

Unlocking science: The rise of Open Science in Canada Perspectives from Early Career Researchers

A Science & Policy Exchange Café



REPORT

Science & Policy Exchange (SPE) is a student-led non-profit organization that aims to assemble students and leaders in government, industry, research, and the community for an exchange of ideas on science and policy issues. To learn more, visit: <http://www.sp-exchange.ca>.

Citation

Unlocking science: the rise of Open Science in Canada - perspectives from Early Career Researchers. Science & Policy Exchange, Montreal, Canada. Sept, 2022. <https://www.sp-exchange.ca/reports>.

Contributors

Vivian Agube², Saina Beitari¹, Mary Chen², Meghomita Das¹, Kaitlyn Easson¹, Manel Ghribi⁴, Morgan Hiebert², Yifan Li¹, My An Nguyen⁴, Sofia Pineda^{1,2}, Hadjara Sidibé^{1,2}, Sonja Soo^{1,3}, Yuan Chao Xue³, Antoine Zboralski^{1,2,4}.

¹Policy Brief Contributor

²Event Moderator and Notetaker

³Report contributor

⁴Translation

All authors contributed equally to their respective sections.

Acknowledgements

SPE is based in Tiohtiá:ke/Montreal, the traditional and unceded territory of the Kanien'keha:ka (Mohawk) - a place which has long served as a site of meeting and exchange amongst many First Nations including the Kanien'kehá:ka of the Haudenosaunee Confederacy (also referred to as the Iroquois or Six Nations Confederacy), Huron/Wendat, Abenaki, and Anishinaabeg. We further acknowledge the deep ties between colonialism and modern western science and research. At SPE, we strive to support indigenous students and researchers by actively reaching out to and working with the Indigenous STEM community to collaboratively advocate for their inclusion in evidence-informed decision-making.

We would like to thank the Canadian Commission for UNESCO (CCUNESCO) for supporting this Café. We are further grateful for SPE's executive committee for their contributions in their respective roles to the proper development of this project. Finally, we would like to thank the Café's panelists, moderators, and attendees for their contributions to the thoughtful discussions that form the foundation of this report.



SCIENCE & POLICY EXCHANGE
DIALOGUE SCIENCES & POLITIQUES



unesco
Commission canadienne

Executive summary

On June 2, 2022, Science & Policy Exchange (SPE) conducted a virtual SPE Café event that included roundtable discussions with the community to: 1) learn about the importance and practice of open science in Canada; and 2) discuss the role of Early Career Researchers (ECRs) in moving open science forward. The roundtable discussion questions were centered on the [UNESCO Recommendation on Open Science](#). The Café also included presentations from Dr. Masha Cemma and Dylan Roskams-Edris to share their experiences and opinions in the field. In this report, we summarize the guest speaker presentations and roundtable discussions. SPE Café attendees recommend the following policies:

Key Policy Recommendations

For Early Career Researchers:

- Continue learning about open science (through online resources, supervisors, librarians) and join open science initiatives and organizations
- Implement open science practices in your own research

For academic institutions:

- Advocate for open science guidelines or education policies for international collaboration
- Financially support open science practices (i.e. cover cost of open access fees)

For open science organizations:

- Lead awareness campaigns about open science to academic communities
- Conduct workshops to educate researchers about available open science infrastructures
- Advocate for a credit system added to the author list on manuscripts to encourage collaboration

For government:

- Increase funding for data- and research-sharing infrastructure
- Increase funding for open science collaborations on an international level

1. Introduction

Making science open and accessible has been a global priority for decades. The United Nations Educational, Scientific and Cultural Organization (UNESCO) produced a Recommendation on Open Science that was adopted by member states in 2021 [1]. These recommendations aim to facilitate open science through policy, innovation, investment in infrastructure, fostering a culture of open science, and promoting international collaborations [2]. The Canadian Commission for UNESCO (CCUNESCO) also produced a paper in 2020 contextualizing open science recommendations in Canada [3].

On June 2nd, 2022, Science Policy Exchange (SPE) held a virtual Cafe event entitled “Unlocking Science: The rise of Open Science in Canada - Perspectives from Early Career Researchers” in which members of the community could participate in a roundtable discussion about open science. The goals of the cafe were to allow participants to: 1) learn about the importance and practice of open science in Canada; and 2) discuss the role of Early Career Researchers (ECRs) in moving open science forward. The roundtable discussion questions were centered on the UNESCO Recommendation on Open Science.

Our event started with two invited guest speakers (Dr. Masha Cemna and Dylan Roskams-Edris) with experience and expertise in open science in Canada. The speakers gave short presentations about the topic, which was followed by a roundtable discussion in small groups on the UNESCO Recommendation on Open Science. In total, there were around 45 attendees during the guest speaking segment and around 25 participants for the discussion. Many of those who joined the cafe event were ECRs from Canadian universities and members of the community engaging and participating in open science.

In this report, we summarize the key points from the guest speaker presentations and the roundtable discussion, and extract key policy recommendations for each stakeholder.

2. Summary of panelists

Masha Cemma

Policy Advisor, Office of the Chief Science Advisor of Canada

Open science leads to increased public and scientific exposure/access to research and results in higher citation rates and translational values from bench to bedside. In addition, these exposures could also influence public policies. Even with these benefits, the adoption of open science has been different within the different research communities. (Note: The healthcare sector has a higher adoption rate as compared to others).

On the international level, multiple major initiatives are promoting open science including: 1) [Plan S](#), international initiatives for Open Access (for major European national research agencies); 2) [UNESCO Recommendation for Open Science](#) ratified in 2021; and 3) philanthropic organizations/funders. These initiatives advocate for immediate access to scientific publications, incorporation of a data management plan, infrastructure for [FAIR data](#) (findable, accessible, interoperable, reusable), and evaluation of cultural changes within the research community.

Within Canada, the majority of the open science initiatives are driven by the federal government, including the CIHR Open Access Policy (2008), Tri-agency Open Access Policy on Publications (2015), Tri-agency statement of principles on digital data management (2016), DORA declaration (2019) and 2021: Tri-agency Research Data Management Policy (2021). FRQ also announced that they joined coalition S, which will require immediate open access in 2023.

The Chief Science Advisor's Office is taking steps towards open science, which includes ensuring federally-funded science is available to the public through commitment to a [Roadmap for Open Science](#), the formation of an Open Science Advisory Committee to advise on the roadmap, ministerial release of the roadmap and its ongoing implementation. Recently, the Office also held stakeholder roundtable discussions [Open Science Dialogues](#).

Several suggestions for Early Career Researchers include continuing to learn about open science, talking to colleagues and supervisors about open science, talking to librarians at their institutions, forming or joining an open science committee, and sharing their views on open science through public platforms and volunteer organizations.

Dylan Roskams-Edris

Open Science Alliance Officer, Tanenbaum Open Science Institute and The Neuro (McGill University)

The Neuro (Montreal Neurological Institute-Hospital) focuses on advancing therapeutics and knowledge related to neurological disorders. However, very few advances were achieved in the last decade within the Neuro, due to the underlying complexities of different neurological disorders and the limited resources originating from a single institution. In realization of this, the Neuro adopted open science principles to promote inter institutional collaboration. In the Neuro's Open Science policies, the institution shares data, but respects the privacy of patients and individuals involved in research and the respective intellectual properties the collaborating industries hold. The Tanenbaum Open Science Institute (TOSI) group at McGill University promotes open science practice and policies both within the Neuro and to other institutions across Canada.

Within the Neuro, Dylan holds open science "office hours" to provide education, establish peer and mentorship systems, and engage with researchers about Open Science. He is also involved in [NeuroLingo](#), a science communication initiative to help trainees communicate their science to the public. Outside of the Neuro, he is involved in Data Binge, a collective problem-solving program that benefits from the public problem-solving capacity and is on open access frameworks such as GitHub, as well as Trainee Open Science Awards, incentives for trainees to pursue ideas in open science through different media of presentations.

3. Roundtable Discussions Summary

3.1 Promoting science to broader community

As per UNESCO's recommendations, the Cafe attendees were asked how science can be promoted to the broader community, and specifically what ECRs can do to help. It was suggested that ECRs can engage the general public in open science initiatives, learn about their expectations and perceptions on open science. ECRs can use less traditional channels of dissemination such as podcasts and platforms with younger audiences such as TikTok videos, and create engaging programs for young scientists. Grants can be provided to encourage knowledge dissemination and support science journalists, such as creating programs in which journalists spend time at various institutions and amplify open science initiatives. Importantly, planned programs should involve individuals with lived experiences. Lastly, platforms such as the [Open Science Center](#) are highly valuable tools to help researchers improve the openness of their workflow. It offers many services and resources, like repositories for any kind of data (Excel, Google sheets, etc) and also proposes a program to turn young researchers into [open science ambassadors](#) by providing support and training.

3.2 Fostering a culture of open science

UNESCO recommends "Fostering a culture of open science and aligning incentives for open science". The Cafe attendees suggested collective action to support ECRs in open access fees for journals. ECRs can also change the culture by refusing to review manuscripts for journals with high open access fees. Lastly, international networking and collaborative incentives can support open science.

3.3 Approaches to open science at different stages of scientific process

Innovative approaches for open science at different stages of the scientific process include ECRs contributing towards open access data libraries and code catalogs and speaking to peers about how traditional publishing stifles open science.

Institutions can play a part by increasing interdisciplinary collaborations and moving away from subject silos, increasing the affordability of scientific equipment, using more open source hardware (ex. Opentrons), and creating more outreach programs that promote inclusivity and work against discrimination.

3.4 Supporting open science within academia

The cafe attendees voiced that supporting open science should not require updating academic curricula since there are many new researchers who have the knowledge and skills to promote open science, especially young principal investigators and PhD students. These researchers can be the frontline of a cultural change inside academia by showing their peers how to make good open science and training the next generation. It was also suggested that the community should conduct awareness campaigns about open science to the entire academic community. Other suggestions included conducting workshops to inform researchers about infrastructure available to them, incorporating open science principles in undergraduate courses, conducting virtual boot camps that teach the importance of open science before researchers begin work at an organization, and using open source educational resources.

3.5 Policies for promoting and stimulating cross-border multi-stakeholder collaborations

During the SPE Cafe, three ideas were proposed to promote open science collaborative research, specifically with research groups in the United States. First, there should be more government grants for sharing data and research through establishing new funding or increasing current available funding to promote open science collaboration that involves multiple stakeholders. For scientific papers, there should be a credit system in addition to an author list to delineate their role in the project and to encourage collaborative research. Lastly, there should be institutional guidelines that advocate for cross-disciplinary collaboration guidelines or educational policy on an institutional level .

3.6 Collaboration with the Global South

A critical question was raised during the SPE Cafe regarding North/South collaborations is: “How can Canadian researchers work and build collaborations with Global South scholars while avoiding parachute science (i.e., gathering data from local communities without engaging and acknowledging them)?”

First, North/South collaboration can be promoted by establishing additional funding resources. Furthermore, applying lessons learned from working with the Canadian Indigenous communities, these projects would need to address the needs of all stakeholders. Most importantly, these projects would need to have an overall beneficial influence on the local communities. On the other hand, non-profit organizations similar

to Mitacs and Genome Canada could be established to drive research, innovation, and collaboration. They could encourage knowledge exchange and collaborative research outputs between the North and South.

4. References

- [1] “UNESCO Recommendation on Open Science.” UNESCO.
<https://unesdoc.unesco.org/ark:/48223/pf0000379949.locale=en>. 2021.
- [2] “Implementation of the UNESCO Recommendation on Open Science.” UNESCO.
<https://www.unesco.org/en/natural-sciences/open-science/implementation>. 2022.
- [3] “Toward a UNESCO Recommendation on Open Science: Canadian Perspectives.” CCUNESCO.
<https://en.ccunesco.ca/-/media/Files/Unesco/Resources/2020/04/UNESCORecommendationOpenScienceCanadianPerspectives.pdf>. 2020.

Resources

- CCUNESCO: Is Science a Human Right?
<https://en.ccunesco.ca/-/media/Files/Unesco/Resources/2019/10/IsScienceAHumanRight.pdf>
- Roadmap to Open Science. Government of Canada.
https://www.ic.gc.ca/eic/site/063.nsf/eng/h_97992.html
- The Open Science Dialogues. Summary of stakeholders round tables.
https://www.ic.gc.ca/eic/site/063.nsf/eng/h_98359.html
- Centre for Open Science. <https://www.cos.io/>
- CCUNESCO: Open Science Beyond Open Access: For and with communities A step towards the decolonization of knowledge.
<https://en.ccunesco.ca/-/media/Files/Unesco/Resources/2020/07/OpenScienceDecolonizingKnowledge.pdf>.

Appendix:

Panelist Biography

Masha Cemma, PhD

Dr. Masha Cemma is a policy advisor to the Chief Science Advisor of Canada, Dr. Mona Nemer. In that capacity, she supports her on open science and science advice in emergencies. Masha earned her PhD in 2016 from the Department of Molecular Genetics at the University of Toronto. Her first foray into policy work was through a global health fellowship at the World Health Organization that took place during her PhD studies. She further honed her policy chops at the Mitacs Science Policy fellowship.

Dylan Roskams-Edris, JD

As Open Science Alliance Officer for the Tanenbaum Open Science Institute (TOSI), Dylan interfaces with the national and global Open Science communities to promote the uptake of Open Science tools and practices in Canadian neuroscience research. By developing relationships with researchers, research institutes, as well as national and international neuroscience initiatives, Dylan supports the adoption of Open Science through knowledge translation, resource sharing, and administering TOSI's Open Science Support and Partnership Framework.