

## NSERC HINTS FOR DISCOVERY GRANT APPLICANTS

Revised 2003

NSERC's Web site address is: <http://www.nserc.ca>

See also NSERC's document entitled "How to Prepare a Winning Proposal" at:  
[http://www.nserc.ca/programs/winnprop\\_e.htm](http://www.nserc.ca/programs/winnprop_e.htm)

### General Comments:

Success in grant applications in a highly competitive climate dictates that, beyond having an excellent research problem, the applications and supporting documentation be written in the clearest and most effective manner possible. Knowledge of the review process, criteria used and the importance of the various forms comprising the application process is essential. In addition to the details provided by the granting agencies with the application forms the following information gleaned from the experience of successful applicants and colleagues who have served on grant selection committees may help to highlight points and provide information to consider in preparing your application. These comments relate primarily to NSERC discovery grants.

### The Grant Selection Committees:

See *Committee membership lists and Peer Review Manual* at <http://www.nserc.ca/comme.htm>  
Each NSERC GSC consists of about 10 scientists from across Canada, occasionally including foreign scientists. Members are chosen to cover the various aspects of fields but it is quite possible that no one on the GSC will be familiar with the current state of your specialty. Usually the GSC chairperson assigns two internal GSC reviewers to provide independent detailed evaluations and recommendations for discussion by the committee as a whole. NSERC expects that all members of the GSC read all the research grants and in many GSC's this is indeed done. All GSC's use external referees usually selected by the GSC chair upon the recommendations of the assigned primary GSC reviewer. Generally at least half of the external reviewers are selected from the applicant's form 180, with the remainder selected by the GSC. The decision on an application is arrived at by the GSC as a whole after discussion of the internal reviews, external referees' reports and other factors. This is usually by consensus or, when necessary, by a vote.

### The application and advance material:

There are 3 primary NSERC forms which should be completed with great care since they will significantly affect the review of your grant application.

### Form 180 Notification of Intent to Apply for a Discovery Grant: (Due August 15, 2002)

This form should be filled out with care since it is the main source of information for the GSC chair in selecting the most appropriate internal referees for that applicant as well as for the

individual who selects the external referees. Note that the GSC rarely contains an individual who is an expert in the applicant's area. The GSCs are not large enough to cover all areas but members are usually able to provide a broad level of expertise.

In writing the research summary section of Form 180, remember that the reader is not likely to be an expert in your area but will be selecting your referees. Try to provide a clear summary and objectives without invoking too much complicated detail. This will insure that the most appropriate referees are selected. The research summary part of this advanced material is not used as part of the application review process later in the fall. (Preparing this summary however provides the perfect opportunity for you to begin to draft up your formal application. This draft should be read over by a colleague for critical comments).

You are asked to provide the names of up to five potential external reviewers. There are some things you should be aware of when making your choices. the GSC will usually use 2 or 3 from your list and add 2 or 3 others. Name the best people who know your work but who are not former colleagues, students, collaborators. Select referees who you know will be objective. If at all possible, it is a good idea to include some Canadians in your list. They are to some degree known entities to the GSC and more importantly know research funding and the NSERC system. You should, if they are appropriate, also feel free to suggest international experts but judge whether or not they are likely to respond. Selection of individuals who have the appropriate expertise as well as are likely to provide perceptive, detailed and unbiased comments on your application can be very positive factors in your review. Remember also that the external review comments constitute only one source of input into the GSC's evaluation.

**Definition of New Researcher:** A new researcher is one who is new to the university system (e.g. has been in their first eligible position at the university for less than 2 years).

### **Grant Application - Form 100 Personal Data Form and Form 101 Application for a Discovery Grant:** (due November 1, 2002)

It is important that applicants be aware that the criteria employed in determining awards are:

1. Quality of the researcher
2. Quality of the progress report and proposal
3. Need for funds
4. Contribution to the training of highly qualified personnel

The relative balance between these criteria may vary between GSCs but NSERC encourages equal weighting. However, this is not easily defined and may vary due to circumstances and career stage in any individual case. It is easier to judge the track record and quality of a long time investigator than another at an early career stage, for example. In any event, the quality of the proposal weighs considerably in most GSCs, so it is imperative that even investigators who have been funded for many years do not rely solely on their past record. Funding pressures are so intense that the proposal itself plays a pivotal role in determining whether or not even very good investigators maintain their funding.

### **Form 100 - Personal Data Form:**

GSCs tend to take the revised Form 100 very seriously and so should the applicant. Make sure that any discussion of interests and research program participation levels are up to date. </Ensure that the information is accurate and particularly that your personal bibliography is

exactly right and organized as NSERC requests. The mixing of abstracts and conference talks with refereed papers in the primary literature will cause suspicion on other aspects of your application. When papers are in press GSCs will accept that the journal has agreed to publish it. Some GSC members ignore papers submitted, but you could list them as a separate group. They help create the picture of an active and productive individual or lab. The emphasis is not so much on the quantity of publications but rather the quality and impact of the papers. The section asking for 5 significant contributions should not just list papers. There should be a discussion of five impacts on the discipline.

Committees look for recent publications in respected journals. The quality rather than the quantity of publications is taken into consideration. Indicate why you publish in certain journals. These may not always be the most prestigious but they may be very appropriate for the subject matter. Many committees do not use the citation index as an indicator of impact. In engineering committee 13 it is becoming more important to have peer reviewed journal publications - if only industry papers have been written, a grant is unlikely to be awarded

Include details of your contribution to training of personnel. This should highlight graduate students trained, PDFs, honours students, summer students, visiting scientists, technicians. Include details such as names, present positions, award winners etc. If you have had little or no involvement, explain the reasons. Spell out specific publications that relate to students you have trained during the NSERC funded research program. Name the students who have graduated. Note that the committee will question your publications if students trained do not also appear in the author's list in publications. Indicate what the students are doing now as it shows impact on the discipline. Include a discussion of the graduate student projects supervised and how these projects relate to your research program and funding sources. Often there are complicated relationships between research supervisors and sources of funding for a given student. The committee needs to understand these in order to evaluate the impact of its funding decisions on student training and support. Clearly identify joint supervision as well as sole supervision.

In describing your contribution to collaborative work and multi-authored papers indicate the ideas, innovations or expertise you provided rather than the percentage of work. Explain the nature of the collaboration with researcher "x". Discuss the impact. Highlight any unique, innovative contributions of your research papers rather than simply summarizing them. Has the work set new research directions? Has it resolved some long standing or important issues? For collaborative work, the fraction of research time to be devoted by each member is required. Committees consider serious collaborators as those with a time commitment of 30-40% or more of their total research time. Research groups would be wise to be selective in the projects for which they show participation indicating stronger commitments to a smaller group of projects. Each person's commitment should be explained in detail on the personal data form. Each person should state clearly what is their own first priority for research. Accurately explain circumstances that may have led to delays in publication or caused significant research career perturbations: serious illness, childbirth and so on. This is not a place to make excuses but to describe legitimate situations which have had an impact on one's past research activities.

### **Form 101 Application for a Discovery Grant:**

The Summary section of Form 101 can be the most important section of the application. The majority of Committee members will read this section and decide from it whether to read further. Write for the non-expert and expert but keep the topic focused. Clearly and concisely state the

goals of the research in words that most committee members could be expected to understand. Avoid jargon!

It is important to have the proper balance between the progress report and the proposal. Do not spend most of the allocated pages on progress, but leave sufficient space to present a clear and detailed proposal. Discuss your progress because of NSERC funding, not progress in general. Your application will be judged on the quality and impact of research accomplishments. It is important to place your research in context and to address the questions of importance and impact, past and future. Your presentation must be well organized so that it is clear what you have done, what you want to do, and why it is important that this research be done. Bad organization is dangerous and usually fatal to an application containing worthwhile science. It is important to clearly state both your long term and short term (next grant period) goals. It is important to remember that the regular grant supports "program" funding, not "project". Observe the space limitations and adhere to the guidelines regarding font style and particularly type size. Any material you submit that is in excess of the maximum space allowed will not be sent to the GSC. All pertinent information you wish the reviewers to read must be in the grant application. Cover letters and appended materials are not sent to the GSC. Overlong applications, poorly organized and in small, difficult to read, type will irritate the readers unnecessarily. If the committee can't understand an application because it is not clearly written, then chances of success are minimal. Have another colleague read and comment on the application to test the clarity of your writing.

Cover letters should be used to alert the NSERC secretariat to potential problems in the review, for example if you have changes in the orientation of your work or you think that a certain GSC may not be the most appropriate to review your application.

### **Special Circumstances:**

Committee comments are often provided to the applicant after the competition. Whether you receive comments or not, certain situations are often seen as a "message" from the Committee and require special attention when reapplying.

1. Committees take into consideration the stage of an applicant's research career. Researchers who are re-applying for their second multi-year grant are the most vulnerable (first renewals). Committees tend to scrutinize these applications for evidence of progress, impact on the science, training of students.
2. A one year award could mean that the Committee wants to see more progress before awarding a multi-year grant. This is often the case with a new researcher or a researcher new to the discipline. For an established researcher this could be a clear warning that a strong application must be submitted in the next competition or the entire grant is in jeopardy.
3. If an established researcher is not funded, extra care must be taken in the reapplication to address all of the committee comments and reviewer comments that are provided.
4. A brief statement of how the sabbatical impacts on the research program is sufficient. Don't waste the GSC's time explaining at great length how you and your students will cope with a sabbatical; the members have had sabbaticals themselves. If you have been on sabbatical clearly show how the research has progressed and students have been supervised.
5. If you have submitted publications but have no resulting acceptances yet, provide the dates of submission and acknowledgement from the publisher with an anticipated date of publication.

Many committees ignore submitted papers entirely until they are listed as accepted.

In addition to these general comments, the following list contains some of the specifics to keep in mind while writing your application:

### Details:

1. Remember for whom you are writing. Your readers may not have a close familiarity with your specialty. It follows that you should write in a way that makes it clear what you are up to and why it is important. If in doubt about this, get a friend outside your specialty to read your application and comment, before it is submitted. This is especially important if you are trying to get a grant back after losing one. If you would like a friendly adviser from the faculty's research committee, notify the dean or ask Research Grant and Contract Services to arrange for a review.
2. Be positive in tone. Negative or defensive writing is dangerous to your health. Put another way, blow your own horn, but in a genteel way; if **you** don't do it, nobody else will.
3. The people on the grants committees are scientists, so they know what you are going through and they know that you may not have done everything you set out to do four years ago. There is no need for you to dwell on your own shortcomings. Stress what you achieved not what was not accomplished.

The progress report and proposal should be generously sprinkled with references to your own work, even older work. Remember that the committee will not have your earlier applications for reference. Explain what you have been able to accomplish with NSERC funds. Say if it has been seed money which has allowed you to leverage other funds.

4. Tell them why the work you are proposing is important. Nobody wants to put money into trifles. You can be quite direct about this:

"The results of these experiments will be important because..."

"It is important to know the answer to this because..."

If true, and it probably usually **is** true, point out that if these experiments lead to result A, then you will head off in one direction, if result B, then another direction. Experiments that open up other important avenues for research are usually winners. In the applied sciences, it is very important to discuss "impact" and "relevance".

5. Your style should be cool and scientific. Not rigidly formal and not chatty. Refer to your colleagues as Mr. King and Dr. Queen, not as George and Mary. Above all, don't be arrogant. Telling the committee they were stupid the last time they reviewed your application may relieve your feelings, but is a **very** expensive form of therapy. If concerns of a previous review have been addressed, make note of this in the positive way.

6. While it is generally not necessary to go into very fine experimental detail, you should note sufficient detail that the reviewers can judge whether or not you are using the best or appropriate methods. The objectives and methodology are very important. If you have preliminary data, discuss this. Reference to your papers and published techniques alert the reader to the areas of your technical expertise. If you are using a new area of techniques with little previous experience, it is helpful to indicate how these will be mastered. For example, assistance of a colleague (who should be named), new PDF joining the lab, visiting scientist,

special training course, sabbatical, etc.

7. Be scrupulously honest in completing the section on other grants. If a GSC knows you hold a grant or contract not listed, it throws the entire application into question. If there is overlap with other funding agencies, spell it out clearly. If it is left to the committee to guess at, you cannot assume that they will decide in your favour.

8. If you skip a year just because you have got money left over or are going on sabbatical, write to NSERC to let them know about it. This will help the GSC recover money in its budget when you come back.

9. On successful four-year grants from NSERC, you will be awarded the same number of dollars for each of the four years, even if you have applied for, say, \$20,000, \$10,000, \$20,000 and \$15,000. Include stipends for graduate students, PDFs, etc., as evidence of manpower training the funding will support. If possible, name the individuals being considered. Committee 13 (Mechanical Engineering) considers support of graduate students more important than postdoctoral fellows. Applicants should be extremely cautious of the practice of accepting students for projects before funding is secured. This should not be done without a contingency plan in place for supporting the student through an alternative award if the NSERC award is not successful.

10. If you are working with collaborators, avoid creating the impression that they are the ones who are doing all the work. Stress the complementation of expertise.

11. It is a great help to all department offices if applications can be finished before the deadline. Our secretaries can do better work if their jobs are not transformed into a last-minute cavalry charge. Start early! A recent example of the advantage of submitting your application early: a researcher omitted one of the required appendices. NSERC received the package a week early and identified the missing appendix. NSERC e-mailed the Research Services Office to contact the researcher and obtain the missing document. The application will still be accepted if the missing document is received by NSERC **by the competition deadline date**. If the researcher had sent the application to arrive at NSERC on the deadline date, the application would have been rejected as incomplete!

### **Research Tools and Instruments - Category 1 Applications (under \$150,000) - Form 100 and Form 101:**

Research Tools and Instruments - Category 1 (formerly equipment grants) are for equipment costing less than \$150,000. Even though competition funds are very limited, you are encouraged to apply since committee budgets are based on the number of requests for equipment to that Committee. Not enough equipment requests are being submitted. Don't give up after the first try. It is to your advantage to request needed equipment every year.

If you are requesting a piece of equipment to be shared with several researchers, each person must make clear what benefits this equipment will bring to their specific research.

It is important in equipment grant applications to demonstrate that the equipment is really needed. Most equipment requests fail because they are poorly justified. Indicate if there are no alternatives in the department or feasible research environment. Emphasize that the work cannot proceed or that the graduate students' programs will be significantly delayed without the equipment. Reapply in subsequent years if you are unsuccessful. With the limited funds it often

takes 2, 3 or more tries to be successful. It also indicates you are committed and a clear need exists. At present only about 30% of equipment applications are funded, and need is a major component of success. Committees vary in their approach to requests for workstations. For example, Committee 335 considers such requests favourably, whereas Committee 13 does not like requests for workstations unless very well justified.

*A moratorium has been placed on Research Tools and Instruments - Categories 2 and 3 (formerly Major Equipment and Major Installation) for 2003-2004. These are for equipment costing over \$150,000.*

nsercdo.wpd Faculty of Science Research Committee, September 23, 1992 Revisions by NSERC GSC members May 1997, Updated 8/2002  
(See also Addendum specific to Physics Project applications)

## **ADDENDUM TO HINTS FOR NSERC DISCOVERY GRANT APPLICANTS**

### **Project Grant Applications:**

There are a number of considerations that are specific to the discipline of Subatomic Physics, with its major emphasis on large collaborative projects, infrastructure, and its fixed budget envelope from NSERC. Typically, 90% of the funds available are absorbed by experimental applications. Only theorists get individual grants now. Most experimentalists get group grants. Committees look carefully at what your role is on the team and you must clearly explain this role.

The Subatomic Physics committee prefers to fund projects rather than individuals (the exception being applications from theorists). The Committee would rather fund one program via a single project grant than fund a lot of little pieces separately. This makes it easier for the committee to assess the support available to a given area.

Recently, the competition for funds has been exceptionally severe. Only the highest ranked applications were considered for funding. Beyond the three highest priority projects of SNO, ISAC and ATLAS, the committee could only meet its financial boundary conditions by not funding the majority of new initiatives, especially those with significant capital needs. They were forced to cut operating support to 'minimum survival' levels for existing programs which were not in the priority areas. Any applicants who received continued operating support at or near the level held previously, even in the case where the need for funds would imply a significantly larger award, should interpret this signal as a strong endorsement of the applicant and proposed research program. Subatomic Physics Project Grant applications requesting \$500,000 or more per year must be submitted by October 1.

The SAP committee places a lot of importance to the Personal Data forms. It is essential for these forms to be updated each year, and for the applicant's role and responsibility in each collaborative project to be clearly explained. Supervision of students and training of highly qualified personnel should be documented here as well.

Two reports prepared by the Subatomic Physics GSC are available to researchers upon request. The 1998 report on the Reallocations Exercise is available at [http://www.nserc.ca/programs/realloc/FB\\_19.htm](http://www.nserc.ca/programs/realloc/FB_19.htm)

**Research Tools and Instruments (RTI):** Although a moratorium has been placed on the overall Research Tools and Instruments Categories 2 and 3 (formerly Major Equipment and Major Installation), NSERC will accept Categories 2 and 3 applications in subatomic physics (GSC 19) for the 2003 competition. In order to apply, complete form 101 and append page 6. Part II should be completed following the page limits for Category 2 or 3 as appropriate. Detailed instructions are on the NSERC website.

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