

Fonds de recherche du Québec

Société et culture
Santé
Nature et technologies





POST-PANDEMIC RETROSPECTIVE FOR A BETTER FUTURE

In the fall of 2021, the light at the end of the tunnel seemed to be receding once again. The cause was Omicron, a new variant of COVID-19 that was beginning to spread across the province, threatening the resumption of work and social activities. The months that followed were not easy, punctuated by lockdowns, curfews and other restrictions. The main purpose of these measures was to slow down the exponential spread of this new and little-known variant.

However, it was not the time to stop research efforts. Across the globe, basic and applied science was steadily moving forward towards a common goal. On the one hand, research had intensified into the development of vaccines against the emerging new variants, and on the other hand, the transmission and replication mechanisms of these viruses were beginning to reveal their secrets.

These collective efforts have paid off. 2022 appears to be a new turning point in this global health crisis. With the help of science, humanity is getting closer every day to the possibility of "living with the virus".

Ah, science! It is more present than ever before, be it in the media, politics, or our social circles, inspiring trust for some and uncertainty for others. Long considered the purvey of the elite, science in all its aspects needs to be democratized and open to society. I am convinced of this, and through innovative initiatives and programs, we believe we can make it happen. By encouraging participatory science, open access to scholarly journals, dialogue with the general public, and the presence of scientists in the public and government space, we are fostering the establishment of a climate of trust and collaboration between science, society and government. The goal is to combat the scourge of disinformation, making way for a healthy democracy where exchange and freedom of expression become a valuable resource and a source of inspiration to meet the challenges of today and tomorrow, such as the climate emergency.

The year 2022 brings hope for many around the world. But it also brings its share of sad news: the heavy burden of war. As Chief scientist of Québec and president of the International Network for Government Science Advice (INGSA), I wish to express my support for the communities affected by the conflict in Ukraine. In order to assist the Ukrainian and Russian student and researcher communities, the FRQ have announced a series of exceptional measures to promote the values of openness and science diplomacy. I firmly believe that while war closes borders, science opens them.

A handwritten signature in black ink, appearing to read "Rémi Quirion".

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

Chief Scientist of Québec's Report 2021-2022

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CONTEXT

KEY ACHIEVEMENTS

For the third consecutive year, the activities of my office and those of the Fonds de recherche du Québec (FRQ) were shaped by successive waves of COVID-19 variants. Once again, in a show of resilience and adaptation, virtual mode proved extremely useful for honouring my national and international commitments. It was not until the spring of 2022 that I was able to gradually, and with great pleasure, resume my travel engagements and in-person activities. Thanks to science, we are now confidently looking to the future to meet the challenges of tomorrow.

While fulfilling my role as advisor to government authorities, particularly with regard to the management of the pandemic, I was delighted to begin my term as president of INGSA. For this first year, priority was given to the development of the 2022-2025 strategic plan and the creation of the Francophone Network on Science Advice, whose composition will be announced in November 2022. This Network will be a division of INGSA and will be based in Québec within a recognized higher education institution. Its activities will extend throughout the francophone world with branches in Europe and Africa.

2021-2022 can undoubtedly be considered a year of strategic planning, an essential step for post-epidemic economic recovery. Indeed, the key event this year was the launch of the new Québec research and innovation investment strategy (QRIIS 2022-2027). The QRIIS was developed based on extensive consultations and workshops, as well as a national forum. Over the next five years, a budget of \$7.5 billion will be allocated to research and innovation, including \$1.2 billion to the FRQ, to find innovative solutions to future challenges.

In line with the QRIIS, the FRQ have also drafted their 2022-2025 strategic plan. Our mission as a funding agency consists of promoting an environment conducive to discovery and the advancement of knowledge in order to contribute to the achievement of the UN's Sustainable Development Goals. To this end, we have planned several actions to support basic research, the essential foundation of the edifice of innovation. In addition, following UNESCO's recommendations, the FRQ have committed to the open science movement and have joined Coalition S to ensure greater equity in the immediate access to scientific publications arising from the funding they provide. In a francophone context, such equity can be fostered through linguistic diversity. We have therefore set ourselves the goal, for the years to come, of promoting science in French. This commitment translates into a set of measures such as support for French-language scholarly journals, awards, and, in the near future, holding an international forum on French-language science under Québec's leadership.



Activities related to the pandemic and the situation in Ukraine

SCIENCE ADVICE AND COVID-19

Since March 2020, the Chief scientist of Québec has continued to engage with various national and international decision-making bodies, particularly with respect to pandemic management. Frequent meetings with the Institut national de santé publique du Québec, the Director of Public Health, Canada's Chief Science Advisor, and other federal government experts have taken place in order to formulate science-based recommendations. This was an opportunity to discuss the various measures taken to manage the pandemic, such as vaccination approaches, but also to look to the future and develop post-pandemic strategies.

In addition, at the international level as president of INGSA, a number of actions and activities focusing on the pandemic were held. In September 2022, INGSA's Foreign Ministries Science & Technology Advice Network division held a meeting to discuss science diplomacy, represented by high-level science advisors to foreign diplomats from more than 35 countries.

INITIATIVES RELATED TO THE SITUATION IN UKRAINE

In response to the Chief scientist of Québec's desire to assist the Ukrainian and Russian student communities, the Fonds de recherche du Québec have developed a two-part support program for the coming year (2022-2023). The first component aims to extend the funding period for Ukrainian and Russian students, postdoctoral fellows and scientists who already hold an FRQ grant or scholarship and are present in Québec, and whose funding is coming to an end. The second component consists in offering host scholarships. The Chief scientist and the FRQ wish to support all Québec institutions willing to host master's, doctoral and postdoctoral students, or to offer research internships and training in practice settings for a period of two to six months, under this program.

Research directions

QUÉBEC RESEARCH AND INNOVATION INVESTMENT STRATEGY (QRIIS) AND FRQ STRATEGIC PLANNING

Nearly two years after work began, the Québec research and innovation investment strategy (QRIIS) was finally unveiled in May 2022. During 2021-2022, Rémi Quirion actively participated in numerous meetings and consultations with the teams from the Ministry of the Economy and Innovation and the Québec Innovation Council. More than 230 briefs were submitted by the scientific and student community, dissemination organizations, civil society, and the private sector.

The QRIIS embodies a new vision for the future: a bold and ambitious Québec that invests in research and sustainable and inclusive innovation to excel on a global scale and create greater economic and social wealth. More than \$7.5 billion will be invested over

the next five years, including \$1.2 billion through the FRQ, to provide Québec with a solid foundation in research and innovation. The QRIIS was launched at an event attended by more than 200 people in Montréal and a few hundred more in virtual mode, with presentations and discussions on various aspects of the new strategy, in which the Chief scientist of Québec took part.

In connection with the work on the QRIIS, the FRQ also developed their 2022-2025 strategic plans. Three key directions were defined for the coming years: attracting and retaining talent; promoting open and basic research; and research as a response to major societal challenges. The new strategic plans aim in particular to promote the principles of equity, diversity and inclusion (EDI), open science and open access to scientific journals, the Sustainable Development Goals (SDG), French-language science, and the link between science and policy in decision-making. As part of these efforts, a public service training session on access to scientific information was held in December 2021, with the participation of over 500 public servants.

The Chief scientist and his team are continuing their efforts to improve access to government health data, in collaboration with the Ministry of Health.

OPEN SCIENCE

The FRQ are committed to enabling public access to the knowledge produced as a result of their funding. By adhering to Plan S in 2021, they have undertaken to ensure open access, immediately and under an open license, to the scientific publications associated with the funding they provide.

These new requirements are intended to make science more effective, strengthen scientific collaboration, improve replicability, and combat disinformation. At the same time, the Chief scientist's office is developing training and internship programs to facilitate links between scientists and the public service. As part of these efforts, a public service training session on access to scientific information was held in December 2021, with the participation of over 500 public servants.

The Chief scientist and his team are continuing their efforts to improve access to government health data, in collaboration with the Ministry of Health.

FRENCH-LANGUAGE SCIENCE

The Chief scientist and the FRQ support French-language science through training awards, research grants and dissemination support. After the first year of the Prix Publication en français award program, the rules were revised to offer these awards to the entire scientific and student community of francophone Canada. These three monthly awards aim to give greater recognition to the scientific and student community and encourage them to publish in French. In order to take stock of the issue and better orient their actions, the Chief scientist and the FRQ are planning to hold a forum on French-language science in 2023.

Scientific missions and agreements

MISSIONS AS PRESIDENT OF INGSA

The Chief scientist of Québec travelled to Brussels in May 2022 to participate in workshops with sub-committees of the European Commission, and to Paris to chair a committee for the French government on future investments in priority sectors and to meet with leaders of the Assemblée des parlementaires de la Francophonie.

In addition, Rémi Quirion took part in a mission to Rwanda in May 2022 as president of INGSA and at the invitation of the Assemblée des parlementaires de la Francophonie. Meetings with senior Rwandan government officials were on the agenda, as well as with the leadership of the University of Rwanda. During these meetings, the relocation of INGSA's Africa chapter to Rwanda and possible partnerships with Québec were discussed. During the year, Rémi Quirion attended two board meetings as a member of the Board of Governors of the University of Rwanda.

Under the European chapter of INGSA, he took part in the EuroScience Open Forum in Leiden, Netherlands, organized by the International Research Council from July 13 to 16, 2022, during which he participated in various activities. The theme of the forum was Crossing Borders, Engaged Science, Resilient Societies.

INTERNATIONAL SCIENTIFIC COLLABORATIONS

• Agreement with France

In February 2022, Québec premier François Legault and French prime minister Jean Castex announced the creation of a France-Québec research chair on contemporary issues of freedom of expression. The Ministry of International Relations and La Francophonie mandated the FRQ with implementing the Québec component of the Chair, while the French Ministry of Higher Education, Research and Innovation gave this mandate to the Conseil national de recherche scientifique for the French component. Through this initiative, the FRQ hope to respond to the need for knowledge in the field of freedom of expression and stimulate scientific collaboration between Québec and France and, more broadly, on an international scale.

• Agreement with Israel

In March 2022, as part of a mission by Québec's Ministry of the Economy and Innovation, the Chief scientist, as a representative of the Fonds de recherche du Québec – Santé, and Israel's Ministry of Innovation, Science and Technology signed a three-year partnership agreement to support joint research projects in the field of artificial intelligence in health care. This agreement follows a 2016 agreement on biomedical imaging, which gave rise to three joint research projects. It was made possible by more than \$20 million in funding from the Québec's Ministry of the Economy and Innovation.



Abraham (Avi) J. Domb (Chief Scientist, Ministry of Science and Technology of Israel), Rémi Quirion (Chief Scientist of Québec), Hilla Hadad (Director General, Ministry of Innovation, Science and Technology of Israel) and Pierre Fitzgibbon (Quebec's Minister of the Economy and Innovation)

• Agreement with Morocco

As part of a mission to Rabat in June 2022 to meet with several senior government officials and university presidents, the Chief scientist, Morocco's Ministry of Higher Education, Scientific Research and Innovation, and the National Center for Scientific and Technical Research signed a three-year renewable scientific collaboration agreement with a budget of \$1.35 million from Québec and 9 million dirhams from Morocco. This partnership aims to encourage collaboration in common areas of interest such as artificial intelligence, agriculture, health, renewable energy, social sciences and humanities.



Jamila El Alami (Director of the National Center for Scientific and Technical Research of Morocco) and Rémi Quirion (Chief Scientist of Québec)

LA FRANCOPHONIE

Since taking office, Rémi Quirion has always advocated for collaboration to ensure a democratic life enriched by quality scientific expertise available in French. In recognition



Rémi Quirion (Chief Scientist of Québec), Ricardo Trog (Filmmaker), François Paradis (President of the National Assembly of Québec) et Isabelle Hudon (President of the Business Development Bank of Canada)

• Agreement with the Agence Universitaire de la Francophonie (AUF)

of his efforts, he was awarded the Ordre de la Pléiade by François Paradis, president of the National Assembly of Québec, on May 17, 2022. This "Ordre de la Francophonie et du dialogue des cultures" recognizes the merits of public figures from different fields, but united by their interest in La Francophonie and its values.

• Collaboration with the Université de l'Ontario français (UOF)

In February 2022, Rémi Quirion was invited by UOF and its Hub of Knowledge and Innovation to describe his role in the Canadian and international Francophonie. This meeting was a chance to discuss the various opportunities for collaboration and exchange of expertise in order to strengthen ties between Québec and Ontario.

❖ Intersectoral project development

INTERSECTORAL RESEARCH ON AGING (3RD COMPETITION)

The pandemic crisis has highlighted the need to redouble our research efforts in all sectors to protect the lives of our most vulnerable seniors and to respond more adequately to their needs. To this end, the Chief scientist of Québec announced on September 17, 2021 the launch of the third competition of the Platform of Funding Programs for Intersectoral Research on Aging, with two components. The first component, Living Lab – Regions, is designed to act as an incubator that will foster the emergence of new intersectoral approaches through the involvement of stakeholders working in the regions. The second component, Support for Scientific Entrepreneurship, aims to encourage collaboration between university scientists and scientists in companies, increasing research capacity for the joint creation of new knowledge and solutions. In June 2022, the FRQ announced the creation of three Living

Labs in the regions and a project linking the scientific and entrepreneurial communities, for a total of approximately \$850,000.

NEW SUPPORT PROGRAM FOR SCIENTIFIC ENTREPRENEURSHIP

On May 12, 2022, the Chief scientist of Québec announced the launch of the Support for Scientific Entrepreneurship program. This initiative aims to encourage collaboration between university scientists and other scientists in companies, thereby increasing research capacity for the joint creation of new knowledge and innovative solutions addressing two major challenges: the aging population, and climate change and decarbonization. Each grant is worth \$100,000 to \$125,000.

CNRST-FRQ RESEARCH COLLABORATION PROGRAM

Morocco's National Center for Scientific and Technical Research (CNRST) and the FRQ an-

nounced in May 2022 the launch of a call for projects for collaborations involving researchers from Morocco and Québec. The objective of this call is to stimulate research related to major societal challenges that has a diversified, interdisciplinary and intersectoral approach and a strong potential to strengthen skills and develop innovative and sustainable solutions. Two themes were selected for this first call for projects: health sciences and climate change adaptation. Funding consists of a grant of up to \$225,000 or 1,500,000 dirhams per project for three years.

SUPPORT FOR THE GOVERNMENT ACTION PLAN FOR THE SOCIAL AND CULTURAL WELLNESS OF THE FIRST NATIONS AND INUIT

On June 22, 2022, the Chief scientist of Québec, Rémi Quirion, and the Fonds de recherche du Québec announced their support for the 2022-2027 Government

Action Plan for the social and cultural wellness of the First nations and Inuit. One of the key measures of this action plan concerns the introduction of direct support for Indigenous students planning to pursue higher education. The program is expected to be launched in 2023. However, as of this year, research in an Indigenous context will receive \$1 million in funding per year for five years, in the form of calls for research projects, Living Labs and merit scholarships.

LAUNCH OF NEW DOCTORAL SCHOLARSHIPS TO FUND CLIMATE CHANGE RESEARCH

In August 2022, the FRQ and the Advisory Committee on Climate Change announced the launch of a new Climate Action Scholarship program. Up to 10 scholarships of \$12,000 each will be awarded each year. Intended for doctoral students whose work is related to climate change, the initiative aims to support the acquisition of new scientific knowledge and skills related to climate

issues, foster the emergence of a new generation of professionals in the field of applied research, and support the Committee in fulfilling its mandate.

SCIENTISTS IN RESIDENCE

In 2022, the Chief scientist, in collaboration with the Ministry of International Relations and La Francophonie, re-launched the competition for scientists in residence at Québec government offices abroad, which aims to promote science diplomacy, contribute to positioning Québec at the international level, and build ties between the Québec university network and that of the host country. After a first competition that filled positions in Paris (UNESCO), Rabat and Seoul, this second competition offers positions in Tokyo, Munich, Brussels, Washington, and Silicon Valley for the first quarter of 2023.

❖ Conferences and public affairs

PARTICIPATION IN TWO ACFAS EVENTS

Co-presented by the FRQ, the 9th edition of the Journées de la relève en recherche took place from October 25 to November 1, 2021, exclusively in virtual format. This conference was entirely dedicated to the professional development of graduate research students. Master's and doctoral students and postdoctoral fellows from all regions of Québec and francophone Canada took part in some twenty training, discussion and networking activities. The program included a variety of activities: an opening round table featuring inspiring PhD students, more than 15 diverse workshops given by highly qualified scientists and specialists, talks on topics of direct interest to the emerging generation of researchers, and a virtual networking activity with the Chief scientist and his team.

Earlier, in May 2021, the Chief scientist participated in a few seminars on participatory science and intersectoral research as part of the 88th Acfas Congress, which was held exclusively in virtual mode. Every year, he makes it a point to participate in this event, the largest French-language scientific conference in the world.

13TH CANADIAN SCIENCE POLICY CENTRE CONFERENCE (CSPC 2021)

The involvement of the FRQ and the Chief scientist in the annual Canadian Science Policy Center (CSPC) conference, which is attended by more than 700 Canadian actors in research and innovation policy, helps strengthen ties between all regions of Canada by bringing together actors from francophone and anglophone communities around emerging issues in the field of science policy. In November 2021, the FRQ organized

several workshops at CSPC 2021. Discussions focused on women as leaders of granting councils, agri-food in Québec and Canada, and science advice at the municipal level. In addition, the Chief scientist participated in a session on disinformation and its impacts on science in Québec and around the world.

ONE-DAY RESEARCH EVENT ON BIO-FOOD AND SUSTAINABLE AGRICULTURE

On November 11, 2021, a hybrid event entitled *L'agroalimentaire du futur: IA, agriculture durable et innovation en recherche* took place at the Québec City Convention Centre. The event gave rise to excellent presentations and fruitful exchanges. The Chief scientist of Québec, the Minister of Agriculture, Fisheries and Food André Lamontagne, and the Minister of the Economy and Innovation Pierre Fitzgibbon spoke at the beginning of the session. Moderated by FRQNT scientific director Janice Bailey, the event was an opportunity to present the new Réseau québécois de recherche en agriculture durable and the research projects of the Impulsion program (Agriculture component), and to discuss the launch of a white paper on the value of digital data in the bio-food industry produced by the International Observatory on the Societal Impacts of AI and Digital Technologies (OB-VIA), the AI observatory funded by the FRQ.

LE GRAND RENDEZ-VOUS DE L'INNOVATION QUÉBÉCOISE

On November 18 and 19, 2021, a hybrid version of Le Grand rendez-vous de l'innovation Québécoise was held in Montreal, reaching 2,600 people (including 250 in-person attendees). The first day included speeches by the Québec Premier and the five minis-

ters present, and a few discussions including one organized by the Chief scientist on the impact of basic research. On November 19, nine thematic forums were held in virtual mode, including an academic research community forum organized by the FRQ. The FRQ forum was structured around five workshops attended by about one hundred people on the themes of sustainable health, cultural research, NSE research for a sustainable Québec, major societal challenges and intersectorality, scientific literacy and disinformation.



Rémi Quirion (Chief Scientist of Québec), Julie-Maude Normandin (Co-director, Research and Communications of the Cité-ID Living Lab), Mehrdad Hariri (President of CSPC), Nancy Déziel (Director General of CNETE), Maxime Pedneault-Jobin (Former Gatineau mayor) and Brooke Struck (Research Director, The Decision Lab)

FORUM TO BETTER EQUIP THE SCIENTIFIC AND JOURNALISTIC COMMUNITY

The 7th FRQ/Palais des congrès de Montréal Forum entitled *Parler de science dans l'espace public: facile?* Took place in Montreal on December 9, 2021. The forum was held in a hybrid format (75 in-person attendees and more than 260 in virtual mode). Moderated by science journalist Binh An Vu Van, the forum's objective

was to equip members of the scientific community, as well as science communicators and students, to deal with the phenomenon of disinformation. This initiative is one of a series of events organized by the FRQ or in which they participated this year on the theme of disinformation, including the participation of the Chief scientist in a panel on the subject, organized by LaScienteAbord on November 30, 2021.



Promoting research

RESUMPTION OF BREAKFASTS AT THE QUÉBEC NATIONAL ASSEMBLY

The Chief scientist organizes regular science breakfasts with MNAs, chiefs of staff and deputy ministers at the Québec National Assembly, with the goal of presenting them with the expertise of Québec's many researchers that they can use to make informed decisions. The event had been put on hold because of the pandemic. In May 2022, Rémi Quirion invited the members of the National Assembly to the 14th edition of the science breakfasts, with the theme of *How are our children doing after two years of the pandemic?* Nearly thirty people, including 15 elected officials, came to discuss the work of the Observatory on Children's Education and Health with researchers Sylvana Côté of Université de Montréal and Catherine Haeck of UQAM.

LAUNCH OF THE THIRD EDITION OF THE ENGAGE PROGRAM

The 3rd edition of the ENGAGE program was announced in August 2022. This program invites citizens to engage in a scientific process that addresses a question of interest to them. This citizen-scientist collaboration supports the development of new participatory science practices and promotes a culture of democratization of scientific knowledge within Québec society. The program includes a Startup phase, which allows citizens to propose a scientific question and team up with a researcher, and an Action phase, which consists of implementing the project they created together.

ENHANCEMENT OF THE DIALOGUE PROGRAM (2022-2023)

In a context of disinformation, it is important to encourage the research community to interact with the general public about their work. With this program, the Chief scientist of Québec is seeking to establish a dialogue between the scientific community and the public. For a fourth year, the FRQ are re-launching and improving the DIALOGUE program by increasing the number of grants offered to researchers (from six to nine) and the number of scholarships offered to students (from 12 to 18).

SOCIAL MEDIA

The Chief scientist of Québec is very active on social media and interacts regularly with his community. The number of subscribers to the various accounts is constantly growing. From 2021 to 2022, his Facebook, Twitter and Instagram accounts have seen about a 20% increase in subscribers.

Media presence

The Chief scientist of Québec made several general public media appearances during 2021-2022. Media such as Radio-Canada, TV5MONDE, and 98.5 Montréal invited him to speak on the evolution of the COVID-19 pandemic. Aspects such as the management of the health crisis and disinformation were addressed and debated. He also took part in a special program on the digital transformation with Québec Chief innovator Luc Sirois, to discuss the topics of artificial intelligence and open access to data. In relation to his new mandate as president of INGSA, he also spoke about science advice, science-informed policy, and the future launch of the francophone science network..



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