciences and the Canadian Academy of Engineering sit ex- officio on the new committee in order to strengthen government knowledge of, and access to, leaders across Canada's science communities.

The full text paper is available on the RSC website.

ARTIFICIAL INTELLIGENCE AND SOCIETY

STATEMENT OF THE G7 SCIENCE ACADEMIES, MARCH 2019

Artificial intelligence and society

Executive summary and recommendations

Executive summary and recommendations
Artificial intelligence (AI) is one of the technologies that is transforming our society and many aspects of our daily lives. AI has already provided many positive benefits and may be a source of considerable economic prosperity. It also gives rise to questions about employment, confidentiality of data, privacy, infringement of ethical values and trust in results.

Policy makers should encourage and scientists should commit to:

- **Careful stewardship is necessary to help share the benefits of AI across society**. This will require close attention to the impact of AI on employment which will be in turn shaped by a range of factors including political, economic, and cultural elements, as well as progress in AI technologies.
- **AI systems and data should be trustworthy**. This should be facilitated through measures addressing the quality, lack of bias and traceability of data. While this can be further aided by making the data more accessible, personal data should not be made available to unauthorized parties.
- **AI systems and data should be safe and secure**. This is essential in the case of applications that involve human vulnerability and may require provably correct systems.
- **Further research is needed to help develop explainable AI systems**. When important decisions are suggested by AI impacting people, those concerned should be given sufficient information and be allowed to challenge the decisions (e.g., refuse a treatment or appeal a decision).
- **Insights from many fields are needed in order to maximize the societal benefits of AI**. Interdisciplinary research should involve diverse fields such as natural, life and medical sciences, engineering, robotics, humanities, economic and social sciences, ethics, computer science and AI itself.
- **Citizens need to be AI-ready**. A range of AI educational opportunities and information should be available and a well-founded dialogue with citizens is required to demystify this field.
- **Public policy debate on the destructive/military usage of AI should be promoted**. International undertakings limiting the risks of autonomous weapons should be considered by the relevant UN body.
- **Talent exchanges and cooperation between public research and private sector should be encouraged**. This would facilitate safe and rapid deployment of applications in areas of great human benefit. Collaboration is important for large-scale collection of data that are crucial for developing AI systems.

CITIZEN SCIENCE IN THE INTERNET ERA

STATEMENT OF THE G7 SCIENCE ACADEMIES, MARCH 2019

Citizen science in the Internet era

Executive summary

Citizen science is by definition carried out by citizens who are not « scientific professionals ». It is changing rapidly, as a result of the democratization of knowledge, new and faster communication technologies and increased open access to information.
A first - and major- component of citizen science is the 21st century version of the long established « Community-Based Participatory Research ». CBPR is usually performed by people with little formal scientific training participating in research projects coordinated by trained experts. It now takes the form of many projects across the world involving millions of people and billions of data items collected.
A second emerging component involves individuals having a solid scientific background, but working outside the walls of the usual professional research systems. They do science in public or private virtual communities or in private settings. This category of citizen science is referred to, here, as "Beyond The Walls Research" (BTWR).

In the present Internet era, the potential value of these approaches to research is high: CBPR may contribute to improving public understanding of science and the scientific method, and can thus play a role in democratizing knowledge and learning. BTWR offers an opportunity to advance knowledge and innovation in ways that were previously inaccessible to the academic, government or industrial organizations of research, and constitutes an opportunity – widely used by industry - to discover talented individuals outside the standard research system.

Alongside these potential benefits come risks, especially around the evaluation of results stemming from CBPR and BTWR. These results are often disseminated through diverse channels outside the traditional peer-review system. There are also risks that ethical guidelines and safety regulations that apply to research carried out in the standard professional framework are not followed by those engaged in this new citizen science and, therefore, there is a need for anticipation and control.

Finally, the development of citizen science requires an increased effort in the scientific training of the citizen at all ages, starting at school, and the integration of perspectives in the arts and humanities, law, education, social sciences and ethics as well as natural sciences and engineering.

Recommendations

The detailed recommendations are at the end of the statement.

- Rethink scientific education to equip students to undertake citizen science or professional research later on.
- Take action to avoid or mitigate ethical lapses and security risks of citizen science.
- Promote the co-development of citizen science and laboratory-based research.
- Enable citizen scientists to adopt existing culture of reporting and assessing scientific contributions.
- Create specific funding programs for citizen science.
- Promote information systems to document themes and results of citizen science.

Science and trust

Executive summary and recommendations

To reinforce trust in science, we recommend more comprehensive education about the scientific method; an improved dissemination of science to the public; communication modes that do not minimize doubts or exaggerate promises; a requirement for rigor and integrity from scientists; improvements in science assessment emphasizing quality and relevance; and better dialogue between scientists, social groups, and decision makers to inform choices about the major issues facing society.

The increasing pace of technological change, and the need for science and innovation contributions to solve local and global challenges requires societal trust in science. It is essential that we find ways to maintain and increase confidence in science. It is the responsibility of everyone, scientists, educators, the media and politicians to establish or maintain a relationship of informed trust between science and society.

Policy makers should encourage and scientists should commit to:

- Promote science education and an understanding of how research is conducted from elementary school onwards, to ensure that all students, both girls and boys, acquire a sufficient background to understand the world around them and the benefits of science.
- Cultivate dialogue, mutual trust and confidence between public, politicians and scientists to ensure that scientific input is considered in decision-making especially on topics of high scientific content.
- Ensure that the fundamental principles of ethics, integrity and responsibility are a major component of science education, to increase awareness of scientific responsibility and of the structures and policies that support it, including peer review and research ethics boards and transparency about potential conflicts of interest. Breaches of ethics and research integrity should be treated with full transparency and rigor to ensure that the misconduct of a few does not discredit the whole scientific endeavor.
- Ensure that the evaluation of science is based on criteria of quality, reproducibility, originality and relevance rather than on counts of publications, citations, or impact factors to avoid the race for publication that downgrades the value of scientific research and can lead to breaches in scientific integrity.

Introduction

The scientific method and scientific knowledge about humans, societies and the world around us has been one of the drivers of human life, and an undeniable source of progress for centuries. Scientific knowledge, with the growth of research and the technologies that accompany it, belongs to the

SUSTAINING CANADIAN MARINE BIODIVERSITY: POLICY AND STATUTORY PROGRESS

POLICY BRIEFING COMMITTEE REPORT, NOVEMBER 2019

Background

In 2009, the *Royal Society of Canada (RSC)* identified a series of urgent scientific and public policy questions. It established a series of five Expert Panels to study the issues and provide recommendations for next steps. It is now timely to revisit the findings of these Expert Panel Reports. What impact have they had? Have their recommendations been implemented? What are the next steps in terms of policy options?

To answer these questions, the RSC is establishing a Policy Briefing Committee (PBC) for each Expert Panel Report. The tasks of each PBC are to:

- describe the context, findings, and recommendations of the report;
- track policy developments in relation to the panel's findings and recommendations; and
- identify future policy challenges and implementation options.

An important distinction from the work of each original expert panel is that the PBCs will not undertake reviews of the scientific literature, but instead focus on matters with respect to findings and recommendations issued by the reports and subsequent public policy developments.

This Policy Briefing Committee Reports examines policy and statutory developments since publication of the RSC's 2012 Expert Panel Report on Sustaining Marine Biodiversity: Responding to the Challenges Posed by Climate, Change, Fisheries, and Aquaculture.

Members

Prof. Julia K. Baum, Department of Biology, University of Victoria

Dr. Susanna D. Fuller, Senior Projects Manager, Oceans North

Prof. Jeffrey A. Hutchings, FRSC, Department of Biology, Dalhousie University, (Chair)

Mr. Josh Laughren, Executive Director, Oceana Canada

Prof. David L. VanderZwaag, Canada Research Chair in Ocean Law and Governance, Marine & Environmental Law Institute, Schulich School of Law, Dalhousie University

Executive Summary

Overarching Findings of the 2012 Expert Panel

- Canada faces significant challenges in its efforts to conserve and sustain marine biodiversity in light of climate change, fisheries, and aquaculture;
- Canada should fulfil national and international obligations to protect existing diversity and to rebuild depleted populations and species to restore natural diversity;
- Such a strategy would restore the natural resilience of Canada's ocean ecosystems to enable them to adapt in response to challenges posed by climate change and other anthropogenic activities.

Impact of the 2012 Expert Panel Report on Sustaining Marine Biodiversity

- The Report has been cited more than 75 times in documents, reports, and other submissions by NGOs, Government, Industry-Affiliated Organizations, and Academia;
- The Report has had impact by providing an objective assessment of, and recommendations for, strengthening commitments to sustain marine biodiversity;
- There have been significant developments to Canadian policy and law, including amendments to the *Fisheries Act*, that align with the Report's recommendations.

Policy and Statutory Developments Since the 2012 Expert Panel Report

Good Progress by the Government of Canada is reflected by:

- prioritizing oceans stewardship and biodiversity conservation;
- strengthening the evidentiary use of science in decision-making;
- amending statutes, such as the *Fisheries Act* and *Oceans Act*;
- exceeding the goal to protect 10% of marine and coastal areas by 2020;
- increasing transparency & accountability through public release of mandate letters.

Moderate Progress by the Government of Canada is reflected by:

- explicit provisions for stock rebuilding in the *Fisheries Act*;
- statutory application of a Precautionary-Approach fisheries reference point;
- consultations on the development of potential federal aquaculture legislation;
- public reporting of progress in achieving targets for biodiversity and fisheries status;
- increased transparency on listing decisions for aquatic species at risk.

There has been ***Limited or Insufficient Progress*** in:

- incorporating climate change in decisions on fisheries, oceans, or marine biodiversity;
- resolving regulatory conflict (conserve/exploit) within Fisheries & Oceans Canada;
- marine spatial planning to mitigate conflict as ocean-use pressures increase;
- reducing ministerial discretion on matters related to fisheries and oceans;
- clarifying ambiguities in sustainable fisheries policy on the Precautionary Approach.

Tracking Policy and Statutory Progress Since 2012

RSC 2012 Expert Panel Recommendation 1:

Establish international leadership in oceans stewardship and biodiversity conservation as a top government priority.

Good Progress: (i) policy and statutory renewal; (ii) public release of mandate letters; (iii) new investments in government science; and (iv) multiple audits under the auspices of the Office of the Auditor General.

RSC 2012 Expert Panel Recommendation 2:

Resolve regulatory conflicts of interest within DFO (i.e., Fisheries & Oceans Canada) that affect Canada's obligation to sustain marine biodiversity.

Limited Progress: (i) new provision in the *Fisheries Act* for independent advisory bodies; and (ii) increased ministerial accountability through publicly available mandate letters.

RSC 2012 Expert Panel Recommendation 3:

Reduce the discretionary power in fisheries management decisions exercised by the Minister of Fisheries and Oceans.

Moderate Progress evidenced by a new *Fisheries Act* that: (i) provides for stock rebuilding; (ii) formalizes application of a Precautionary-Approach fisheries reference point; and (iii) provides for establishment of independent advisory bodies.

RSC 2012 Expert Panel Recommendation 4:

Rapidly increase DFO's rate of statutory and policy implementation.

Limited Progress: (i) revised *Oceans Act* allows for increased establishment of Marine Protected Areas; (ii) new commitment to render listing decisions under the *Species at Risk Act* within 36 months; and (iii) new statutory acknowledgement, in the *Fisheries Act*, of elements of Sustainable Fisheries Framework policies.

RSC 2012 Expert Panel Recommendation 5:

Implement statutory renewal to fulfil national and international commitments to sustain marine biodiversity.

Moderate Progress reflected by: (i) amended *Fisheries Act*, *Oceans Act*, and *Canada Petroleum Resources Act*; (ii) consultations on potential federal aquaculture legislation; and (iii) new policy for species-at-risk listing decisions for aquatic species.

RSC 2012 Expert Panel Recommendation 6:

Establish national operational objectives, indicators, and targets for marine biodiversity.

Moderate Progress reflected by (i) national reporting of progress towards achieving Canada's biodiversity targets and (ii) audits to track progress in improving marine fisheries stock status and implementing marine policy commitments.

Looking Ahead: Recommendations

1. Ensure climate change impacts and projections are incorporated into decision making and planning processes related to marine biodiversity.

- Effects of climate change on species and ecosystems are not readily reversible;
- The IPCC (Intergovernmental Panel on Climate Change) 2019 *Special Report on the Ocean and Cryosphere in a Changing Climate* highlighted the urgency of prioritizing ambitious, coordinated action to address unprecedented, enduring ocean changes;
- Failure to incorporate climate change in ocean-related policies will have significant consequences for Canada's marine biodiversity, fisheries, and aquaculture.

2. Resolve regulatory conflicts of interest affecting progress in fulfilling obligations to sustain marine biodiversity.

- DFO has responsibilities both to conserve and exploit marine biodiversity;
- This regulatory conflict impedes progress in sustaining marine biodiversity;
- Limit or eliminate real and perceived regulatory conflicts of interest; strengthen ministerial accountability for policy commitments to use and conserve biodiversity; financially account for environmental costs associated with biodiversity loss.

3. Limit the discretionary power in fisheries management decisions exercised by the Minister of Fisheries and Oceans.

- Ministerial discretion hinders progress in sustaining marine biodiversity;
- Discretion permits the fishing of stocks in the critical zone, such as NL's northern cod;
- Regulations are required to give effect to the *Fisheries Act's* rebuilding provisions, ideally to maintain stocks at levels that maximize long-term sustainable harvests.

4. Clarify ambiguities in Canada's sustainable fisheries policy framework.

- The Precautionary Approach (PA) is open to misuse and misinterpretation;
- Policy should unambiguously clarify the roles of science, fisheries management, and vested interests in setting PA-compliant rebuilding targets and harvest decision rules;
- Science advice should always be publicly distinguishable from other sources of advice during implementation of the PA in fisheries management decision-making.

5. Advance and implement marine spatial planning (MSP).

- Increased use of coastal waters is intensifying spatial conflict between activities such as infrastructure projects, fishing, aquaculture, shipping, and protected areas;
- Meaningful, respectful, coordinated efforts to advance and implement MSP, with comprehensive zonal ecosystem-based initiatives, has potential to mitigate conflict;
- The *Oceans Act* should be revised to explicitly require MSP, establish clear planning procedures, and provide for enforceability of finalized plans.

HOW TO SUPPORT THE RSC

OPERATIONS

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

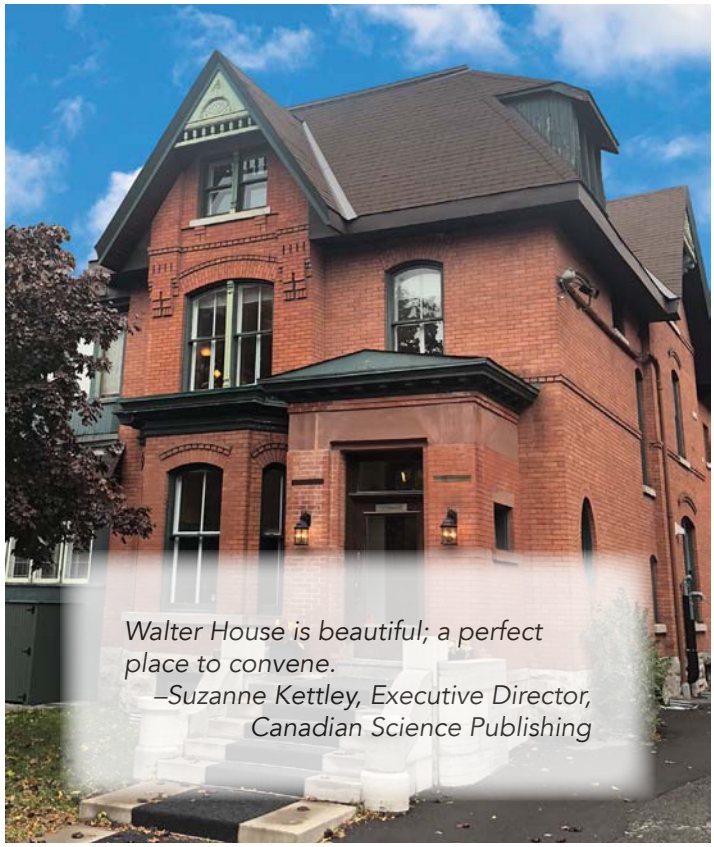
The Annual Fund enables the RSC to enhance programmes and activities to achieve the objectives of the strategic plan.

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.



Walter House is beautiful; a perfect place to convene.
–Suzanne Kettley, Executive Director, Canadian Science Publishing

Key Contacts

Executive Director
Darren Gilmour • dgilmour@rsc-src.ca

Chief Financial & Adminstrative Officer
Linda Clauson • lclauson@rsc-src.ca

Manager, Communications & Publications
Erika Kujawski • ekujawski@rsc-src.ca

Manager, Programmes
Russel MacDonald • rmacdonald@rsc-src.ca

Manager, Fellowship & Awards
Marie-Lyne Renaud • mlrenaud@rsc-src.ca

Assistant, Programmes
Amelia Domaradzki • adomaradzki@rsc-src.ca

Finance and Operations Assistant
Michelle Seguin • mseguin@rsc-src.ca

Executive Assistant
Jo-Anne Sparkes • jsparkes@rsc-src.ca

The Royal Society of Canada

Walter House
282 Somerset Street West
Ottawa, Ontario K2P 0J6
www.rsc-src.ca
info@rsc-src.ca
613-991-6990
@RSCTheAcademies
youtube.com/user/RSCSRC1
flickr.com/photos/rsc-src/albums

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**