

Long Range Plan 2012 Mathematics and Statistics

Presentation to departments
winter 2011

longrangeplan.ca




Steering Committee

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- **Membership:**
 - Alejandro Adem, Ed Bierstone, Eddy Campbell, Charmaine Dean, Christian Genest, Gail Ivanoff, Niky Kamran, Rachel Kuske, Mark Lewis, Nancy Reid, Anne-Marie Thompson
- **Representation:**
 - Statistics, Pure mathematics, Applied mathematics, Institutes, NSERC (ex-officio)
- **“Pre-steering” committee:**
 - NSERC Math-Stats Liaison + Presidents + Institute Directors
 - Summer 2010, recommended size, chair, etc.



Timeline

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- Call for nominations for steering committee: August, 2010
- Establishment of steering committee: summer, 2010
- First meeting of SC, announcements: October, Nov 2010
- Call for discussion papers: January, 2011
- Data collection, committee meetings: January - March 2011
- Rough outline, main tasks assigned: April, 2011
- Detailed outline: June, 2011
- Town halls: Fall? 2011
- **Final report: January, 2012**



Why a Long range Plan?

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- Important changes in funding for mathematical and statistical sciences, including changes to the Major Resources Support (MRS) program where the Institutes and BIRS are currently funded
- NSERC has asked us to provide a plan outlining how to respond to these changes
- Explore alternatives to the current model for NSERC support of mathematical and statistical sciences research
- MITACS NCE ends in 2012



How will the plan be used?

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- NSERC is considering a single envelope of funding for mathematical sciences
- Provide advice on the structure of an envelope, or alternatives, with oversight of the funding, with ability to respond to innovation
 - Does not supersede merit-based assessment of grant applications by evaluation group members
 - Is not prescriptive in terms of scientific areas to be supported
- Opportunity to showcase statistical and mathematical sciences in Canada; raising the profile and potential of mathematics and statistics in the broader context.



Context for long range plan

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- 5 year plan with view to longer term horizon
- Mathematical sciences leadership retreat, fall 2009
- Re-allocations exercise, 1994—2007 now terminated
- Council of Canadian Academies review of performance metrics will be used by NSERC to guide allocations to disciplines
- Changes to structure of Discovery Grant peer review process
- International reviews
- Funding available from NSERC has not changed significantly in recent years



How will the plan be written?

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- A writing sub-committee will be established to prepare the draft and then the final document.
- Discussion documents solicited from the community will inform the plan. Feedback will be used to build the plan.
- The societies and institutes will also submit discussion documents.



Terms of reference

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- Current and future scientific context;
- How best to support the present programs of research;
- The role of the Mathematical Institutes and BIRS as community resources;
- Identification of important new initiatives and directions;
- How best to incorporate new initiatives into the research agenda;
- How best to leverage other research resources.



Terms of reference

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- **Current and future scientific context;**
 - How are current scientific developments affecting research in mathematics and statistics
 - How is research in mathematics and statistics impacting science
 - How does/should research in mathematics and statistics contribute to national science policy discussions



Terms of reference

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- Current and future scientific context;
- **How best to support the present programs of research;**
 - How does existing infrastructure support research and training in mathematics and statistics
 - Are there opportunities for different mechanisms that would strengthen the support of research, for example, to facilitate greater collaboration
 - Are there important areas of research that are 'falling between the cracks', in terms of NSERC funding
 - Recognizing that adequate funding continues to be a struggle, is the current mix of resources suitable for research goals in mathematics and statistics



Terms of reference

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- Current and future scientific context;
- How best to support the present programs of research;
- **The role of the Mathematical Institutes and BIRS as community resources;**
 - How do current programs at the institutes impact research, training and recruitment in mathematics and statistics
 - What types of Institute initiatives might enhance their impact on research in mathematics and statistics



Terms of reference

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- Current and future scientific context;
- How best to support the present programs of research;
- The role of the Mathematical Institutes and BIRS as community resources;
- **Identification of important new initiatives and directions;**
- **How best to incorporate new initiatives into the research agenda;**
- **How best to leverage other research resources.**



Activity, Fall 2010

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- **October 31, first in-person meeting, Toronto**
 - Agenda: timelines and work flow, general discussion of vision, hurdles, data collection, engaging the community
- **Regular conference calls**
- **Meetings with:**
 - CMS executive
 - Math chairs
 - Stats chairs
 - SSC executive
- **International advisory committee:**
 - Mark Green, Jim Berger, Jean-Pierre Bourguignon



Activity, winter 2011

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- **January 29-30, committee meeting in Montreal**
 - Agenda: submissions from institutes, international activity, community consultations, draft chapter headings
- **Regular conference calls**
- **Steering committee members visiting a number of their local universities, Feb-Mar 2011**
- [Call for submission of discussion documents](#)



Community Input

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- [Call for submission of discussion documents](#)
- **Discussion papers also solicited from**
 - CMS, CAIMS, SSC
 - Institutes
 - MITACS
 - Advisory Groups
- **University consultations**
- **Town Hall Meetings – fall, 2011**
- **Presentations at society meetings – May, June, July, 2011**



[For example](#)

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Would it be helpful to researchers if NSERC's Team Grants and/or USRA programs were less restrictive?

Do we need special efforts for cross-disciplinary research areas, in the absence of the old "inter-disc" GSC?

How can the institutes best support research in mathematical and statistical sciences?

Can the institutes play an active role in funding researchers at small and isolated universities?

How will end of NCE funding to MITACS impact researchers?

Should math/stats make more use of NSERC's Research Partnerships Programs?

How can the math/stats communities influence research funding at the policy level?



The call for discussion documents

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• *Science*

- What are some highlights of science in your research area and broad discipline?
- What changes do you see occurring, and do you expect to occur in the scientific landscape, over the next five to ten years,?
- What opportunities do you see for advancing your science, over the next five to ten years?
- What is the importance to your area of cross-disciplinary work? What is the scope of collaboration: within the area, within related areas of mathematical sciences, within science, ... ?
- Are there barriers at granting agencies that limit your ability to engage in interdisciplinary research?



The call for discussion documents

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• *Research funding*

- How does existing research infrastructure help your research and training?
- What additional types of infrastructure are needed, and to what extent are these available in Canada?
- What activities do you foresee over the next five to ten years having most impact on research in your area?
- What types of research opportunities for your field would enhance the research potential?
- Are there research areas that are 'falling between the cracks' in terms of funding opportunities?



The call for discussion documents

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• *Institutes*

- One element of the plan is to examine the role of the mathematics institutes, including BIRS, as community resources
- What current institute activities are most relevant for your area, and more broadly?
- Are there new activities that would best fit at an institute, that you feel would be beneficial for research and training?
- What role do institutes currently play in training HQP in your area?
- What is your assessment of the long-term impact of the institutes on research areas with which you are familiar?



The call for discussion documents

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• *Training*

- What structures are needed to support training in your area and more broadly?
- Are structures needed to expand the pipeline of advanced trainees?
- If so, what types of resources would be the most effective for this?



The call for discussion documents

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- **International**
 - What types of research support is available to your international colleagues, that could benefit research in Canada?
 - Would it be advisable to fund these types of programs in preference to currently available programs?
 - What types of structures would support international collaboration
 - Is international funding available in your area?; are there structures that could enhance your ability to obtain international funding



What are we missing?

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- Contribute to discussion via web page
 - “Contact us” link at bottom right
- Send email to steering committee via any member
 - List of members with contacts on web page
- Contribute a discussion document
- Talk to your colleagues
- Attend presentations of the LRP Steering Committee



FAQ

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- **What about the Mathematics & Statistics - NSERC Liaison committee?**
 - This committee continues to exist, and to interact with NSERC.
 - The Liaison committee’s role is to address current operational issues; the LRP’s role is to work towards the longer term.
- **Why are mathematics and statistics being lumped together?**
 - Within the new structure at NSERC, mathematics and statistics are evaluated by one Evaluation Group.
 - Note that the reviews in both the UK and the US currently underway also include statistics and mathematics.




... FAQ

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How can we get more funding?

NSERC has asked the Council of Canadian Academies to prepare a report on performance indicators. This report will be used to inform potential re-allocation of funds across evaluation groups.

The expert panel is chaired by Rita Colwell: see <http://www.scienceadvice.ca/en/assessments/in-progress/science-performance/expert-panel.aspx>




Follow the Money

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Institutes (PIMS, Fields, CRM)	-- 3.5 m	16%
Birs	0.6 m	3%
Discovery Grants	17.5 m	81%

[2009](#) (Table 43):
 Average Grant, Mathematics and Statistics – \$18,116
 966 grant holders
 $3.5\text{m}/966 = \$3,600$



2010 Competition

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Evaluation Group	Average	Success Rate
Genes Cells and Molecules	33,610	52.2%
Biological Systems and Fns	38,985	51.4%
Evolution and Ecology	32,978	60.2%
Chemistry	55,092	53.8%
Physics	40,828	62.3%
Geosciences	30,245	54.3%
Computer Science	27,044	64.2%
Mathematics and Statistics	19,656	62.1%
Civil, Industrial, Systems	30,131	52.5%
Electrical, Computer	30,401	63.3%
Materials, Chem	32,271	66.5%
Mechanical	27,199	63.7%