

Fonds de recherche du Québec

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SCIENCE: THE KEY TO MEETING SOCIETY'S MAJOR CHALLENGES

More than three years have passed since the emergence of the virus responsible for COVID-19. In 2022-2023, both my office and the FRQ were able to return to a certain degree of normal activity, thanks in large part to scientific progress and a new way of working that combines in-office and remote work.

The 2022-2023 financial year also coincided with the International Year of Basic Sciences for Sustainable Development, proclaimed by the United Nations (UN) General Assembly. This declaration reflects my position as chief scientist, and that of the FRQ, on the importance of supporting open basic research to advance knowledge and to respond to the major societal challenges posed by climate change, the environment, the aging population, public safety and democracy... and health crises! Many years of basic research into the role of messenger RNAs led to the development of vaccines against COVID-19. A number of Québec researchers contributed significantly to this work, making many important discoveries about the role of these molecules in the body. Scientific advances and research in all areas of knowledge can contribute to achieving the United Nations Sustainable Development Goals (SDGs). To mark this international year, the FRQ held a forum on the subject. Indeed, open basic research is one of the three key directions of the FRQ's 2022-2025 strategic plans.

There has also been much talk over the past year about open science and open access to scientific publications. This issue is making progress, but we need to keep pace with the rest of the world on this front. I would remind you that the FRQ are signatories to the San Francisco Declaration on Research Assessment (DORA) and members of cOAlition S since 2021. The FRQ directorate of ethical and legal affairs toured colleges and universities to answer questions from people affected by our Open Access Dissemination Policy.

Another important area of focus for our research community: science in French and the "discoverability" of French-language scientific content. Reflections on this question culminated in a major international forum, held under my leadership in Montréal in April 2023. Avenues for action were discussed to tackle the issues and give new impetus to science in French, here and elsewhere in the world. A section of the FRQ website is dedicated to this topic: frq.gouv.qc.ca/la-science-en-francais/.

Over the past year, the number of scientific advisors in cities and municipalities, as well as scientists in residence at international, provincial and municipal levels, has grown steadily. Victoriaville appointed its first Chief Science Advisor in January 2023 and, a few months later, in July, it was the City of Longueuil's turn to create a similar position. What's more, the launch of a new "scientist in residence" program in municipal administrations should soon bear fruit. There is growing interest in this type of initiative among the next generation of scientists, and we will be keeping a close eye in this regard on the FRQ and the International Network for Government Science Advice (INGSA), which I have the honour of serving as president for a second year. As for what comes next, I look forward to it with confidence. Strengthening the link between science and society will enable us, collectively, to meet the challenges of the years ahead. I intend to end my third term as Québec's chief scientist on a most promising note and with renewed energy... in the hope that the spectre of the COVID-19 pandemic continues to keep a low profile.



Rémi Quirion, OC, CQ, PhD, FRSC
Chief Scientist of Québec

Chief Scientist of Québec's Report

2022-2023

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Québec 

CONTEXT

At the very start of our new year in September 2022, Québec was in the midst of an electoral campaign. The Coalition avenir Québec (CAQ) emerged from the polls with a second mandate and François Legault was easily re-elected Premier of Québec. Since continuity can nonetheless lend itself to change, in the months following the election I embarked on a tour of visits to the new ministers. My aim was to build bridges, renew contacts and explain my mandates, including those of science advisor to the government and head of the FRQ. Our minister, Pierre Fitzgibbon, with whom we have a very good relationship, was also easily re-elected and saw his mandate broadened to include the energy sector - an important area of research that is already supported by the FRQ, but which we can certainly enhance. This tour was an opportunity to discuss how science can contribute to the ministers' priority areas, and to explore possible collaborations.

I was also pleased to be able to resume my scientific missions abroad, both in connection with my mandate as president of INGSA and as head of the FRQ. These included participation as a speaker at the Organisation internationale de la Francophonie summit in Tunisia in November 2022, and the World Conference of Science Journalists (WCSJ) in Colombia in March 2023.

Still on the subject of international activities, the first-ever international francophone network on science advice, the Réseau international francophone en conseil scientifique (RIFCS), was officially launched in Montréal in November 2022. The RIFCS operates through branches in Africa and Europe and is INGSA's first linguistic division. It is another step in the right direction for promoting science in French on an international scale.

Closer to home, over the past year I have had the pleasure of meeting with several mayors and municipal associations. There is clearly a keen interest in creating positions for chief science advisors in Québec cities and municipalities. INGSA's North American chapter will be focussing on increasing training and capacity in science advice at municipal and local levels. Local municipal policy needs to be informed by scientific expertise.

In 2022-2023, the FRQ teams continued their admirable work and carried out their activities successfully, all the while supporting the research community with great professionalism. The FRQ continued to build on their momentum with the finalization, approval and implementation of their 2022-2025 strategic plans, whose directions and objectives are in line with the priorities of the new Québec research and innovation investment strategy 2022-2027 (QRIIS²). I would remind you that this strategy allocates a budget of \$1.2 billion over five years to the FRQ to promote the growth of research in Québec.

KEY ACHIEVEMENTS

…❖ Supporting the next generation of researchers and science in exile

INCREASE IN THE VALUE OF MASTER'S AND DOCTORAL SCHOLARSHIPS

The Québec 2023-2024 budget offered good news for Québec's student community with an increase in the value of master's and doctoral excellence scholarships. This government boost of \$50 M over five years will help many students to successfully begin or continue their studies. The annual value of a master's scholarship will increase from \$17,500 to \$20,000 starting in 2023-2024, while the annual value of a doctoral scholarship will increase from \$21,000 to \$25,000, also as of 2023-2024. This increase is the result of the FRQ's efforts to raise awareness among government authorities. The unflagging support of Québec's Minister of Finance, Eric Girard, for research and science is invaluable and deserves special mention.

CONTINUATION OF THE SCIENCE EN EXIL PROGRAM AND EXPANSION TO OTHER COUNTRIES

The FRQ Science en Exil support program, which was initially developed after the outbreak of war in Ukraine and intended for the Ukrainian and Russian research communities, has been continued and expanded to other countries. It now has three components: researchers, students, and extension of student awards. The program is aimed at research communities from countries experiencing an emergency situation that threatens the immediate safety, lives, property or environment of individuals. This initiative is in line with the desire of the FRQ and Québec's chief scientist to contribute to global solidarity efforts with scientific communities affected by sudden major crises in their countries.

…❖ Research directions

IMPLEMENTATION OF THE QRIIS²

2022-2023 saw a number of meetings focused on the rollout of the Québec research and innovation investment strategy 2022-2027 (QRIIS²), with the Ministère de l'Économie, de l'Innovation et de l'Énergie, Québec's Chief Innovator, Investissement Québec, and members of the Interministerial Committee on Research and Innovation (CIRI). The aim was to implement the new model for the innovation cycle (research, innovation, commercialization). Discussions centered on new forms of green energy, the circular economy, and training the next generation of scientists in these sectors. Québec's chief scientist also actively participated in consultations on digital technologies, artificial intelligence (ChatGPT) and cybersecurity.

SCIENCE IN FRENCH

The profile and discoverability of science in French received a great deal of attention throughout the year. The first international francophone network on science advice (RFICS) was launched in Montréal on November 3, 2022, at a forum attended by more than 300 people. The event was held under the leadership of the Office of the Chief Scientist, the FRQ, and the Chief Science Advisor of Canada. As president of INGSA, Rémi Quirion announced the composition of the network's secretariat, to be housed at Université Laval and headed by Mathieu Ouimet. The RFICS is INGSA's first linguistic division. It also has branches in Africa and Europe, and its mission is to increase the capacity for science advice to governments in the francophone world. It is a means of building the francophone scientific diplomacy of tomorrow.



Reflections on science in French in Québec and around the world culminated in an international forum held in Montréal on April 26 and 27, 2023. This major event brought together specialists from the Americas, Europe and French-speaking Africa, who put forward different perspectives on the challenges faced by French-language science in terms of scientific output, knowledge dissemination, training and careers in research, supporting French-language scholarly journals, and the role of universities and the state in this regard. Participants from across the Francophonie identified promising avenues for action to better support and promote science in French – including plurilingualism, with

a view to promoting the world's major languages of science, and French in particular. Participants also concluded that granting agencies and universities should adopt policies or strategies to encourage the scientific and student community to publish their results in open-access French-language scientific journals.

In the lead-up to the forum, a survey of FRQ award holders provided an opportunity to assess their use of French in science, gather their views on science in French, and explore possible solutions for promoting science in French. The survey revealed, among other things, that almost half (48.5%) of respondents publish their research in English only,

whereas 92% recognize the importance of promoting the use of French in science.

This is the impetus behind the annual FRQ Publication en français awards competition, which is open to the scientific and student community across Québec and Canada. Presented on a monthly basis, these awards aim to promote and raise the profile of research publications in French, in all fields covered by the three Fonds de recherche du Québec. The Fonds Nature et technologies award is named after Gisèle Lamoureux, the Fonds Santé award is named after Alice Girard, and the Fonds Société et culture award is named after Louise Dandurand.

❖ Scientific missions and agreements

MISSIONS AS PRESIDENT OF INGSA

Québec's chief scientist visited Switzerland in October 2022 for a meeting with other members of the Foreign Ministries S&T Advice Network (FMSTAN). This international network of science advisors and diplomats aims to federate scientific diplomacy efforts worldwide. The event was held in conjunction with the GESDA (Geneva Science and Diplomacy Anticipator) summit and provided excellent visibility for Québec's research ecosystem.

In December 2022, Rémi Quirion travelled to South Africa for the World Science Forum, where he took part in a plenary session on the role of science in the fight against poverty, unemployment, inequality and exclusion. Among the topics discussed were the importance of contributing to the achievement of the United Nations Sustainable Development Goals and the need to promote the importance of scientific culture in the public sphere.

Continuing his international engagements, this time in Washington for the American Association for the Advancement of Science (AAAS) annual meeting in March 2023, Québec's chief scientist presented a working session on science advice to cities, organized by the FRQ and INGSA. Several activities and meetings were held in conjunction with this gathering. One of these concerned the setting up of a North American chapter of INGSA to address this very topic, and gave rise to fruitful discussions with the National Science Foundation (NSF), the National Institutes of Health (NIH), leaders of the AAAS and the City of Washington. Also in March 2023, Rémi Quirion spoke at the World Conference of Science Journalists (WCSJ) in Colombia. This event focused on science advice to elected officials and the general

public, highlighting the work of science journalists. The importance of ensuring a new generation of science journalists and developing links with the WCSJ, an international organization headquartered in Montréal, motivated this participation.

In May 2023, Rémi Quirion was invited to Paris for the mid-term meeting of the International Science Council (ISC), of which INGSA is a member. There he presented INGSA and its priorities for the coming year, including its next major international conference in Kigali, Rwanda in May 2024. This mission included several meetings and lively discussions on science advice, science in French, and the discoverability of French-language scientific content. A working meeting in London for the launch of a research program on the impacts of language and culture on science advice marked the first step towards the creation of INGSA's European chapter on the subject.

INTERNATIONAL SCIENTIFIC COLLABORATIONS

Autumn 2022 brought a wealth of engagements and collaborations with international partners. The United Nations Science Summit held in New York in September 2022 was an opportunity to address a number of themes: culture and science, the effectiveness of science advice, the role of granting bodies in achieving the UN's Sustainable Development Goals, and more.

• Agreement with Tunisia

In November 2022, Djerba, Tunisia hosted the summit of the Organisation internationale de la Francophonie (OIF). Rémi Quirion took part in the scientific component of this event, during which he signed a framework cooperation agreement between the FRQ and the Tunisian Ministry of Higher Education



Signing of a framework cooperation agreement between the FRQ and the Tunisian Ministry of Higher Education and Scientific Research (MESRS)

and Scientific Research (MESRS). The agreement aims to give new impetus to exchanges between the two parties and extend them to various sectors of scientific research. This is the second agreement signed with a French-speaking African country, after Morocco. Accompanied on this mission by Louise Poissant, Scientific Director of the Fonds de recherche du Québec – Société et culture (FRQSC), Rémi Quirion took part in two sessions at the summit, one on the discoverability of French-language content online and the other on societal challenges and issues related to scientific research in French. A discussion on science in French with Québec Premier François Legault and Minister of International Relations and Francophonie, Martine Biron, also proved to be productive.

- *Scientist in Residence program*

The Scientist in Residence program at Québec government offices abroad offers interesting career opportunities for the next generation of scientists. In partnership with the Ministère des Relations internationales et de la Francophonie and Les Offices jeunesse internationaux du Québec (LOJQ), the FRQ held a round of competitions in 2022-2023 for the Québec Trade Office in Silicon Valley, the Québec Office in Washington, and the Québec General Delegations in Tokyo, Munich and Brussels. A new competition is planned for 2023-2024.

- *Participation in COP15*

Montréal hosted the 15th Conference of the Parties to the United Nations Convention on Biological Diversity, COP15, in December 2022. Québec's chief scientist took part in a day-long event organized by Réseau Environnement. He presented the activities of his office, as well as FRQ programs related to biodiversity, climate change and health.



Rémi Quirion, Chief Scientist of Québec, in plenary session at the World Science Forum, South Africa, December 2022

❖ **Intersectoral project development**

SCIENTIFIC ENTREPRENEURSHIP

The FRQ continue to support V1 Studio and Front Row Venture in the rollout of their scientific entrepreneurship awareness programs. Support also continues for other projects, including the Québec Scientific Entrepreneurship Program (QcSE), L2M (Lab

to Market), Grad2VC, and the Innovators in Residence initiative, which offers student scholarships in practice settings related to scientific entrepreneurship in healthcare, in collaboration with numerous partners. In addition, the PERSÉIS space was launched in May 2023 in partnership with the Mouvement des accélérateurs d'innovation du Québec. Its aim is to contribute to the growth of intersectoral research in innovative entrepreneurship through the co-construction of knowledge, bringing together Québec's research community and its entrepreneurial ecosystem.

❖ **Conferences and public affairs**

PARTICIPATION IN ACFAS EVENTS

Acfas celebrated its centennial anniversary in 2022-2023, with a program of activities shaped by its rich heritage. The FRQ certainly didn't want to miss this big event! First, Rémi Quirion chaired the international committee for the Ma thèse en 180 secondes competition, which Acfas hosted in Montréal as part of the festivities. Four winners from diverse backgrounds were selected. The FRQ also co-presented the 10th edition of Journées de la relève en recherche, from October 26 to 29, 2022. The event was held in person for the first time since 2019, at Université du Québec à Trois-Rivières (UQTR). Nearly 200 graduate students and postdoctoral researchers from all regions of Québec and French-speaking Canada attended. The program included a 5 à 7 as well as three FRQ workshops (Scholarships, EDI, and Social Media) and three consultation sessions led by the Intersectoral Student Committee (CIE) on research in French, psychological health, and environmental responsibility in research practices.

A few months later, at the 90th Acfas Congress in May 2023, Québec's chief scientist presented the seminar *Villes, États et francophonie: la science à toutes les échelles du gouvernement*, which looked at how, despite their diverging interests, the scientific and political communities manage to pursue a common goal: to offer innovative, high-quality public services based on scientific information. The practical workshop on the social acceptability of using personal data in research and the Névada research-creation activity were also part of the activities organized by the FRQ.

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14TH CANADIAN SCIENCE POLICY CENTRE CONFERENCE (CSPC 2022)

Members of the Office of the Chief Scientist took part in the annual Canadian Science Policy Centre (CSPC) conference, which took place from November 16 to 18 in Ottawa, with seminars on cities, the student community, and science diplomacy.

LES ENTRETIENS JACQUES CARTIER SESSION AND A SUSTAINABLE HEALTH RESEARCH CHAIR

Rémi Quirion and Carole Jabet, Scientific Director of the Fonds de recherche du Québec – Santé (FRQS), took part in the symposium *La santé durable en tant que vecteur de progrès social et économique*, an event organized by the VITAM sustainable health research centre in collaboration with Les Entretiens Jacques Cartier, on November 29, 2022. This international event was an opportunity for exchange between the French-speaking scientific,

academic, cultural, economic and political ecosystems of France and Québec. A few months later, in January 2023, VITAM and the FRQS co-organized the Journée de la recherche en santé durable, during which the creation of a research chair in sustainable health was announced. The two co-holders of this chair are Jean-Pierre Després, professor at Université Laval and Scientific Director of VITAM, and Catherine Laprise, professor at Université du Québec à Chicoutimi and Director of the Centre intersectoriel en santé durable. The FRQS was thus able to fulfill one of the commitments made in its 2022-2025 strategic plan, namely to support research that is in tune with society and its diversity, for sustainable health, an essential resource for individual development and socioeconomic prosperity.



Launch of the research chair in sustainable health, January 24, 2023

ACCESS TO DATA FOR RESEARCH

The FRQ submitted a brief on February 7, 2023 as part of the special consultations and public hearings on Bill 3, *An Act respecting health and social services information and amending various legislative provisions*. Access to government data for research purposes has been an issue of concern to the FRQ for several years. An open letter published in *Le Devoir* on February 20, 2023, co-authored by Rémi Quirion, Chief Scientist of Québec, Mylène Deschênes, FRQ Director of Ethical and Legal Affairs, and Carole Jabet, Scientific Director of the FRQS, explains

that the key to success lies in a system of responsible health information mobilization that strikes a real balance between protection and efficient access, and that takes into account the secure ecosystem in which research activities are carried out. The letter proposes a new "social pact" for Quebecers regarding the use of their personal information for research purposes. It reiterates the importance of strengthening data governance in the healthcare network, and of providing an environment in which personal information for research purposes circulates in a modern, secure manner, beyond administrative silos.

ANNUAL GENERAL MEETINGS AND OTHER CONFERENCES

Québec's chief scientist participated in a number of annual general meetings during the 2022-2023 financial year, including that of PRIMA Québec, Québec's Advanced Materials Research and Innovation Hub. He also spoke at the 2023 symposium of the Association québécoise de pédagogie collégiale (AQPC), the 29th Conférence de Montréal, and the Societal Impact of Science Conference in Halifax.

Promoting research

A FORUM DEVOTED TO BASIC RESEARCH

The 8th edition of the FRQ/Palais des congrès de Montréal exchange forum, with its theme *GRANDEUR (et misère?) de la recherche fondamentale*, brought together some 70 people on November 24, 2022. Opened by Yves Gingras, historian and sociologist of science, the afternoon was an opportunity to take the pulse of several up-and-coming researchers and an established researcher – a way for the FRQ to mark the International Year of Basic Sciences for Sustainable Development. To conclude, attendees were treated to a skit in the form of a plea for basic research, performed by the event's host, Jean-Daniel Doucet, and his sidekick, Stéphanie Jolicœur, a physics and theater graduate.



LAUNCH OF THE REGARDS-SDG PROGRAM AND THE PROGRAM ON DISINFORMATION IN QUÉBEC

In November 2022, the FRQ launched the REGARDS-SDG program, inviting the student community to propose science communication projects in digital form (video, podcast, blog, etc.) with the goal of engaging and communicating with 18- to 30-year-olds about the United Nations Sustainable Development Goals (SDGs), in connection with the phenomenon of disinformation. Drawing on the pilot program Jeunes dans la lutte contre la COVID-19, conducted in 2020-2021 at the height of the health crisis, REGARDS-SDG aims to fight disinformation about SDGs, contribute to achieving the SDGs in Québec, and offer members of the student community practical experience in managing science communication projects.

In March 2023, the Research Program on Disinformation made its debut thanks to new budget appropriations under the QRIS². The results of the projects funded following the call for proposals should provide a better understanding of various aspects of the phenomenon of disinformation in the Québec context, identify possible solutions to mitigate disinformation, and mobilize practice and communication communities around research projects.

CP3-GAZELLE ET BÂTI/HR

The Public-Private Partnership Research Chairs in Innovation Zones (C3P-GAZELLE) program, which includes additional funding for human infrastructure (BÂTI/HR), was launched in November 2022. The two initiatives are part of the rollout of Québec's first two Innovation Zones (IZ) for quantum technologies and microelectronics. The establishment of these zones depends on interactions between stakeholders in research, innovation, industry and entrepreneurship. The Ministère de l'Économie, de l'Innovation et de l'Énergie (MEIE) has partnered with the Fonds de recherche du Québec – Nature et technologies (FRQNT) for this initiative.

SOCIAL MEDIA

Always very active on social media, Québec's chief scientist interacts regularly with his community. The number of subscribers to his accounts continues to grow: from 2022 to 2023, his Facebook, X (Twitter) and Instagram accounts saw increases of 7%, 12% and 31% respectively. All platforms combined, more than 50,000 people follow, comment on and share our content.



Science and government

SCIENCE ADVICE TO MUNICIPALITIES IS GAINING MOMENTUM

In May 2023, Québec's chief scientist was a speaker and panellist at a plenary session of the Union des municipalités du Québec (UMQ) annual general meeting, which focused on the potential of science advice for the municipal sector. Interest in this field is growing: Victoriaville and Longueuil have already taken initiatives in this regard in 2022-2023, with other cities to follow.

LAUNCH OF L'INTERFACE

In May 2023, Québec's chief scientist Rémi Quirion and Sophie Montreuil, Executive Director of Acfas, launched L'Interface, a unique training program for members of the research community who want to get involved with Québec's public administration or decision-makers. The program

ties in with the Forum sciences et politiques du Québec, an initiative of the Office of the Chief Scientist, and is part of the training offered by Acfas.

CLIMATE CHANGE TRAINING AT THE NATIONAL ASSEMBLY

The first climate change training session for Québec parliamentarians took place on April 18, 2023 at the National Assembly. Over 100 MNAs attended, including François Legault and several ministers. Alain Webster, Chairman of the Advisory Committee on Climate Change, Alain Bourque, Executive Director of the Ouranos consortium, and Rémi Quirion, Chief Scientist of Québec, presented the content. The second session, which will focus on concrete courses of action, is scheduled for November 2023.

INTERNATIONAL SYMPOSIUM: SCIENCE, POLITIQUE ET SOCIÉTÉ: QUELLE PLACE POUR L'INFORMATION SCIENTIFIQUE DANS LES PARLEMENTS?

The challenges of recent years have demonstrated the growing role of science in political decision-making and public policy development. Furthermore, in the face of disinformation, it is clear that the quality of information and the importance of disseminating it are becoming prerequisites for healthy democratic discussion. Parliamentarians from Québec and the Francophonie, along with members of the scientific community, came together at a symposium held on May 26, 2023, organized in partnership by the Québec National Assembly and the Chief Scientist. The aim of this event was to provide parliamentarians and their staff with tools for communicating and using scientific data in political debate and parliamentary work. It was a follow-up to the training session on climate change held in April 2023.



From left to right: Alain Webster, professor at the Université de Sherbrooke and chairman of the Québec government's Advisory Committee on Climate Change, Youba Sokona, vice-chairman of the Intergovernmental Panel on Climate Change (IPCC), Laure Waridel, ecosociologist and associate professor at the Institut des sciences de l'environnement de l'Université du Québec à Montréal (UQAM), Jean Lemire, biologist and climate change envoy for the Québec government, Rémi Quirion, Chief Scientist of Québec, Raed Hammoud, researcher and columnist - CBC/Radio-Canada



In conjunction with this initiative, the Climate Action scholarship program, a collaboration between the Advisory Committee on Climate Change and the FRQ, has been renewed for a second year (2023-2024).

Media presence

The Québec's chief scientist gave a number of media interviews over the course of 2022-2023. On 98.5 Montréal, he talked about scientific progress, COP15, the Sustainable Development Goals (SDG) and science in French, while on Radio-Canada Première, he discussed climate change training for elected members of the National Assembly, and the federal government's overall support for scientific research over the past decade. He was also interviewed on Télé-Québec's *L'avenir nous appartient*, and made a brief appearance on *Infoman*. Mario Dumont invited him to his show on QUB radio to talk about the forum *La science en français au Québec et dans le monde*. He was also consulted for a *La Presse* feature on the humanities and social sciences.



Jean-René Dufort, alias Infoman, with Rémi Quirion

scientifique-en-chef.gouv.qc.ca @SciChefQC

Fonds de recherche du Québec

500 Sherbrooke St. West, suite 800
Montréal (Québec) H3A 3C6
514 873-2114

140 Grande Allée East, 4th floor
Québec (Québec) G1R 5M8
418 643-8560 or 418 643-7582

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