

News Release

The mathematical and statistical sciences are essential to discovery and innovation, report finds

Solutions for a Complex Age: Long Range Plan for Mathematical and Statistical Sciences Research in Canada 2013–2018 was released on December 8, 2012, at the Winter Meeting of the Canadian Mathematical Society. The plan sets out a vision for global excellence in research, building on three pillars: **People; Research and Discovery; Innovation and Connections.**

In 2010, NSERC requested the Canadian mathematical and statistical sciences communities undertake a comprehensive long range planning exercise, with the aim of establishing a unified vision of priorities and directions for the development of research in the mathematical and statistical sciences in Canada. A Long Range Plan Steering Committee of leading mathematical and statistical scientists was established to guide the process. The plan follows more than two years of work and extensive consultations, and reflects the dynamism, strength and diversity of aspirations of the different segments of the mathematical and statistical sciences research communities in Canada.

“The aptly titled plan acknowledges that we live in a knowledge-based society that requires collaborations across disciplines, sectors and nations”, said Suzanne Fortier, President of the Natural Sciences and Engineering Research Council of Canada (NSERC). *“Fundamentally sound and forward looking, this plan provides us with a great foundation to situate mathematics and statistics in a research and innovation world without borders.”*

“Our researchers are passionate about their work, deeply committed to pushing forward the boundaries of their science and keenly interested in contributing to the innovation agenda,” said Nancy Reid, Chair of the Steering Committee. *“The plan emphasizes that achieving our communities’ vision will require a strong commitment to continued investment in mathematical and statistical sciences research, and a willingness to find new ways to collaborate with Canada’s research community and funders.”*

Key recommendations to NSERC

- Invest in Canada’s mathematical and statistical sciences research via Discovery Grant levels that reflect the importance of the research base to Canada, and that acknowledge that the costs of research are similar to those in several related science and engineering disciplines.
- Invest in Canada’s network of thematic and collaborative resources in the mathematical and statistical sciences, including the newly developing Canadian Statistical Sciences Institute, and ensure that the funding envelope has a boundary between Discovery Grant funding and funding for these resources, to enable both to flourish and support each other.

- Augment the funding envelope to include the Research Partnerships Portfolio, enabling the mathematical and statistical research communities—working through the institutes and through Mprime—to provide a platform for a wide range of successful partnerships between the mathematical and statistical sciences and industrial partners.
- Establish a committee of leading mathematical and statistical scientists, chosen in consultation with the research communities, to oversee the implementation of this Long Range Plan, represent the research communities to NSERC, and develop research linkages among the mathematical and statistical sciences and allied science disciplines.

Highlights from the report

Canada aims to be a top global performer of science, technology and innovation, and a strong capacity in mathematics and statistics research is central to achieving this goal. The power of the mathematical and statistical sciences lies in part in their ability to supply a common structure and language to science and technology. They are fundamental to the scientific method, facilitating interdisciplinary collaboration and the translation of discovery into innovation.

Canada’s researchers in the mathematical and statistical sciences have the expertise, drive and momentum to bring real innovation to the most challenging and complex problems of importance to Canada and the world. Researchers in mathematics and statistics are at the forefront of integrating mathematical and statistical expertise into interdisciplinary teams, as reported by the Council of Canadian Academies in *The State of Science and Technology in Canada, 2012*.

The Long Range Plan identifies synergies with several strategic growth areas: the oncoming “data tsunami”, image analysis, quantum information, new materials, sustainability, financial mathematics and mathematical biology. It also emphasizes the importance of maintaining breadth, depth and diversity in mathematical and statistical research. Advances in one area of research often, but unpredictably, lead to advances in completely unrelated areas of research, in new modes of training and in technological innovation. The Mathematics of Planet Earth, and the International Year of Statistics, both special initiatives for 2013, reflect global concern with the role of mathematical and statistical thinking in complex problems.

The mathematical and statistical sciences foster abstract thinking, and empower people to apply creativity to advantage. Graduates with strong training in mathematics and statistics can be found using their analytical skills in industry, government and academia. They are making a difference across sectors as diverse as physics, biology, information and communications technologies, aerospace, finance, manufacturing, agriculture, oil and gas, mining, forestry, ecosystem management, population health, and medical diagnostics and treatments.

The plan calls on researchers to build on their expertise and to bring the mathematical and statistical sciences to the fore in finding solutions to issues that

really matter to Canadians and to the world — from energy to security to environment to health care.

The Long Range Plan calls for continued investment in thematic and collaborative resources, including the newly developed Canadian Institute for Statistical Sciences. It also calls for new investment in research partnerships in the mathematical and statistical sciences, to ensure an ongoing and wide-ranging collaboration with industry that strengthens Canada's capacity for innovation.

Background to the report

The Natural Sciences and Engineering Research Council supports individual researchers in the mathematical and statistical sciences in Canada through its Discovery Grants program. Canada's researchers in mathematics and statistics are highly ranked in the recent Council of Canadian Academies (CCA) report on the state of science and technology in Canada; 9th in the world in Average Relative Citations and 5th in the world on reputation. Research in mathematics and statistics spans a broad range of activity, from foundational studies of the principles of mathematics and statistics, through areas as diverse as quantum computing, climate modelling, analysis of risk, medicine and public health, sustainability and many more. Research advances in foundations often lead to surprising and important practical advances.

NSERC also provides funding for major thematic and collaborative resources: the Centre de recherches mathématiques, the Fields Institute for Research in Mathematical Sciences, the Pacific Institute for the Mathematical Sciences and the Banff International Research Station for Mathematical Innovation and Discovery. These resources provide opportunities for innovation and research collaboration involving groups of researchers from across Canada and around the world. From 1998 through 2012, the Mathematics of Information Technology and Complex Systems (Mitacs) Network of Centres of Excellence, renamed Mprime in 2011, took a defining leadership role in academic-industry interactions, in training the next generation of researchers and in opening channels for technology transfer.

For more information

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