Advice on NSERC Discovery
and RTI Applications

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1   Preamble

I built this document from a small set of notes I took while serving on the Computer Science Evaluation Group[1] for the 2010 competition: how the process works, what reviewers tend to look for, and both good and bad ideas for writing an application. This is in no way official advice, partly reflects just my own opinions which you may profitably ignore or disagree with, and may be inaccurate for future competitions if rules or procedures change.

For more official information, there is of course the NSERC instructions for each of the forms. I'd also recommend at least skimming the *NSERC Peer Review Manual* to get a better handle on how your application will be evaluated.

2   The Discovery Grant Process

The Form 180 in August starts the ball rolling for Discovery grants. The only purpose of the form is to help NSERC select who will review the actual application. The bottom line is that each application will be read by five EG members and up to five external reviewers.

If you're interested, the selection process is actually a multi-stage affair:

1. The members of the EG mark conflicts and comfort level for each application.

2. NSERC staff pick, for each application, one EG member who is most comfortable with the subject of the research program (modulo conflicts and load-balancing).

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[1] Note that the Grant Selection Committee (GSC) is a thing of the past: there is a single Evaluation Group (EG) for all of computer science, one of 12 EG's within NSERC. The EG is composed of approximately 25 people, mostly from Canada.

3. This EG member in turn selects the ordered list of five potential external reviewers to contact. This list is only partly drawn from the applicant's suggestions. Conflicts and members of any NSERC committee are screened out, and no external reviewer is asked to review more than two applications.

4. Later, NSERC staff pick five EG members for each application: a primary, a secondary, and three tertiaries—taking conflicts, comfort level and load balancing into account.

In February, the EG meets for a week to come to an agreement on all applications. The five members on an application spend approximately fifteen minutes discussing its strengths and weaknesses, with reference to both the application and the external reports, before voting for a score in three categories: Excellence of the Researcher, Merit of the Proposal, and Contributions to Highly Qualified Personnel. (Note that external reviewers are not included in this vote; their reports are certainly valued, but are not calibrated enough to be used quantitatively.)

There are six possible scores in each category:

1. Exceptional (reserved for a very small and elite group of leaders)

2. Outstanding (what most of us should be very happy to achieve)

3. Very Strong

4. Strong (very approximately the threshold for funding)

5. Moderate (the disappointing not-quite-good-enough cases)

6. Insufficient (clearly bad)

The median vote of the five members is taken for each category, giving three final scores for the application. These are summed to get a final number, putting the applications into bins: all the Exceptional-Exceptional-Exceptional applications, if there are any, will be in bin A, those with two Exceptionals and one Outstanding go in bin B, etc. Note that the three categories are weighted equally: an Outstanding for the Excellence of the Researcher is completely equivalent to an Outstanding for HQP. All applications in a bin will be funded the same amount.[2] The duration will be five years except in the infrequent case where the committee votes that the applicant needs to be (or deserves to be!) reevaluated sooner.

Note that the applicant's previous funding amount is now irrelevant: all that matters are the scores in the three categories and the bin those sum to. Of course, there is an indirect impact on contributions and HQP, but generally speaking the dollar amount

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[2]Technically there is also a score for Cost of Research: Low, Normal, or High. If the five members decide the research program intrinsically requires more or less money than a typical computer science program does, the final funding amount could be adjusted slightly up or down. However, virtually every computer science application is given a Normal cost: the very rare exceptions include, for example, a Low cost for someone from industry with an adjunct appointment who doesn't have the same basic operating expenses.

of the previous NSERC Discovery grant will be completely ignored throughout the process.

The actual funding decisions are not made by the whole EG: that is done by the leaders of the group after the binning is complete. The bins are essentially funded starting from the best (A) and going down, until the money runs out. There are a few exceptions: an application with any Insufficient score cannot be funded, and neither can one where the Excellence of the Researcher is only Moderate. In the last funded bin(s), there may be some extra deliberation—e.g. Early Career researchers (no more than two years into a job where they can supervise HQP) may be funded when others aren't, or only some combinations of the three scores might be funded.

There is also the Discovery Accelerator Supplement program, for applicants who have a strong track record and who, with a shot of additional short-term money to help, could be superstars. These are typically outstanding people 5–15 years along (not junior, but definitely not senior) who haven't yet reached their full potential. Likely candidates are flagged by the committee when voting, and the final list is determined later by the EG leaders. There is nothing special for the applicant to do to be considered. The university may, however, put forward a few people who are in the middle of their current NSERC Discovery duration so that they can be considered for the DAS—but with the risk that the researcher won't get it, and may even end up with a smaller Discovery grant if their application isn't strong enough.

3 The RTI Grant Process

For RTI applications, the process is lighter weight. There are no external reviews; a subcommittee of the EG together establishes a ranking of the proposals from best to worst, based on the usual criteria (with urgency playing an important role in Merit of the Proposal, alongside Excellence of the Researcher(s) and Contributions to HQP). In the case where an application presents cheaper alternatives to the ideal, only the ideal amount is considered unless the committee votes to evaluate the application based on one of those alternatives. The applications are funded going down this list until the money runs out.

One thing to be aware of: the absolute dollar amount requested is not considered when ranking the applications. An application that is well justified in all the criteria will always be ranked ahead of one that isn't so urgent, regardless of how much they actually cost. In other words, research depending on more expensive equipment isn't valued more or less than intrinsically cheaper research.

4 General Writing Advice

The primary audience for the applications are the members of the EG, who each have on the order of 80 grant applications (and supporting documents) to read and re-read

in approximately two months. It's thus important that your documents be as readable as possible.

You can safely assume the reader is a good computer scientist with a general appreciation for your field even if they aren't part of it, and that they understand the Canadian funding system. However, given the small size of the group and the issues of conflicts and load balancing, it's unlikely that more than two EG members reviewing your application will actually be in your field, and quite possibly none of them will be. Don't water down the meat of your application or talk down to the reader, of course, but explicitly help the reader understand context, significance, impact, etc. that may not be obvious to an outsider. (For Discovery grants, hopefully there will also be a few external reviews from experts in your field, and if they are properly written they could hold a lot of sway, but don't rely on that.)

On the flip side, be cautious discussing areas in which you are not an expert—one of the committee members or reviewers may be an expert in precisely that field, and find mistakes that could severely count against you.

Use a spell-checker, including on the parts you enter in the textbox on the NSERC website, not just the freeform sections. Get someone else to proofread it for mistakes in grammar and the like: we easily become blind to mistakes in text we have worked on for a long time.

Don't try to squish in more text by decreasing the line spacing, unless you want the reviewers to be angry when they're trying to read your application. The "accepted" font is Times New Roman, 12 pt; you might try a comparably sized typeface such as Baskerville[3] if you find it more attractive, but you are not allowed to go with anything noticeably more compressed. In general, if you're having a hard time fitting in all you want to say, the solution is almost always better editing rather than layout tricks! Another person's fresh perspective may help if you have editor's block.

Be very cautious about **bolding** key phrases, as when it's **overdone** it's very **distracting**, makes your application look **amateurish**, and sends the **message** that the rest of the text in between is **unimportant**.

A *little* leavening humour, if tasteful and subtle, can be very welcome in the middle of reading a huge pile of applications. However, don't risk it unless you're confident it will go over well—and it's still probably best to run it by someone else first.

Illustrations also are a fantastic way to break up a monotonous sea of text, and done well are well worth their space in words. Your primary audience is, again, members of the EG who may not understand the finer details of your research; a good diagram can be a great complementary tool in getting the ideas across. Some applicants have even used figures in explaining their budget (e.g. schedule of student projects), though that can easily be overkill. Be sensitive to readers who may use a black-and-white print-out of your application, but since NSERC now prefers to send electronic versions (over the web or on USB thumb drives) colour can work well.

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[3]If you are a TeX aficionado, consider XeTeX if you don't already know about it.

Get to the point; use words well. Tedious verbiage, bland superlatives, tired buzzwords, and stating the obvious—

> "A significant paradigm shift for the entire field has emerged in recent years, impacting all areas of computer science and in fact society as a whole, namely that the major performance gains needed for future areas of growth such as cloud computing will require algorithms with greater parallel scalability, as the era of steadily increasing clock rates has come to an end: this critically informs all aspects of my innovative research program."

—waste space and attention. Don't dilute the essence of the application. Remember the audience consists of your peers, who will not be impressed by breathless bluster.

Don't complain. Even though we all know the system has flaws, your grant application is not the place to write about them. At best it wastes space, and at worst it raises questions of how serious a researcher you are!

Be careful to follow the rules, even the ones you disagree with: it's bound to count against you otherwise. For example, be careful to respect the six year limit on HQP and most significant contributions.

Think of ways in which you might stand out, small things that might make your application memorable, and that can stick in a reviewer's mind or be used as a hook for arguing for your application getting a high score. For example: a high "h-index" if you have one, a company that used your research to do something of practical importance, an authority that cited a paper of yours as being especially important to the field, general media attention, etc. There's no substitute for real strength, but you may do yourself a disservice if you don't communicate it well enough.

5 Form 180: Intent to Apply for a Discovery Grant

The only purpose of the Form 180 is to help NSERC and the EG members choose who is going to review the actual application.

The most important thing to get right is the choice of Evaluation Group. Unless you are joint with another department, this is presumably going to be Computer Science (1507). However, if your research borders on the domain of another EG, and you indicate this with the choice of Research Topics, NSERC may well involve a member or more from that EG in considering your application—the new system is expressly open to interdisciplinary work.

The second most important thing is the selection of the ordered list of Research Topics. Be especially judicious about the choice of the first research topic, as that will be used first for sorting the applications. If you have a hard time deciding which topics to pick and how to order them, I would put more weight on deciding which community is best

able to judge your past contributions. (And be very careful if you *want* to move into a different area of research but haven't yet had much impact in that area—that path is fraught with reviewing peril.)

Next is an informative title and (somewhat less importantly) a good set of keywords, which also show up in the spreadsheet of all applications, and are helpful to the EG.

With all this in place, the actual description of the proposed research program isn't so important—it may not even be read. It doesn't have to be a finely chiseled jewel of persuasion at any rate.

Of course, the other major aspect of the Form 180 is the list of suggested external reviewers. A good choice of reviewer is someone who

- is an expert in at least some aspect of your past or proposed research,

- has a strong reputation in their field or otherwise commands respect (e.g. has a high position in industry and can comment on that aspect of your past or potential impact—though probably most of your reviewers should be academics),

- and is likely to write a proper and fair report for your application (i.e. they take their professional service seriously and they know of you).

The list as a whole should ideally cover all aspects of the proposed research program— a very nice touch is to annotate your list of reviewers with comments indicating what parts of the research you think they can cover. Again, if you are moving into a new area, I would bias the list towards people who can comment favourably on your past contributions.

NSERC will use at most three of your suggestions, with the remaining ones selected by an EG member. It's quite possible this person will not be in your field, and may make use of the list of past external reviewers, which is heavily biased towards Canadian researchers, or look through the research groups in the better Canadian universities for good matches. Therefore, my advice is to put the emphasis of your list on the best choices from outside of Canada, and perhaps leave a few of the obvious second choices from within Canada to be selected by NSERC—within reason.

Finally, as explained above, while external reviews are certainly considered by the EG members when voting, they don't have a direct impact. Reviews that are too short, that betray a lack of understanding of the Canadian system, are unprofessionally negative, or otherwise are uncalibrated will be taken with a grain of salt or may be discounted entirely as the situation demands: don't lose sleep over the choices here.

6   Form 100: Personal Data Form

I am putting my notes on the Form 100 first, as it's arguably the most important, and is common between both Discovery and RTI applications. However, by default it appears

after the Form 101 in what is given to reviewers, which may be important to take into account when writing a proposal—for example, citations to your Form 100 list of publications in a Form 101 should be explained as such.

A big part of writing the Form 100 is not just telling the reader what you have done, but also making it easy for them to judge the importance and quality of what you have done. Don't make them work hard to figure out how good you are.

For example, provide guidance on what to make of all your research contributions: explicitly state what are the top venues in the field, and if you publish elsewhere explain why. Publications in dubious venues without a good reason can easily count against you. Quoting acceptance rates or impact factors for a venue isn't particularly valuable: there's so much variation between subfields that those metrics are next to useless. However, I would opine that citation counts (the standard seems to be Google Scholar) are worth sticking in if big enough. NSERC policy is to never look up impact factors, citation counts or the like, due to the poor calibration, but if they are included in an application they are fair game for the reviewers.

6.1 Most Significant Contributions

Only your research contributions in the last six years may be included. Technically there's wiggle room in that if the impact is being felt now, you can include things before six years ago: however, I would be *very* cautious when doing this. The readers may disagree with your judgment of the impact, or may suspect you are resting on your laurels and have slowed your research pace. My reading of the intent of the instructions is that this really only applies to work that *started* having an impact in the recent past, not work that is continuing to have an impact. If you do decide to include something old, it's probably a good idea to explicitly justify why. On the other hand, if you have done something truly important in the more distant past that's relevant to the proposal, I'm sure you can work in references to it in a more subtle way, to make sure the reader is aware—for example, in the literature survey on your Form 101 for Discovery Grants, or anywhere that it helps set the context for recent or future research.

Highlighting HQP involved in your most significant contributions is a good idea: it's another way to really push forward your commitment to, and track record of, training—which is fully one third of your total score. You might, for example, include the student names in the heading for each of the most significant contributions.

Stand out if you can, with compelling measures of impact even if they are not "traditional". Everyone knows a paper at a top venue may nevertheless have almost no impact, and be quickly forgotten; provide evidence that your work goes above and beyond if you can. Discussing the technical details of your work without reference to the impact is basically a waste of space, unless the idea is so obviously ingenious and powerful that even a reader who is not in your field will be excited by it (but even then, they may not be sure how original it is). As mentioned earlier, impact on industry, media attention, glowing citations from leaders in the field, very high citation counts

are all examples of ways to stand out.

Note, in the instructions: "A contribution does not have to be a single publication or report. For example, a group of publications on a specific subject could be discussed as one contribution."

6.2 Research Contributions and Practical Applications

Collaboration with your students is always good. The de facto standard is to put supervised students and postdocs in bold when listing publications—readers certainly pay attention to this in trying to judge your contributions to HQP.

Extensive collaboration with a colleague, particularly one more respected than you, should be carefully handled—you want to dispel any notion you're not capable of good independent work.

Don't bother to include submitted works unless you're desperate: it makes you look desperate. Similarly be very circumspect with non-refereed contributions: you want to make sure they're providing inarguable evidence of impact, rather than padding your lists.

Separate your publications into fine categories: for example, make sure refereed journal papers are separate from refereed posters!

As always be careful to follow the rules. Including publications beyond the six year limit here, misclassifying an extended abstract as a paper, or having the appearance of double-counting one body of work are at best irritating to the reader, who will have to carefully cross out the offending items.

Feel free to comment on your publication strategy—for example, if your output might appear low but it's because that line of research requires long efforts in system-building, it doesn't hurt to say so.

6.3 Other Evidence of Impact and Contributions

Don't forget to include your professional service: it's a tell-tale sign of respect in the field that readers are explicitly looking out for.

6.4 Delays in Research Activity

Don't be shy about including heavy administrative load, leaves, illness etc. here—I'd say the people on the EG are pretty sympathetic.

6.5 HQP

HQP contributes one third of the score that determines your funding bin. While probably the major part of this is simply your past record— how many students you have supervised, how you publish with them, and what careers they have gone on to—some effort spent in writing here could easily help you get your score "rounded up". Also, don't localize discussion of HQP to just the official HQP sections of the application, but make it pervasive.

In this section, don't just list past students—talk about how they are involved, your mentorship, interdisciplinary aspects of the training. Don't forget undergrad involvement! Mention special achievements of students: best student paper awards, later jobs as professors or CEO's or the like, etc. Even discuss your graduate teaching outside of supervision if it really stands out, e.g. a popular graduate textbooks you have written. You want to catch the reviewer's attention, to make it easy for them to internally justify why your application should be rated higher—it's not just that you have a reasonably long list of students with decent careers, but that you shine in ways most people can't write about.

Be careful about how you count undergrads in the HQP summary. Certainly USRA's and honours theses count, but lesser involvement probably doesn't. (Some applicants have been known to include every student taking a capstone course that they teach, giving an outrageously high number without explanation, which is then promptly discounted by the readers.)

If you work in an area where it's very difficult to attract students, feel free to mention it—this is taken into account, to some extent. However, you ideally want to make up in quality of training what you lack in quantity.

7   Form 101: Application for a Discovery Grant

One way of thinking about the funding from the committee's viewpoint is that they are betting taxpayers' money on researchers. You want to come across as being risk-free for getting good solid work done (the research program is feasible given your expertise, you have a strong track record in the subject area and a track record for HQP), yet you also want to present the possibility of "striking it rich": your program should be ambitious and broad enough that, while still tethered to reality, the committee thinks big things could happen as a result.

7.1   Summary of Proposal for Public Release

The summary is probably the first thing the reviewer will read. It's a perfect place to give the big picture, introducing the main theme of your application, and maybe describing a choice example of expected impact that can then stick in the reviewer's

mind. It *is* supposed to be understandable to the general public, not just reviewers, but I would say you can at least assume a good general knowledge of computer science.

Also, don't waste space and attention later by copying and pasting the summary into the freeform proposal. The readers will have already read it.

7.2   Proposed Expenditures

The budget is to some extent irrelevant, so don't worry too much about nitty gritty details. As long as your budget isn't wildly different from the norm, readers probably will ignore the precise breakdown.

Ask for a healthy margin above what you think you might realistically get. There is a rule that you cannot be given more than what you ask for, but there is no penalty for asking for too much—and of course, nobody checks up on how well your spending matches your proposed budget. On the other hand asking for a ridiculously large amount, especially if this is not your first Discovery grant, might seed the thought in the reviewer that you're a bit out of touch with reality, or think too highly of yourself.

You might as well ask for exactly the same amount each year: that's how the funding comes. Proposing different amounts each year adds pointless cognitive load to the reader.

Basically every budget should devote the monet primarily to students, with maybe travel a distant second. In terms of presenting a good "return on investment" for HQP, it probably looks best (if it makes sense for you) to split the funding up as partial support for more graduate students—and looks worst to pay for a single full post-doc.

7.3   Budget Justification

In most applications, this is pretty boring and skimmable—but it needn't be. The instructions say that "this page should only contain information pertinent to the budget." However, I don't think it's actually limited in length to one page—certainly I've seen applications with more for this section—and plenty of interesting things can be deemed pertinent to the budget. Don't view this as overflow space from the proposal, of course, but instead as another chance to stand out from the crowd. For example, if your budget includes supplies for a particularly interesting experimental set-up, you could justifiably have a picture of it and a small blurb discussing it from the equipment side, adding to the excitement.

An obvious secondary use for the budget justification is demonstrating your commitment to HQP training (one third of your total score). When you justify the number of students you will be paying from the grant, you can weave in details on what students will be doing in your research program—ideally with their names if you already know, but at least identify the sub-projects they will be working on. If the budget involves costs associated with nonstandard equipment, or interdisciplinary work, that can also

add to the image of a stimulating environment for HQP training.

Likewise, if a lot of your students get scholarships or high profile industry internships, make that known when you justify how you will support the number of students with this amount of money. It's another sign of a good track record and potential for HQP training.

Don't dilute this section with trivia about how much printer paper costs etc. Under equipment, the instructions ask for "models, manufacturers, prices, an applicable taxes", but be brief when it comes to standard things like general purpose computers unless you're going very high end (and expensive); I think most people essentially just state a dollar amount for a generic PC and leave it at that, and I've heard no complaints about this.

As I said previously, there's no sense in complaining about how little money you get from NSERC—but you might gently mention how students in Vancouver are on the expensive side, due to the real estate market etc. I doubt reviewers will be consciously swayed by that argument, but I don't think it can hurt if subtly worded.

7.4   Relationship to Other Research Support

Be careful with this, especially if the title of another grant looks like it overlaps with your proposal. Readers aren't looking for much detail, but they do want it to be clear you're not asking for double funding. At the same time, it certainly doesn't hurt to indicate some leveraging, indicating that the money will go a long way.

7.5   Proposal

Note that Discovery grants are for a research *program*, an umbrella that can cover many projects but is somehow more than the sum of its parts. Enough reviewers care about seeing a coherent over-arching theme that I would make sure you have one. Sticking in a miscellaneous extra topic especially if it doesn't really match your field of expertise, or could be viewed as tacked on to fill space, is not recommended.

Tell a story that can be appreciated by people outside your field, while not being afraid to get into the crucial technical challenges and innovations (that set you apart, and make it clear this is deep, meaningful research worthy of a lot of money over a long period of time).

7.5.1   Recent Progress

Make sure you're not repeating too much between this and your Form 100. This is really about setting the stage for the next section, both introducing what you're going to work on and demonstrating you are supremely qualified to tackle the program.

The instructions also ask for "the progress attributable to your previous Discovery Grant", but I think this can be pretty light-weight. Readers will probably assume all past research is in some way attributable to basic operating funds, and aren't going to worry (if there are lots of other grants) that somehow the past Discovery money wasn't exploited!

As always, it's good to highlight HQP involvement (with specific names if possible), as it will count towards that third of your total score.

7.5.2 Objectives

Be ambitious and not too narrow: you want to stretch yourself, proposing possibly risky new things that other people are going to care about. At the same time, you want to get across that you are the best person for the job. (If part of your program involves shifting into a new area where you're not yet an authority, showing some degree of collaboration with an expert can help).

On the flip side, there's a danger of putting too much in—some reviewers complain if an application seems to be spreading the researcher too thin, that either it will be infeasible to do it all or that the impact won't be there because the applicant won't be able to follow up. There's a balance between breadth and depth, quantity and quality, that you need to carefully consider.

This is of course a possible place to include specifics on future HQP.

7.5.3 Pertinent Literature

The goal of this section is to convince the readers you have a full appreciation for the field, not just your own research work, and that if your program overlaps other fields you are aware of them. Missing something that a reviewer considers to be of critical importance certainly can hurt. Be careful.

Even if one of your own papers is relevant and doesn't appear in the Form 100, be cautious including it here (or rather, in the References section further on). If it's truly important (i.e. you would expect another researcher tackling a similar research program to also cite it) then go ahead—but it will look bad if, say, half your citations are to yourself.

7.5.4 Methods and Proposed Approach

I think complaints over methodology are the most common: this is where it's most likely that the "Merit of the Proposal" score will be downgraded. You have to convince the reviewers that you can do what you say you want to do: it's not just that you have a good track record and have identified a great area to work in, but are going to tackle

it in a way that is likely to work and in a way that other people wouldn't think of.[4] This is where an applied proposal makes the jump from simple development to actual scientific or engineering research, and partly where a theoretical proposal demonstrates feasibility. Even if your track record is stellar, if you don't specify clearly enough how you are moving forward into the future in a way that makes it deep research, you will be marked down.

There may be opportunities to highlight how HQP will be involved here as well.

7.5.5   Anticipated Significance

Make sure readers outside the field can appreciate this, while not neglecting the detail expected by experts.

7.5.6   Training

Hopefully by this point it will be clear that HQP training is an organic part of the program, not just boilerplate you put here. Of course you do want to say something good here, without much overlap with the Form 100, perhaps hitting on:

- commitment to undergrad research as well as the graduate level

- interdisciplinary or other stimulating aspect of the training environment

- how well it prepares students for excellent careers, or ipso facto how training in this program will make students especially attractive to industry

- how you mentor your students (the nature of your involvement, and your thoughtful reasons why you think it works best)

- exposure you bring to your students outside the university: conferences, industry connections, collaborations, . . .

The default is to say something bland about how all the objectives you've given have room for students—make sure you stand out instead.

7.6   References

Certainly don't include your own publications in the Form 101 bibliography if they will appear in the Form 100—use a forward citation instead, and explain how you denote them. I don't think there's any real standard way of citing things, but probably the approach that I've seen most often is to use plain numbers like [8] for papers listed in this section, and to add a letter prefix (indicating the category of publication: [J3] for a journal paper, [C10] for a conference paper, etc.) for the ones listed in your Form 100.

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[4]Even better is to cause the reader to cry out loud, "Why didn't I think of that? It's so obvious now!"

7.7 Samples of Research Contributions

If you can, show breadth to match your proposal with your contributions: certainly think twice about including two very similar papers.

I've seen at least one application which actually included a book as one of the sample publications—it is a valid option.

8 Form 101: Application for an RTI Grant

Many of the points raised earlier about writing apply equally to RTI applications; there are only a couple of points to add.

I would recommend, if it at all makes sense, to include a cheaper alternative budget or two. If the committee thinks your justification for the primary amount requested is weak, you could get a second chance at being funded if you have included a pared-down option that they can vote to consider instead. Of course, it should be clear in the text that you will suffer in some clear way if they go with a cheaper version (otherwise, there's no point in including the expensive version). The committee is specifically instructed not to choose a cheaper option with the objective of funding more grants—a cheaper option is considered only in the case that it's felt to be intrinsically more appropriate.

Urgency is an important factor in evaluating RTI applications. The total budget for the program is fairly limited relative to the number of applications: it's basically what is left over at NSERC from the previous fiscal year, if I understand correctly. A sizeable percentage will not be funded. I think the highest ranking applications tend to be from good researchers or groups of researchers who will simply not be able to do their research (or compete on the international stage) without the equipment; even a stellar track record won't make up for a request which is seen as more of a luxury.