



May 15, 2011

Submission to Long Range Planning Committee
for NSERC Mathematics and Statistics Evaluation Group

As a department of mathematics and statistics we are representative of many areas in the long range plan, including pure and applied mathematics and statistics. This letter speaks to two broad issues related to the long range plan: Discovery Grants (DGs) and the impact of Mathematics Institutes on Acadia researchers in the mathematical sciences.

Acadia University is a primarily undergraduate institution, although our department has had an active MSc program since 2005. Thus HQP at a variety of levels are an important element of the research programs of members of our department. Of note is our honours undergraduate program, in which students write an honours thesis that quite often includes novel research that is disseminated at conferences, workshops and in peer-reviewed journals. For a department of our size, we produce an unusually high yield of students who advance to graduate level research in the mathematical sciences. This emphasis on top-quality undergraduate research is further underscored by the Atlantic Electronic Journal of Mathematics, a new peer-reviewed journal focusing on student research, founded and edited by faculty members Franklin Mendivil and Holger Teismann.

An August 27, 2010 letter to NSERC president, Suzanne Fortier, from Ray Ivany, Tom Herman and David MacKinnon (Acadia's President, VP Academic, and Acting Dean of Research and Graduate Studies) very effectively makes the point that undergraduate research has a very significant impact on subsequent graduate training of HQP:

“Small universities like Acadia provide an outstanding training ground for future researchers. In April 2009, Dr. Alain Beaudet, President of CIHR, spent a day at Acadia. [...] He noted that he has long known that we “capture” future scholars and researchers by their third year of undergraduate study. There is no better way to do this than in a vibrant thesis-based Honours program that immerses first-time student researchers in an environment that provides one-on-one supervision by active faculty researchers. This is the great strength of small universities.”

With our emphasis on undergraduate research, a significant concern in our department is that such research be recognized as relevant training of HQP by NSERC discovery grant evaluation groups. Although undergraduate research itself is funded (at least partially) by programs such as NSERC USRAs, the NSERC Discovery Grant remains a cornerstone of such a research activity, providing matching support for students and basic research funding for supervising faculty. (In fact, NSERC has created a “catch-22” situation by restricting supervision of USRA students to Discovery Grant holders.) As an institution, Acadia has seen varied and sometimes quite poor outcomes in recent

discovery grant competitions, with institutional success rates ranging from 15% to 50%. These are considerably lower than Acadia's historical rates. Given NSERC's emphasis on HQP in the evaluation of discovery grants, a key concern of mathematical scientists at Acadia is that research that actively involves undergraduates be recognized as HQP training. Anecdotal evidence suggests that it is very difficult for NSERC applicants from smaller universities such as Acadia to score higher than Moderate in the HQP category. Making up such a score in the other two categories is increasingly difficult, putting applicants from smaller universities at an unfair disadvantage, and in fact hurting HQP training in significant ways.

We stress that NSERC is not the sole source of funding, but that without this key support, research programs at Acadia will struggle to continue. Indeed, some members of our department with more applied programs have successfully leveraged partnership programs, such as MITACS and NICDS internships to fund HQP research. NSERC remains the only funding program that supports research in all areas of the mathematical sciences, however.

Research at Acadia does not solely involve HQP at the undergraduate levels. Our MSc program is active, faculty co-supervise doctoral candidates at other institutions, and we have had five post-doctoral fellows since 2005.

Although much of the above commentary on research involving HQP is applicable to all of Acadia, and not just the mathematical sciences, it is especially relevant in this area. In the mathematical sciences, HQP support constitutes a larger portion of Discovery Grant funding. The actual funding levels are quite low in comparison to other disciplines. In fact, the mathematical sciences have been seriously underfunded for quite some time and the high ratio of HQP funding in the DG envelope has made mathematical sciences an excellent "deal" for NSERC.

We comment briefly on the impact of the mathematics institutes on Acadia researchers. The greatest impact is through AARMS. Our department has benefited from AARMS funding of research workshops at our institution and at other Atlantic Canada locations, and from AARMS postdoctoral fellowships. Since a key component of AARMS funding flows from Fields, CRM and PIMS (and thus NSERC), we would argue that continued funding of the institutes by NSERC is beneficial to research at Acadia. However, while BIRS, Fields, CRM and PIMS provide world-class programs, Acadia's location prevents sustained involvement in their activities. Activity at these four institutes is not of significant benefit to mathematical scientists at Acadia.

In summary, the following recent trends in NSERC's funding priorities and policies are particularly worrying to researchers in the mathematical sciences at smaller universities.

- the "flat-earth" policy which deliberately ignores institutional differences and whose effect – if not purpose – is to squeeze small universities out of the funding picture;
- the significant degree of underfunding of the mathematical sciences;
- the role of the HQP category in the DG adjudication process, which actually works against NSERC's goals of fostering HQP training and reducing "inertia" in the funding process;
- the shift towards industry-related research and industrial partnerships, at the expense of basic research, which is particularly damaging to the funding prospects of researchers who are working in non-applied areas of the mathematical sciences and/or who are located in rural or small-urban regions without a strong industry base;

- the erosion of peer-reviewed grant adjudication and the erratic nature of funding outcomes;
- NSERC’s “one-size-fits-all” policies, which pretend that all NSE disciplines are alike (interestingly, NSERC does not apply this policy to the allocation of funds, as evidenced by the variation in average grant sizes across disciplines);

We commend the long range planning committee for the very important work they are doing to represent the diverse voices of Canadian researchers in the mathematical sciences.

Sincerely,

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