NSERC – Grant Writing Workshop – June 2018

Moderator: Laurent Kreplak, Associate Dean Research, Faculty of Science

Panel of Evaluation Group (EG) members:
Alison Thompson, Chemistry
Evangelos Milios, Computer Science
Kimberley Hall, Physics
Donald Mitchell, Psychology and Neuroscience
Joanna Flemming, Mathematics and Statistics
Craig Lake, Civil Engineering

Introductory overview: please refer to attached slides. Please note that your Discovery Grant Notification of Intent to Apply (NOI) is due to NSERC by August 1st, 2018, and is a mandatory step in order to be able to complete a Full Application in the Fall 2018.

Equity Diversity & Inclusiveness (EDI):

1. How to integrate EDI in a research plan?
    - Encouraging a diverse and representative pool of emerging scientists, engineers, taking on leadership positions in NSE Outreach etc.
    - It could be people from within the lab and outside meaning people who have left, as long as it's within the 6 year window to show that the impact is still there.

2. How does one specifically identify the practices which will lead to EDI in the research plan?
   Researchers have to be able to demonstrate in the research plan that they are thinking/ working towards creating awareness within your research group. So as an applicant, it's important to write more about it.
   Example: Encouraging trainees to read about EDI literature or attend workshops that talk about EDI, encouraging trainees to work in an inclusive environment.

3. How does one articulate EDI in recruitment?
   If there is a policy on EDI and you follow it then mention it in the application. It's not expected that all researchers have to have a policy or standard procedures and follow it, just outlining whether EDI holds a good position in your research practice.
   Note: There is a space for updating EDI initiatives in the DG applications, if a researcher has anything that they are really working towards in terms of EDI in their research plan, then they should mention it but if there isn't then, there is no need to make stuff up.

4. Is there any change in the NSERC DG application with the new funding for STEM from the federal government this time around besides EDI?

   There is more money but no other changes so far. To add to that the more money might flow into new partnership programs and so on but DG might not benefit from those extra funds directly.

5. How to demonstrate or identify whether EDI has been taken into consideration especially when it comes to LGBT situations etc.? Are there benefits in doing that or are we giving away too much personal information?

   - EDI is new at NSERC, but like all categories, it's a demonstration of value and impact. Writing about individuals like that is inappropriate because then there may be an assumption of somebody's gender based on that and that is not reviewers' assumption to make, so one needs to be careful there. Focusing on inclusiveness is the key to demonstrating EDI's. For instance that people from those groups have approached you to be included in the research area as you etc.

     Note: Any sentence about EDI is a bonus but the lack of EDI has not been detrimental in any way.

   - HQP is one of the hardest categories to gain excellent and outstanding on. So there are little things that count and it can't just be EDI, it's encompassing the entire section as a whole.
   - Take a look at the evaluating GRID (Merit Indicator Grid) and see what the difference is between good and very good for instance and see if you demonstrate your HQP plan to be on the very good side of the GRID.

Common CV (CCV):

6. From the date of registration to the date of full application, what can be changed? CV, Titles etc.,

   Additions to Summary, CV's like publications etc., are acceptable. However, changes to titles create confusion because, during the registration process the application might have been assigned to a particular committee but with the change in the title they would have to revisit and potentially reassign the application. Title is very critical to reviewers so they can assess whether they have the expertise to review that particular application.

7. Are there any extenuating circumstances in the Common CV and how to put that in the CV effectively? If they have had issues in the last 5 years etc.?

   There are cases like maternity and illnesses etc., that come up and researchers do get credit for it. It needs to be mentioned in the CCV clearly.

8. Is it important to mention in the CV that the illness etc., would not be a problem in the future? Should it be mentioned that the person from the research group is back up to 80% or 90% capacity to continue with the research plan?
    - Researchers and research plans are being evaluated in the future and hence a better strategy is to be realistic in terms of what one is asking for. Concentrate on what you can do rather than what you couldn't do in the past due to illness, maternity etc.,
    - Another common mistake researchers make is not providing a time frame. So without a timeframe, the evaluation group really cannot assess the impact. If the issue is on-going that affects your ability to perform then you must talk to NSERC about it and be truthful about what it is and the impact is. Because, there are various mechanisms to extend current grants with or without funds, so that might be a direction to investigate.
    - If there is a period of delay, then NSERC would only evaluate during the active period.
    - If one becomes Dean or Chair or accepts an administrative responsibility during the life of an active grant etc., that is deemed to be a personal choice and it cannot be used an excuse for claiming any credit for delays.
    - Committees are not allowed to speculate about illnesses, health, gender etc., so it's important to provide as much information as possible with regard to your case, so they can make an informed and rational decision.

9. If a researcher has been in the field for over 10 years or so and has had remarkable achievements, should that be mentioned in the application? Where should one mention about it?

    Yes, the researcher should mention it and put it across in a way to showcase that it has had impact on the 6 year window during the time of application. It could be mentioned in one of your top 5 most significant contributions. The publication could be old but the impact is new and high. Just keep it to a minimal but worth mentioning such achievements.

Highly Qualified Persons (HQP):

10. How can one justify that every undergrad would become a co-author?
    - Use the HQP section to elaborate on how you contribute to your HQP becoming successful, emphasize on which papers they were co-authors on and what was their contribution vs your contribution to the research.
    - You need to explain how these students whether undergrads, masters, post docs in whatever role they are, have achieved the outcomes that are expected of them and how you have facilitated or made that happen.

- It is also advisable to track your students what they are doing after they leave your lab for ex: ask them to ask them to create a Linked In profile and have them update it, so you can see their progress. That way you can look back and see where they are and make a story out of that.

11. When it comes to HQP, is it possible to share applications with outstanding HQP scores and make it available for researchers at Dalhousie, so we can benefit from it?
    - We could request researchers to do and ask them to share their HQP scores – In the process.
    - Work on obtaining 1 peer reviewer from within the field and one who is not, to get an all-rounded review and get feedback from 2 different perspectives.

12. Is impact over a length of time better for success rates in applications? Having a successful and diverse lab does not necessarily mean a successful application.
    - The committee can only evaluate your HQP based on what you have written and that relates to your plan and past involvement. You need to do your best to accentuate those points. Have you published with this HQP or have they been co-authors in your publications etc.,
    - Should students from other universities as interns and co-supervisors etc., be listed in the HQP section?

    The answer is yes, they should be listed. In fact it reflects well on the common CV as being able to have those connections from people from different universities and sharing the same research interests. It's also a way to demonstrate the value of EDI to their respective research groups. It's good to write it down in a short way in the application.

General:

13. In cases where natural sciences and engineering are not specifically targeted but it includes a research project that includes all faculties, staff and students, are such projects likely to be eligible?

    As long as Natural Sciences and Engineering are a part of a larger project, then yes, it is considered eligible.

14. Is it only 1 application per PI for the **RTI** competition this year?

    Yes, a researcher can be either PI or Co-Pi on only one application for the RTI program.

15. What is the eligibility and criteria for evaluating Discovery Accelerator Supplements (DAS) applications? Is the evaluation process the same whether a DAS application or not?

    If you are already on the international arena as a world class researcher and are completely changing fields then you become eligible for DAS. The criteria is - The work has to excite the evaluation group members and then the evaluation group members

vote for the DAS application and score and then executive committee rank the DAS applications. So the criteria is either you have to be at the cusp of the emerging into the international arena or you have to already be there with an exciting project.

Tip: Successful projects -

In terms of a proposal in general, the proposal could be in 3 sections:

Section 1: Talk about projects you have got on the go, projects what you have had some success on so far and write about how you plan to conclude them and also mention the impact.

Section 2: A portion on new ideas but fairly grounded ideas.

Section 3: A portion on what is out there. But this piece needs to be feasible and feasible by your environment.

If you have any questions about NSERC Discovery Grant and RTI applications, please contact Laurent Kreplak at kreplak@dal.ca or David Spurrell from Dalhousie Research Services at david.spurrell@dal.ca.

Q&A June 2017

1. **Excellence of Researcher**
Q: Re: productivity, they used to look at how you use NSERC funds. Now, it seems to be all publications – is that the case?
A: Focus of EG is on contributions to natural sciences and engineering (NSE) – in general, the entire record is considered, not just NSERC funding
A: Meant as grants-in-aid, so can show how it fed into productivity, but must explicitly state that, and how, the NSERC grant helped acquire another source of funding

Q. There is difficulty being published in high-impact journals: what qualifies as high impact? How to best present reasons for choosing these journals? How does EG see open-source journals (must pay to publish, but open access, thus wide reach and impact)
A: The onus is on the applicant to make case for where he/she is publishing
A: The EG has to judge the quality of the application against *the grid* (scroll below to refer to the grid and the peer review manual) which describes which types of achievements form criteria for strong, very strong, etc; this grid points at "in comparison to the community", i.e. that particular EG's community, so if the EG members think open access is fine, then it is – so if you think more people can benefit from your work, then say so – not specifically asked for, but give it! Why you publish where you do is asked, and you can pull in other initiatives ongoing in your lab – think about the Natural Sciences and Engineering (NSE) program, rather than your entire program.

Q: Where is this grid available?

A: On the NSERC website – instructions to EGs "peer-review manual", good tool for self-evaluation
A: Valuable for all 3 prongs of evaluation. EG only considers the application in front of them. Excellence refers to the NSE program, and to the community. Up to you to convince them that they are in NSE, especially in cases where all journal articles may be, on their face, in some other area. In Computer Science, for example, EGs have seen 50+ publications listed, but if not counted as NSE or unknown to the EG members, they don't help. Fewer papers in high-impact journals are more effective than many unrelated items.

Q: If some of your research includes arts, how is this viewed by the committee?
A: This is a rare occurrence. As a rule of thumb, 80% of your program must be within the NSE and the remaining 20% can include arts or other non-NSE components. Program must be based in NSE. That's how NSERC thinks of it – frame it so that it fits within that.

2. **Merit of Proposal**
Very simply: the only thing you have any control over when you write your proposal. It's too late to acquire more students or publications. Given your experience, what can you do? The time to start working on your proposal is now (June).

Q: How to balance program versus detail? If too much detail, we are told that NSERC doesn't fund projects, they fund details. If too general, we are told that there is not enough information.
A: Do both. General program and specific projects that will realize that vision – they are not disconnected. Core proposal: give vision and highlight individual projects, then complete the picture in HQP. Work on your proposal early to allow your colleagues to review.
A: Biggest complaint of proposals is lack of detail. Describe half big picture, half specifics.
A: Within topics, are projects, so start with a general introduction and then go into detail of projects. Often 3-4 topics: ongoing and successful, new, new and risky… note that NSERC does not fund continuation of research.
A: There are 5 EGs, and if you're lucky, 2 are in your field, but all 5 contribute equally to evaluation. Use words that a non-expert can understand. The more people you can draw into understanding, the higher you are likely to be voted. The median is used – so top 2 and bottom 2 votes omitted.
A: Draw in all 5 EG members. Make your proposal easy to read, don't waste their time.
A: Re: median score: 1st reader presents the file (having read it well), then after 15 minutes a vote is taken. All are told the outcome. So, if anyone feels the vote reflects an unfair assessment, they can call for a revisit and head back to square 1. So, if a there is huge spread, then they are likely to revisit – this is a correction mechanism in the system. EG are not looking for things wrong, they are looking for things right. Highlight what you did with what you had.

Q: Grid: where is cut-off line of funded vs not funded?
A: Typically "strong" is funded, sometimes bin J is funded, sometimes, not. The EG does not know at the time. Focus of EG review is not the amount, or funded/not funded, but fairly assigning applications to a bin. Section Chair and Group Chair work with Program Officers to assign values to bins – continuity is important. They also look at HQP. Bins do get split based on ECR vs established researchers.

Q: The amount of funds that NSERC receives each year is different. Where do we sit this year?

A: EG members and chairs are not involved in that – they just implement guidelines. That said, NSERC having higher allocation of funds does not necessarily translate to higher grant amounts. This depends on the number of applications, amongst other factors.

Q: Is it wise to put in a post-doc to raise the budget to still get funded on a lower bin?
A: Budget doesn't get discussed much. Be sensible, and air on the high side – NSERC does not give you more than you ask for. Budgets are only discussed if flagged; goal of budget is to stabilize feasibility aspect. Ensure consistency with other sections of proposal.

Q: If someone doing well has lower current funding, shouldn't they be getting more from NSERC?
A: Although the EG can view your currently held funding on your CCV (by doing the math), make it explicitly clear. CCV shows level of funding – so a reviewer could see this and have an unconscious bias. It is not discussed in EG. Committee cannot apply mathematical approach to previous funding vs: output, but there is inevitably some internalized, individual consideration.

Q: Is there any memory around the table?
A: No, zero. Previous description of unfunded projects should NOT be included, addresses negative things! Past consideration is only discussed after the bin is assigned – although whoever writes to the applicant afterwards is informed of previous results to ensure an appropriate reply. It is positive, however, to include previous comments if used to address how you improved the grant.

Q: Addressing previous comments. How much do you adjust your proposal? The EG is not same composition, and may not agree with previous comments to begin with.
A: Personally, I wouldn't address it at all. Brings out a negative, could create bias. You can address comments without explicitly acknowledging that it wasn't good enough last time.
A: There is a calibration process in place, so in theory, any committee should come to the same score. Message to Applicants (MTA) contains valuable information – if they are bothering to give comments, they are sure to make it valuable. BE POSITIVE!

Q: Can each panelist briefly comment on one thing that impresses you the most about an application, and one that turns you off?
A: Easy to read. The first referee has to summarize entire application into 2-3min, so use key phrases that can result in a coherent 1-page summary to the rest of the EG.
A: Don't make your reviewers think! Don't make it a project for them!
A: Worst thing: strong researcher with no effort into proposal; Best: use headings to organize your work, use free-form sections to be organized and relay every possible positive point
A: Summary is very important – try not to reiterate the first 3-4 sentences from introduction
A: Spend time on them
A: Cohesiveness: tie your sections together so that it can be read as one document. Who you are, what you do, what you'll do with the funds – tell a story.

3. **Highly Qualified Personnel (HQP)**

Q: Earth Sciences is particularly affected by lower number of HQP – EG is not allowed to use the number of HQP, but it will not be considered an outstanding level if much lower than average – there is comparative ranking. How can applicants best remedy this?
A: It is not a good idea to be negative in your proposal, such as "I could have done better if…" – but find a way to say the same thing in a positive light. Positively explain the challenges you face, and cancel out the deficit in number by explaining their impact.
A: Also highlight the impact of your trainees – use the free-form sections to describe this. Quality is much more relevant than quantity.
A: Training program: spell out how you plan to train them. Many institutions without graduate programs are disadvantaged, but this is not fatal to your application. Many undergrads vs many graduate students is not necessarily a bad thing if you can really highlight what they learn.
A: Each of these 3 criteria are equally weighted, so put in just as much time to HQP, lots of space to discuss HQP in the past, and must be done in highest possible caliber. If there is any discussion amongst committee of the applicant being from smaller institution, the chair shuts it down. Fill the entire section – use up all the space.
A: To fill the pages: describe not just a philosophy, put a PLAN! How many students on which project, show your effort and organization

Q: Undergrads: how far back can you go? Can you mention students outside the 6-year window?
A: Yes you can mention it, but be careful to also mention current people. No reason not to do so.
A: BUT, in some cases, free-form on HQP pulls out only out-dated students, and the committee will see that. So yes, slip some in, but also focus on folks inside the 6-year window.

Q: How former HQP are doing: are they only considered successful if continuing in the same field?
A: Yes and no – onus is on the applicant to link the training experience with their current outcomes. I.e. what skills did you help them develop? Not necessarily direct, so you must point it out. Committee can't make these connections, but you can do so for them.
A: Bring up their trajectory, focus on the link through their professions.

Q: How does HQP ranking work for junior faculty members? NSERC uses the term "early career researchers" (ECR), within 3 years of academic appointment
A: Going back to the grid, you will be evaluated the same as someone 25 years your senior. EG looks at your plan very closely, even if no track record, you will be marked as "moderate". Often ECR are funded at lower bin levels. Put a lot of effort into your plan.
A: Spend a lot of time crafting this and getting feedback from your peers. Play up any mentoring experience in your past, e.g. Post-Doc working with Masters students, supervising, etc.
A: This also links to your proposal. It is scored separately, but the HQP are the ones doing the work in your proposal. Sprinkle your proposal into HQP and vice versa. "Feasibility" is vital.

Q: (early career researchers and HQP): an ECR shared: I mentioned people I mentored as a sessional professor (46 interactions) – but consequently looked like a highly experienced applicant, so was evaluated as an established researcher. Shot myself in the foot. How can I get around this?
A: Talk to the scientific officer for your EG and find out why. Might be due to other reasons. Categorization is independent of HQP, dependent on type of appointment, and other factors.

Q: if NSERC enables you to get another grant, how do you best describe this in your application?
A: State that you used it to get more funds!
Q: But where to categorize?
A: Under “excellence of researcher”

DISCOVERY GRANTS MERIT INDICATORS[1]

	Exceptional	Outstanding	Very Strong	Strong	Moderate	Insufficient
Excellence of the Researcher	Acknowledged as a **leader** who has continued to make, over the last six years, **influential accomplishments** at the highest level of quality, impact and/or importance to a **broad community**.	The accomplishments presented in the application were deemed to be **far superior** in quality, impact and/or importance to a **broad community**.	The accomplishments presented in the application were deemed to be of **superior** quality, impact and/or importance.	The accomplishments presented in the application were deemed to be **solid** in their quality, impact and/or importance.	The accomplishments presented in the application were deemed to be of **reasonable** quality, impact and/or importance.	The accomplishments presented in the application were deemed to be **below an acceptable level** of quality, impact and/or importance.
Merit of the Proposal	Proposed research program is clearly presented, is **extremely original and innovative** and is **likely to have impact by leading to groundbreaking advances** in the area and/or **leading to a technology or policy** that addresses socio-economic or environmental needs. **Long-term vision** and **short-term objectives** are **clearly defined**. The methodology is **clearly defined and appropriate**. The application **clearly demonstrates** how the research activities to be supported are distinct from those funded (or applied for) by other sources.	Proposed research program is clearly presented, is **highly original and innovative** and is **likely to have impact by contributing to groundbreaking advances** in the area, and/or **leading to a technology or policy** that addresses socio-economic or environmental needs. **Long-term goals are clearly defined and short-term objectives are well planned**. The methodology is **clearly described and appropriate**. The application **clearly demonstrates** how the research activities to be supported are distinct from those funded (or applied for) by other sources.	Proposed research program is clearly presented, is **original and innovative** and **is likely to have impact by leading to advancements** and/or addressing socio-economic or environmental needs. **Long- term goals are defined and short-term objectives are planned**. The methodology is **clearly described and appropriate**. The application **clearly demonstrates** how the research activities to be supported are distinct from those funded (or applied for) by other sources.	Proposed research program is clearly presented, is **original and innovative** and is **likely to have impact** and/or address socio-economic or environmental needs. **Long-term goals and short-term objectives are clearly described**. The methodology is **described and appropriate**. The application **clearly demonstrates** how the research activities to be supported are distinct from those funded (or applied for) by other sources.	Proposed research program is clearly presented, has **original and innovative aspects** and **may have impact** and/or address socio-economic or environmental needs. **Long-term and short- term objectives are described**. The methodology is **partially described and/or appropriate**. The application **clearly demonstrates** how the research activities to be supported are distinct from those funded (or applied for) by other sources.	Proposed research program, as presented **lacks clarity**, and/or is of **limited originality and innovation**. **Objectives are not clearly described** and/or likely not attainable. Methodology is **not clearly described and/or appropriate**. The application **does not clearly demonstrate** how the research activities to be supported are distinct from those funded (or applied for) by other sources.
Training of HQP	Past training is **at the highest level** in terms of the research training environment provided and HQP contributions to research. **Most** HQP move on to **highly impactful** positions that require skills gained through the training received. Training philosophy and research training plans are **at the highest quality**: **highly appropriate, clearly defined** and expected to produce **top quality** results in terms of the overall approach and specific projects for HQP.	Past training is **far superior** to other applicants in terms of research training environment provided and HQP contributions to research. **Most** HQP move on to **impactful** positions that require skills gained through the training received. Training philosophy and research training plans are **far superior**: **highly appropriate, clearly defined** and expected to produce **high quality** results in terms of the overall approach and specific projects for HQP.	Past training is **superior** to other applicants in terms of the research training environment provided and HQP contributions to research. HQP **generally** move on to **impactful** positions that require skills gained through the training received. Training philosophy and research training plans are **superior**: **highly appropriate**, **clearly defined** and expected to produce **quality** results in terms of the overall approach and specific projects for HQP.	Past training compares **favourably** with other applicants in terms of the research training environment provided and HQP contributions to research. HQP **generally** move on to positions that require skills gained through the training received. Training philosophy and research training plans are **appropriate** and **clearly defined** in terms of the overall approach and specific projects for HQP.	Past training is **modest** relative to other applicants in terms of the research training environment provided and HQP contributions to research. **Some** HQP move on to positions that require skills gained through the training received. Training philosophy and research training plans are **partially appropriate** and **partially defined** in terms of the overall approach and specific projects for HQP.	Past training is **below an acceptable level** in terms of the research training environment provided and HQP contributions to research. HQP **rarely** move on to positions that require skills gained through the training received. Training philosophy and research training plans are **not appropriate** and **not clearly defined** in terms of the overall approach and specific projects for HQP.

[1]The Discovery Grants Merit Indicators should be used in conjunction with the Peer Review Manual which outlines how reviewers arrive at a rating.

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DISCOVERY GRANTS PEER REVIEW MANUAL

2017-18

Discovery Grants Peer Review Manual 2017-18

Foreword

This manual is designed as a guide for Evaluation Group members for the Discovery Grants program. It outlines activities to be undertaken by members, section chairs, and group chairs and describes the policies, guidelines, and deliverables relevant to these activities. The manual is updated every year.

Applicants who refer to this manual should note that the content is intended to guide peer reviewers and outline principles rather than provide them with a set of rules.

For more information regarding Discovery Grants program, policies, and guidelines contact the applicable program officer.

The evaluation of applications in Subatomic Physics differs from these guidelines and is described in the current internal procedures of the Subatomic Physics Evaluation Section. For more information, contact the Subatomic Physics program officer.

Contents

1. Discovery Grants program

1.1 Program objectives

Discovery Grants assist in:

- promoting and maintaining a diversified base of high-quality research capabilities in the natural sciences and engineering (NSE) in Canadian universities;
- fostering research excellence; and
- providing a stimulating environment for research training.

1.2 Program description

The Discovery Grants Program supports ongoing programs of research with long-term goals rather than a single short-term project or collection of projects. These grants recognize the creativity and innovation that are at the heart of all research advances. Discovery Grants are considered 'grants in aid' of research as they provide long term operating funds and can facilitate access to funding from other programs. They are not meant to support the full costs of a research program.

As NSERC's largest program, the Discovery Grants Program is a major source of funding for NSE research at Canadian universities and constitutes the foundation of a large part of Canada's research effort. Discovery Grants are investments in the research training and activities of individuals working at the frontier of science and engineering.

Recipients of Discovery Grants are not restricted to the specific activities described in their application and included in their budget proposal, and may pursue new research interests as they arise, provided these are within NSERC's mandate and adhere to the accepted use of grant funds documented in the *Financial Administration Guide*. This provides researchers with the flexibility to pursue promising research avenues as they emerge and the opportunity to address higher-risk (higher reward) topics. Discovery Grants are awarded to individual researchers, who can use their grants to participate in collaborative efforts.

1.3 Nature of research supported

Research in the NSE encompasses a broad spectrum of activities. These activities range from curiosity-driven investigations with no immediate or even midterm application, as their importance stems from the intellectual structure of the discipline, right up to applied research or solutions to problems suggested by social and industrial needs. The Discovery Grants program is open to activities across the entire spectrum. The program aims to foster activities that position Canada as a participant and leader in global science and engineering. In this sense, it can be both a flexible resource for Canada and create a favourable environment for the development of research personnel.

Increasingly, research on the most significant problems in the natural sciences and engineering

requires the combined knowledge, expertise, and contributions of many researchers, often from various disciplines. Creativity and innovation are at the heart of all research advancements. NSERC strives to fully value the role of collaborative endeavours and interdisciplinary work as a means to greater achievement in research through the peer review system.

1.4 Subject matter eligibility

NSERC supports research whose major challenges lie in the natural sciences and engineering (NSE), other than the health sciences, which could eventually lead, among other applications, to the treatment or prevention of human disease. Therefore, research primarily in the NSE that advances NSE knowledge is eligible for support, even though it may have potential future applications in human health, such as diagnosis or treatment. Proposals that include the use of methodologies, tools, techniques and knowledge from the NSE are not automatically considered eligible.

For the Discovery Grants Program, decisions on subject matter eligibility (SME) are the responsibility of NSERC staff. The review of SME is done independently from the peer review assessment. To determine whether work contributes to the NSE or not, reviewers are asked to consider the Tri-Agency (CIHR, NSERC, and SSHRC) document Selecting the Appropriate Federal Granting Agency and the supporting Addendum to the Guidelines for the Eligibility of Applications Related to Human Health. Members who have doubts as to whether the research proposed is eligible for support by NSERC must inform NSERC staff of the potential concern as soon as possible. While NSERC aims to identify these cases early in the review process, decisions on ineligibility due to SME can be made at any stage of the review process.

2. Membership

2.1 Overview

The review of Discovery Grant applications is achieved using a conference model peer review structure. Expert scientists and engineers from academia, industry, and government form the membership of twelve discipline-based Evaluation Groups (EGs), providing quality assessment and funding recommendations for applications assigned to them.

The EGs have full responsibility for the evaluation of applications assigned to them according to policy guidelines established by NSERC. The section chairs, group chairs, and NSERC staff work together to monitor the quality of review and to develop and refine policy.

2.2 Membership selection process

New members are appointed every year. Potential new members can be established researchers or early-stage scientists and engineers from universities, government, or industry. Potential new members are approached by program officers regarding their willingness to serve on EGs; they need not be NSERC grantees.

Past members may be approached by program officers to provide recommendations and

references for potential new members. These recommendations can include comments on the background, stature, and experience of nominees, as well as references on their suitability to participate in the peer review process and work in a committee setting. Factors such as the nominee's involvement in collaborative and interdisciplinary research may also be considered. In making suggestions for membership, the recent history and current membership of the EG is taken into account.

To learn more about the selection of EG members consult the Guidelines Governing Membership of Selection Committees.

The following documents must be read and agreed to by all members of NSERC's EGs, selection committees, or panels upon appointment and on an annual basis thereafter:

- Conflict of Interest and Confidentiality Agreement for Review Committee Members, External Reviewers, and Observers
- Conflict of Interest and Confidentiality Policy of the Federal Research Funding Organizations

Acceptance of a term as a member brings with it a commitment to participate in the evaluation of applications assigned to an EG within guidelines established by NSERC. Members, section chairs, and group chairs must adhere to NSERC policies and guidelines including those on conflict of interest, diversity and gender equality, communication with applicants, and confidentiality.

2.3 Roles and responsibilities

2.3.1 Members

Members participate in the evaluation of Notifications of Intent to apply (NOI) and full applications, and make recommendations to NSERC based on their assessment. Specific responsibilities of members include:

- participating in preparatory meetings/discussions and information sessions prior to the peer review meetings;
- submitting comfort ratings for the NOI and the full applications;
- providing input on assignments (e.g., joint reviews);
- suggesting external reviewers for applications where they are assigned first internal reviewer;
- reading all assigned application material according to their role;
- participating in deliberations, either in person or virtually;
- presenting in-depth evaluations for the applications assigned to them as first and second internal reviewer;
- identifying potential Discovery Accelerator Supplement (DAS) nominees;
- voting on all assigned applications; and
- preparing messages to applicants that reflect the group's assessments and recommendations.

2.3.2 Section chairs

Section chairs (also referred to as co-chairs) provide leadership to ensure the orderly and complete evaluation of applications and the transmission of accurate recommendations to NSERC. Within each EG, there are multiple section chairs who often represent different sections or research streams. In addition to their commitments as a member, their responsibilities include:

- leading efforts to maintain a high quality peer review process;
- ensuring a consistent and equitable approach during the peer review meetings;
- ensuring that all important aspects of applications are considered and comprehensively discussed;
- assisting with the preparation of messages to applicants;
- participating on the EG executive committee;
- contributing to discussions on policy issues, new emerging areas of research, particular discipline concerns;
- providing input on the EG's annual report; and
- participating in the discussions of the membership for the following year.

2.3.3 Group chairs

There is one group chair for each of the twelve EGs. Group chairs are not considered members of the EGs under their purview and do not review or vote on applications. However, they are members of the Committee on Discovery Research (CDR). In this capacity, they act in the best interest of all areas of the natural sciences and engineering, while bringing to the discussion their particular knowledge of specific disciplines. While the group chair's role is associated with disciplines close to their own field of expertise, they are encouraged to familiarize themselves with other discipline-specific issues or dynamics. Specific responsibilities also include:

- monitoring the quality and consistency of peer review in the EG under their responsibility;
- advising members on NSERC policies and procedures;
- participating on the EG executive committee;
- monitoring the effect of the budgetary situation on success rates;
- reviewing the research topics and disciplines covered by the EGs and recommending changes as appropriate;
- representing opinions and concerns of the EG related to the peer review process to CDR and to NSERC;
- preparing the EG's annual report with NSERC staff; and
- participating in the discussions regarding the membership for the following year.

2.3.4 NSERC staff

NSERC staff are not EG members and do not vote on applications. Staff oversee membership, provide advice on NSERC policies, guidelines, and procedures and help ensure consistency in the evaluation of all applications submitted to the Discovery Grants Program.

2.4 Information sessions and meetings

Throughout their term, members are required to attend a number of information sessions and meetings. Depending on the EG and discipline, the frequency, format, and lengths of these meetings will vary. Where possible, meetings are combined to make optimal use of members' time. An overview of the information sessions and meetings is highlighted in the sections below.

2.4.1 Orientation sessions

An orientation session for members is typically held near the end of August or early September, once the membership slate has been approved. This session provides an opportunity for new members to ask questions and to familiarize themselves with NSERC policies and guidelines for the review of applications.

A second orientation session is held for all EG members, section chairs, and the group chair typically in late November or early December. The purpose of this session is to provide information on NSERC policies and guidelines, best practices, and provides an opportunity for members to ask specific questions. Often, this session includes more details surrounding the review process and a preliminary calibration session.

Orientation sessions are held virtually, by teleconference or video conference.

2.4.2 Calibration session(s)

Calibration session(s) are held prior to and/or on the first day of the peer review meetings. These sessions provide all members the opportunity to standardize their reviewing principles. Calibration sessions include a mock review of a selection of applications with the objective of familiarizing members with the peer review meeting process, the evaluation criteria, and the Discovery Grants Merit Indicators. These sessions also help to achieve the highest level of consistency among members within the EG on interpretation and use of the ratings.

2.4.3 Peer review meetings

The EG members, section chairs, and group chair participate in the peer review meetings (also referred to as 'competition weeks') in person in Ottawa, Ontario (Canada). These meetings take place over three weeks each year (usually in February). For each EG, this involves an in-person meeting of up to one week; however, some members may participate virtually. Activities that take place during the peer review meetings include calibration sessions and deliberations.

Some members may be asked to participate in joint reviews with other EGs that take place during the two weeks they are not in Ottawa. For these deliberations, members participate virtually.

Travel and living expenses of members, while on NSERC business, will be reimbursed by

NSERC. Members will receive details on travel arrangements prior to the peer review meeting.

2.4.3.1 Deliberations

During the three weeks of peer review meetings, members discuss and vote on all assigned applications. Each application is allocated fifteen minutes for deliberation and voting. An important consideration for making the conference model work is adhering to EG schedules. Section chairs and program officers must ensure that discussions proceed at a rate that will allow the EG to get through its work within the time available. Members must be aware of this while preparing and presenting.

2.4.4 Policy meeting

EGs may hold a policy meeting following the completion of their review of applications. Possible topics include a discussion of NSERC administrative processes, policies, forms, membership, budget, and literature. In addition, feedback from the EG may be sought on policy matters currently under review at NSERC.

2.4.5 Executive committee meeting

The group chair and sections chairs are members of the executive committee for each EG. The executive committee meets following the evaluation of all applications. In consultation with NSERC staff, each EG's executive committee conducts an analysis of the overall ratings and funding bins, makes a recommendation for budget distribution, and finalizes the ranking of the Discovery Accelerator Supplements nominations. Executive committee members' feedback on the peer review meetings and policy is also discussed.

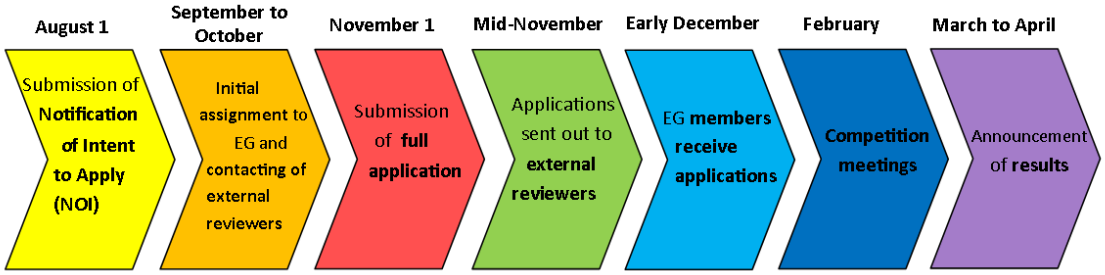
2.5 Time commitment

Participation of experts in the peer review of Discovery Grant applications is crucial to the success of the program; serving in this capacity involves a significant time commitment. Contributing as a member in a peer-review evaluation group demands periods of intense activity that may compete with regular responsibilities. In general, a member's preparation for the peer-review meetings involves the following:

- in-depth reading of those applications and external reviewer reports where assigned as internal reviewer;
- reading all other applications and external reviewer reports where assigned as reader;
- identifying potential Discovery Accelerator Supplement (DAS) nominees;
- preparing notes on applications assigned as internal reviewer;
- arriving at preliminary ratings for each of the three selection criteria;
- arriving at preliminary recommendations for the cost of research (high or normal), where applicable; and
- preparing draft comments for cases where there is a recommended rating of *Moderate* or *Insufficient*, or where a message would particularly benefit an applicant.

The time required for this preparation is substantial. It is strongly recommended that an appropriate amount of time is set aside for the thorough review of all applications, recognizing that a more in-depth analysis is required for first and second internal reviewer assignments.

3. Review Procedures



3.1 Application assignment

3.1.1 Evaluation Group assignment

At the Notification of Intent to apply (NOI) stage, applicants to the Discovery Grants Program are asked to suggest an EG, as well as research topic(s) that best reflect the subject of their proposal. In most cases, the suggested EG is maintained, however members may suggest that the EG be changed if appropriate. The final decision resides with NSERC. The research topics are chosen by the applicant and identified along the lines of discipline groupings, and accordingly labelled (e.g., PHYS for Physics). Applicants can select Research Topics from more than one EG. These are reviewed when considering the need for joint reviews.

3.1.2 Joint reviews

When applications cross the boundaries of two or more EGs, measures such as a joint review can be undertaken to ensure fair evaluation. Joint reviews occur when members with needed expertise from other EGs participate in the review of an application. Members and NSERC staff identify NOIs where a joint review with another EG may be useful. Potential applications that would benefit from joint review are discussed with the section chairs and group chairs at the NOI stage. Final decisions on joint reviews may occur after the receipt of full applications.

3.1.3 Assignment of internal reviewers

In order to aid in the assignment of reviewers, members are asked to provide their comfort levels (level of expertise) for the NOIs received by the EG. Comfort levels include high (H), medium (M), low (L), very low (VL), cannot review due to language proficiency (X), or conflict of interest (C).

NSERC staff, in collaboration with the executive committee members, use the identified comfort levels, information about possible conflicts of interest, consideration of linguistic

abilities, and the need to balance workload to finalize the assignments of the internal reviewers and readers to each application.

Near the end of November or early December, each member is provided with the final list of applications that they are responsible for reviewing, and their role for each application is indicated (first reviewer, second reviewer, or reader). Note that members may be asked to review applications that are not in their primary research field. In such cases, the member is usually assigned as a reader. Members are responsible for preparing an assessment for each application assigned to them and should be ready to discuss and vote at the peer review meetings regardless of their role.

Members should advise NSERC if they think that an application may have been improperly assigned to them (i.e., if they have a conflict of interest, do not have the appropriate expertise or linguistic capability to review the proposal, etc.) or if they find that it would particularly benefit from a joint review. Any problem with assignment of applications should be brought to the program officer's attention as soon as possible. In exceptional circumstances, issues with the assignment of an application can be flagged as late as the peer review meetings.

3.1.4 Internal reviewer roles

Each application is assessed by five members with different roles; first internal reviewer, second internal reviewer, and three readers. All assigned members, regardless of role, are expected to participate in the deliberations and vote.

The **first internal reviewer** identifies potential external reviewers, carries out an in-depth review of the application and the external reviewers' reports. During deliberations, the first internal reviewer leads the presentation of the application and makes a rating recommendation for each of the three selection criteria.

The **second internal reviewer** also carries out an in-depth review of the application and the external reviewers' reports. During deliberations, the second internal reviewer follows up on the presentation made by the first internal reviewer and makes a rating recommendation for each of the three selection criteria.

Readers carry out a review of the full application and external reviewers' reports. They participate in the deliberations and make rating recommendations for each of the three selection criteria.

3.1.5 Selection of external reviewers

Input from external reviewers is an important part of the peer review process. During deliberations, internal reviewers present and discuss external reviewer reports that have been received for an application.

The first internal reviewer is responsible for identifying potential external reviewers from the applicant's suggestions in the NOI and their knowledge of the community, while

watching for conflicts of interest and linguistic ability. NSERC may seek additional suggestions based on the responses received.

NSERC strongly recommends that members use a cross-section of reviewers with expertise in the applicant's area of research (i.e., international and Canadian reviewers, from early career to established researchers, as well as from academic and non-academic institutions).

External reviewers must have the appropriate expertise to comment with confidence and the linguistic ability to review the application. Two reviewers from the same institution or department should not be selected to review the same application. Current EG members cannot be selected as external reviewers. In addition, applicants to the current Discovery Grants competition cannot be selected as external reviewers for applications in the same EG.

Members are also asked to consider the following guidelines when selecting external reviewers:

- The best possible external reviewers for each application (i.e., those closest to the specific field(s) of research who are likely to provide a comprehensive, unbiased, and critical review) should be selected.
- A variety of external reviewers for different applications should be suggested by members. To ensure that the same reviewer is not contacted repeatedly, NSERC tries not to assign more than three proposals for review to any given external reviewer. Members can help with this process by not suggesting the same reviewer too many times.
- For interdisciplinary research, members should ensure that the external reviewers selected have (individually or collectively) expertise in all the relevant disciplines and aspects of the proposal.
- Members should not rely solely on the list of external reviewers suggested by the applicant. Names suggested by the member as well as names from the applicant's list (typically two), if appropriate, should be included.
- A minimum of two external reviewers whose first official language is the same as that used in the application should be selected.

External reviewers must strictly comply with the Conflict of Interest and Confidentiality Agreement for Review Committee Members, External Reviewers, and Observers.

3.2 Applications and review material

3.2.1 Incomplete or non-adherent application

The onus is on the applicant to provide complete and sufficient information that adheres to NSERC General Presentation Guidelines and Instructions for Completing an Application. Problems related to the application content should be brought to the attention of the program officer. In order to maintain the principle of fairness in the competition, applicants must adhere to the guidelines in the preparation of application materials. Should NSERC staff determine that the information provided is incomplete or non-adherent to NSERC guidelines or instructions, the application may be rejected.

3.2.2 Eligibility of applicants

Eligibility decisions are the responsibility of NSERC staff. Members who have doubts as to a researcher's eligibility should review the application on the same basis as all others, and should alert NSERC staff to the potential problem(s) as soon as possible. The eligibility criteria for applicants can be found in the Eligibility section of the NSERC website.

3.2.3 Applicant categories

Applicants to the Discovery Grant program are categorized as either Early Career Researchers (ECR) or Established Researchers (ER).

a) Early career researchers (ECR) are applicants who have held an independent academic position for 3 years or less and who meet the eligibility criteria for faculty at the time of submitting the Notification of Intent to Apply for a Discovery Grant (NOI). For example, to be classified as an ECR, a researcher submitting an NOI in August 2017 would have been hired in or after July 2014.

b) Established researchers (ER) are applicants who have held an independent academic position for more than 3 years and who meet the eligibility criteria for faculty at the time of submitting the Notification of Intent to Apply for a Discovery Grant (NOI).

An independent academic position is a position that:
- is a university faculty appointment (tenured or non-tenured); and
- requires that the researcher engages in research that is not under the direction of another individual; and
- authorizes the researcher to supervise or co-supervise the research of students registered in an undergraduate or graduate degree program, or postdoctoral fellows.

Applicant categorization is the responsibility of NSERC staff and is based on the information provided by the applicant in the NOI, Canadian Common CV (CCV) and full application. Members can contact NSERC if they have questions about the classification of an applicant.

3.2.4 Review materials

In early December, members will have access to the application material. Throughout January and February, external reviewer reports will become accessible. The following information will be available for members in a secure electronic environment:

- Instructions given to applicants on how to prepare an application;
- Discovery Grant applications; and
- Rating forms for Discovery Grant applications.

NSERC provides members with a rating form to help with the process of reviewing applications. The rating form focuses on the selection criteria and allows members to integrate, where

appropriate, external reviewer comments and other relevant information (e.g., delays in research). The rating form is provided only as a tool to help ensure that all three selection criteria are taken into account when formulating preliminary ratings.

Members are reminded that according to the Conflict of Interest and Confidentiality Agreement for Review Committee Members, External Reviewers, and Observers, they must ensure that review documentation is stored in a secure manner to prevent unauthorized access. When no longer required, review documentation must be destroyed in a secure manner.

4. Evaluation of Applications

4.1 Overview

Discovery Grant applications are assessed on the basis of the following three, equally weighted, selection criteria:

- Scientific or engineering excellence of the researcher;
- Merit of the proposal; and
- Contributions to the training of highly qualified personnel (HQP).

Based on the scoring outcomes of these three selection criteria, applications are grouped into 'bins' of comparable merit. The assessment of each criterion is based on the achievements demonstrated by the applicant over the past six years.

The evaluation is based only on the information contained in the review material provided. Members must not research or access additional information about publication status, other funding requests, prizes, HQP outcomes, or impact factors that are not included in the review material.

4.2 Merit indicators

The Discovery Grants Merit Indicators are a scale of qualifiers that contain statements with reference to major points of consideration, to guide members towards arriving at a rating for each selection criterion.

All applicants, both early career and established researchers, are evaluated using the same merit indicators. Members are encouraged to use the full range of quality ratings, as appropriate, to achieve a distribution of ratings that reflects the quality of the applications being evaluated. Members are expected to discuss and justify their ratings during the peer review meeting. Following discussion, members vote on a rating that corresponds to the indicator which best reflects their complete assessment for a given criterion.

Members must make every effort to review applications without bias; biases based on schools of thought or approaches, fundamental versus applied research, certain sub-disciplines or areas of research, size or reputation of an institution, personal factors, age, sex or gender of the applicant should not influence an assessment.

4.3 Distribution of ratings

The Discovery Grants Merit Indicators are absolute in that they refer to the entire research community. Merit indicators are expected to be interpreted the same way from one competition year to the next. The weakest application in a year of truly remarkable applications is not automatically given a rating of *Insufficient*. Similarly, the best application in a year where the overall cohort is not as strong is not automatically *Outstanding* or *Exceptional*. EGs calibrate the use of the merit indicators through various opportunities prior to the peer review meeting.

4.4 Selection criteria

Several elements are considered in the evaluation of each selection criterion. Details are provided below for instances when failure to sufficiently address a specific element can warrant a rating of *Insufficient* for the criterion. There is no prescribed weighting of elements within any criterion. Evaluation Group members should use their expertise and judgment in conjunction with the merit indicator grid text when determining the relative importance of elements for any particular case.

4.4.1 Scientific or Engineering Excellence of the Researcher

This criterion comprises several elements that consider the researcher's contributions to the natural sciences and engineering (see Policy and Guidelines on the Assessment of Contributions to Research and Training). Reviewers consider contributions made over the past six years. For contributions made more than six years ago, where the impact is being felt now (e.g., exploitation of patent, inclusion in a code, etc.), applicants are provided the opportunity to highlight and discuss these in the Most Significant Contributions section. Ratings should always be reflective of the actual research experience of the applicant, taking into consideration any eligible delays. When assessing an applicant's previous work, members are asked to only consider the relevance of the NSE contributions. These contributions can have impacts to users from all sectors including academia, industry, government, policy makers, and the public.

The merit indicators for the *Scientific or Engineering Excellence of the Researcher* criterion are listed in Appendix 1. The following elements are considered in the evaluation of the Excellence of the Researcher:

- Knowledge, expertise, and experience of the researcher in the NSE. Possible evidence of stature in the field includes:
    - grants, awards, and/or prizes received;
    - invitations to give lectures, write review articles, and/or chair conference sessions;
    - membership on committees, editorial boards, and/or advisory boards not directly related to the applicant's research activities;
    - involvement in public outreach activities (e.g., organizing NSE promotional events, encouraging a diverse and representative pool of emerging scientists and

engineers, taking on leadership positions in NSE outreach, etc.); and/or
- other applicable recognition factors.

Current stature should be assessed based on recent accomplishments described in the application and should be judged in the context of the applicant's research community.

- Quality and impact of contributions to the proposed research and/or other areas of research in the NSE. Possible evidence of research accomplishments includes:
  - publications;
  - conference presentations and/or proceedings;
  - books or book chapters;
  - patents or technology transfer;
  - technical reports; and/or
  - other methods of dissemination as appropriate to the type of research.

  Assessment must be based on the quality and impact of all contributions, not only on the number of publications or conference presentations. Venues with the highest impact (as measured by readership or attendance) may not be the most appropriate for an applicant's research results and it is the responsibility of the applicant to explain the choice of venues for dissemination.

  The contributions submitted by the applicant are evidence of the quality of the applicant's work. Members' knowledge of a particular journal's review procedures may be helpful in assessing the quality of a publication. However, applicants should not be disadvantaged for publishing in journals that are not familiar to the members. It must be demonstrated that past contributions have achieved maximum impact and reached the appropriate target audiences. In this context, impact does not refer to quantitative indicators such as the impact factor of journals or h-index, but on the influence that results have had on other researchers, on the specific field, the discipline as a whole, or on other disciplines.

  Where publications are prepared in collaboration with students, postdoctoral fellows, or other researchers, the assessment must take into account the overall quality and impact of the work. In these instances, the applicant should have clearly described their role and intellectual contribution to collaborative work or joint publications.

  Impact can be seen as, but is not limited to, advancing knowledge, developing technology, addressing socio-economic or environmental needs, or contributing to increased diversity and gender equity in research. Members should be aware that the relevance of such considerations may differ depending on the discipline and the nature of the research being conducted.

- Importance of contributions to, and use by, other researchers and end-users. This can be measured by:
  - the extent to which the applicant's work has advanced the field (i.e., created significant changes in thought within the research area, impacted public policy, promoted the inclusion and advancement of women and

other under-represented groups in research, and/or influenced activities of users such as industry or the general public); and/or
- the extent of contributions to the development of standards or codes of practice.

EGs that only have a small proportion of applied science applications will often be more familiar with the track record indicators used for basic/fundamental science. Members must use caution and be conscious of placing too much emphasis on basic/fundamental science and engineering indicators of achievement and excellence, such as publications in refereed journals, and ignoring or de-emphasizing indicators of applied research achievements such as patents. See the Guidelines for the Preparation and Review of Applications in Engineering and the Applied Sciences for further details.

4.4.2 Merit of the Proposal

A program of research must be of high quality to warrant support. This criterion encompasses the assessment of the proposed program of research with long-term goals, rather than a single short-term project or collection of projects. The program must not be limited to the development of specific applications of existing knowledge; it must represent an original and innovative contribution.

The proposed program of research must be assessed based on its merit in the NSE and not human health or social sciences and humanities. To determine whether work is in the NSE or not, reviewers are asked to consider the Tri-Agency (CIHR, NSERC, and SSHRC) document Selecting the Appropriate Federal Granting Agency and the supporting Addendum to the Guidelines for the Eligibility of Applications Related to Human Health. Members must evaluate only the NSE content of the proposal. If the program is not in the NSE and/or if the projects are defined without being placed in the broader context of an NSE program, a rating of *Insufficient* for the MoP is warranted.

The merit indicators for the *Merit of the Proposal* (MoP) criterion are listed in Appendix 2. In assessing the MoP, the following elements should be considered:

- Originality and innovation:
  - the extent to which the proposal suggests and explores novel or potentially transformative concepts and lines of inquiry in the NSE; and
  - the extent to which the proposal will lead to advances in the NSE.

- Significance and expected contributions to NSE research; potential for policy- and/or technology-related impact:
  - the likely impact of the research, including the potential to advance knowledge in the field and influence the direction of thought and activity;
  - the potential for innovation in the discipline(s) or achievement of results with importance to a broad range of applications;
  - the suitability of results for dissemination and critical appraisal for use in the

research community and/or by stakeholders; and
- the significance of developed applications to general and/or limited end users (firms, institutions, etc.).

In any peer review system, there is a risk towards conservatism or excessive caution. Members should be open to new research problems and innovative approaches, and should focus their discussions on whether the problems addressed are challenging, interesting, could potentially have a transformative impact on the field, and whether the methodologies proposed could yield new and useful knowledge.

- Clarity and scope of objectives:
  - the articulation of long-term goals and short-term objectives and a clear description of their relationship;
  - specific, well-focused, and realistic statement(s) of objectives;
  - the articulation of goals with sufficient breadth and scope that reflects a high-quality research program; and
  - the demonstration of a cohesive research vision that is greater than simply plans and objectives.

- Clarity and appropriateness of methodology:
  - clear and detailed description of the proposed methodology; and
  - current, justified, and appropriate methodology that contributes to the stated research goals.

- Feasibility:
  - the complementarity of the applicant's expertise and the proposed methodology which would allow the objectives to be reached within the proposed timeframe;
  - accessibility to necessary equipment and resources;
  - the applicant's anticipation of potential problems and mitigating measures as it relates to stated objectives or potential access to funds; and
  - the applicant's capacity to undertake the planned program given their commitments to other research endeavours, as presented in the application.

- Extent to which the scope of the proposal addresses all relevant issues, including the need for varied expertise within or across disciplines:
  - summary of recent progress in research activities related to the proposal;
  - framing of the research with appropriate reference(s) to other relevant work in the field; and
  - consideration of relevant areas of knowledge and the applicant's proposed approach to addressing research questions.

Collaborative activities are encouraged through the Discovery Grants program and

reviewers should be particularly careful to give adequate credit to effective research interaction(s). Proposals that relate to interdisciplinary endeavours may appear somewhat unfocused when compared with other applications. The indicators of achievement and excellence in interdisciplinary research, or in emerging areas, are often not as evident as those for research in the mainstream of a given field. Therefore, members should recognize and appreciate the additional challenges inherent in interdisciplinary research. Members are also asked to keep an open mind to the practices and methodologies of disciplines other than their own.

For further information about the review of applications in interdisciplinary research, refer to the Guidelines for the Preparation and Review of Applications in Interdisciplinary Research.

- Appropriateness of, and justification for, the budget:
    - suitability of the budget in relation to the proposed methodology and expected results in terms of scale and feasibility of research plans (e.g., number of research personnel in relation to available equipment/resources, etc.); and
    - demonstration that funds requested in the current application are not for expenses supported or submitted for support through other sources.

  Discovery Grant applicants can receive research support from other sources for the same research ideas/objectives, as long as it is used to cover different expenses and that the funding sources are not CIHR or SSHRC. Other sources of research support include grants and contributions (held and applied for) from federal and provincial funding agencies, non-governmental organizations, the private sector, universities (e.g., institution start-up funds), the primary place of employment (for adjunct professors employed outside of academia), and/or others. The onus is on the applicant to demonstrate that the requested Discovery Grant funding will be for expenses that are distinct from those planned with support held. For funding applied for, applicants must demonstrate that there will be no duplication of funding for the same expense(s) by explaining how funds will be used if all applications are successful. Failure to meet these requirements warrants a rating of *Insufficient* for the Merit of the Proposal or the application may be rejected.

  Evaluation Group members must notify NSERC staff of any application requesting funds for expenses already funded or applied for through other sources.

- Demonstration that the Discovery Grant proposal is distinct conceptually from research support held or applied for through CIHR and/or SSHRC.

  The Discovery Grants Program supports research ideas/objectives that are entirely distinct from those supported or submitted for support through CIHR and/or SSHRC. Applicants must clearly explain:
    - how the proposed ideas, objectives and expenditures of the Discovery Grant application are entirely distinct from those supported or submitted for support through CIHR and/or SSHRC; and

- how the anticipated contributions to research resulting from the proposed Discovery Grant will be distinct from the ones resulting from CIHR and/or SSHRC support.

In addition to proposing research that is entirely distinct, applicants who hold or have applied for a CIHR Foundation Grant must clearly explain why the Discovery Grant funding is essential to carry out the research proposed in the DG application.

The onus is on the applicant to provide sufficient information for the Evaluation Group to determine whether the application meets these requirements. Failure to clearly demonstrate that the research proposed in the Discovery Grant application is entirely distinct from research support held or applied for through CIHR and/or SSHRC warrants a rating of *Insufficient* for the Merit of the Proposal criterion. For applicants who hold or have applied for a CIHR Foundation Grant, failure to provide convincing evidence that support from the Discovery Grants Program is essential to carry out the research proposed also warrants a rating of *Insufficient* for Merit of the Proposal criterion.

The evaluation of other sources of funds is limited to research support that will be, or may become, active within the funding period of the proposed Discovery Grant.

4.4.3 Contribution to the training of Highly Qualified Personnel

The training of Highly Qualified Personnel (HQP) is an essential criterion for the Discovery Grants program (see Policy and Guidelines on the Assessment of Contributions to Research and Training). Contributions to quality research training at all levels are valued, including undergraduate students involved in research and graduate students, postdoctoral fellows, technicians and research associates. HQP includes all research personnel involved in the applicant's research program, whether from academia, government, or industry.

The assessment of contributions to training of HQP is based on both the past training of HQP and the future plans for training. The merit indicators for the *Contributions to the training of Highly Qualified Personnel* criterion are listed in Appendix 3. The following elements should be considered in the evaluation of this criterion:

❖ **Past contributions to the training of HQP**

In assessing the training of HQP over the past six years, EG members must focus on the quality and impact of the research training. The level, content, and involvement of supervision or co-supervision in the training must be described. Where applicable, the applicant's role as co-supervisor must be clearly explained. Training must not be assessed solely in terms of the number and level of individuals supervised; it should be assessed by the quality and impact of training demonstrated through the following three components:

- Training environment. The research training and development opportunities provided for HQP can include:

- participation and involvement of HQP in science outreach activities, interdisciplinary research, collaborations, and/or interaction with the private and public sectors (e.g., industry, government agencies, etc.).

- HQP awards and research contributions. This can include:
  - HQP collaboration in the applicant's research contributions (usually as co-authors, depending on the discipline), which can include but is not limited to conferences, presentations, publications, patents, and/or technical reports; and/or
  - awards, scholarships and fellowships won by HQP.

- Outcomes and skills gained by HQP. This can include:
  - progression of HQP into further studies or careers that have impact, whether as professionals in the private, public sectors, and/or academia. Impact can be either in the NSE or not in the NSE, but it needs to be clear how the skills gained in the applicant's research training environment are being used by the HQP;
  - professional development skills and experiences gained; and/or
  - HQP completion of degree requirements within a reasonable amount of time.

Past HQP training can be in the NSE or non-NSE domains (e.g., health, social sciences), but must be in a research training environment that generates new knowledge or insights.

All applicants are evaluated using the same criteria. The only difference in the assessment of ECRs and ERs is the role of the training record in determining the final rating. ECRs should not be rated as *Insufficient* solely due to the lack of training record; the review should focus on the plan for future training. To compensate for the fact that ECRs have little to no training record and generally receive a lower HQP rating than most ERs, ECRs are usually funded to a lower quality threshold.

At the same time, it is usually unacceptable for an ER to have no training record, even if they were previously working in government, industry or the international community. For these applicants it is especially important to consider all types of research personnel, including interns, junior staff or visiting students who are directly under the applicant's supervision or co-supervision and involved in the applicant's research. The members should take into consideration the level of the applicant's involvement in these interactions. The applicant should clearly explain their role in the research training.

Considerations should be made in the case of delays that are beyond the control of the applicant. A pattern of prolonged periods of study or frequent student withdrawal from programs should be explained by the applicant. Members must consider acceptable delays that are beyond the control of the applicant (e.g., HQP parental leaves).

❖ **Training plan**

The HQP training plan must be in the NSE. A suitable training plan should provide details on the activities or projects in which HQP will be involved and how these relate to

achieving the objectives of the proposed research program. In assessing the quality, suitability and clarity of the plan for training, members should consider these two components:

- Training philosophy. The applicant's mentorship approach and enhancement of training environment can include:
  - how the applicant interacts with research personnel, the approach taken to train and impart knowledge to future scientists/engineers, the skillsets imparted to ensure HQP success;
  - intellectual involvement of HQP in the research program and its anticipated projects (i.e., the proposed research should leave room for growth and development and HQP should be more than simply extra hands for the researcher);
  - quality and extent of interactions with collaborators in academia, private and public sectors (e.g., industry, government agencies, etc.);
  - involvement in interdisciplinary research;
  - promotion of HQP participation in science outreach activities, professional development workshops, etc.; and/or
  - promoting the participation of a diverse group of HQP, taking into account equity in recruitment practices, mentorship and initiatives aimed at ensuring an inclusive research and work environment.

- HQP research training plan. This can include:
  - appropriateness of the level and mix of HQP for the proposed program and its anticipated projects (e.g., are the projects suitable for an undergraduate student, a master's student, PhD candidate, or postdoctoral fellow?);
  - description of anticipated outcomes in terms of future contribution to NSE knowledge and the training value of the proposed projects;
  - explanation of how the work will contribute to the development of new skills or knowledge; and/or
  - capacity of the researcher to supervise the proposed number and type of HQP.

ECRs and ERs with a meritorious research program but with no intent to train HQP (i.e. without an integrated HQP training plan), should receive a rating of *Insufficient* for this criterion. Applicants must provide justification if training of HQP will be limited with respect to the proposed research program. The justification should be taken into consideration by the EG when determining an appropriate rating for this criterion.

For further information for the assessment of contributions to the training of HQP, refer to the Frequently Asked Questions document.

4.4.3.1 Names of HQP in the CCV and application

In keeping with its obligation under the Privacy Act, NSERC requires applicants to

obtain consent before including the names of research personnel in the CCV and application. As this is not always feasible, applicants can provide information on research personnel without providing names. This information, though more generic, should be sufficient to enable the reviewers to consider the above-mentioned points.

4.4.4 Relative Cost of Research

Typically, Evaluation Groups do not use the Relative Cost of Research modifier. When used, members consider the cost of the proposed research relative to the normal costs in the discipline, in addition to the selection criteria above. This can include specific needs such as high user fees, logistics and travel in remote areas, laboratory consumables in limited supply, or expenses related to the nature of collaborative activities or infrastructure. The relative cost of research relates to individual circumstances, but in the context of an area of research. EGs will collectively determine the parameters for considering the cost of research. The relative cost of the proposed research program (high or normal) is compared to the norm for the research areas represented within the EGs.

It is expected that the majority of applications will be deemed to have normal costs of research. While some applicants might have higher costs of research in one budget category, these may be lower in another, leading to an overall assessment of a normal relative cost for the research program.

The appropriateness of, and justification for, the funding requested is considered within the MoP, not the Relative Cost of Research.

4.4.5 Additional considerations in the evaluation of applications

All applicants are evaluated against the same expectations in terms of the quality of the contributions that have been, or will be, produced. Some additional considerations which may influence the evaluation of any or all selection criteria are detailed below.

4.4.5.1 External reviewer reports

External reviewers help provide a deeper overall assessment of an application. External reviewers may be familiar with a particular research area or technique and may be able to comment on an applicant's contributions to the field. EGs should focus on the content and credibility of external reviewer reports as inputs into the evaluation process, but must ultimately base their recommendations on their own relative assessments.

External reviewer reports contribute to these assessments, but must not be used on their own to either accept or reject a proposal. EGs should be sensitive to any real or perceived conflict of interest or relationship between the external reviewer and the applicant that might influence the review (e.g., professional interactions, potential competition). These must be brought to the attention of NSERC staff and, if needed, addressed in the Message to Applicant. EGs should also recognize that the background of an external reviewer might influence the review (e.g., school of thought bias, lack of familiarity with the Canadian research funding environment, etc.)

4.4.5.2 Implicit or unconscious biases

NSERC asks EG members to consistently guard against the possibility of unconscious bias influencing the decision-making process, whether this bias is based on a school of thought, fundamental versus applied research, certain sub-disciplines, areas of research or approaches (including emerging ones), size or reputation of an institution, age, personal factors, sex or gender of the applicant. NSERC cautions members against any judgment of an application based on such factors.

NSERC is actively engaged in increasing diversity and gender equity in its peer review process to increase the inclusion of women and other under-represented groups in the NSE. For reference, see NSERC's Policy Statement on Gender Equality in Science and Engineering and available resources such as Strengthening Canada's Research Capacity: The Gender Dimension and NSERC 2020: A Strategic Plan.

4.4.5.3 Early career researchers

NSERC is committed to supporting early career researchers (ECRs) who have the training and expertise to make valuable research contributions in the NSE. Following the evaluation of all applications, the aim is to support at least 50 percent of early career applicants, subject to the assurance of high quality. A lower-rated cutoff may be established for this group. NSERC considers it important to allow early career researchers to demonstrate their potential for quality contributions to research and training. Funding levels for like-rated early career or established researchers are expected to be similar. The duration of funding would usually be for five years, to allow sufficient time for the applicant to demonstrate research excellence.

All applicants are evaluated using the same criteria. The only difference in the assessment of ECRs and ERs is the role of the training record in determining the final rating. ECRs should not be rated as *Insufficient* merely for having no training record; the plan for future training should be taken into consideration. It is possible for an ECR to be rated *Insufficient* if the plans for research personnel are not appropriate or are not described with enough information to predict likelihood of HQP success. However, it is unacceptable for an established researcher to have no training record.

ECRs who continue to collaborate with previous supervisors, or who carry out research as part of a group, should clearly define their contributions to the collaborative work.

4.4.5.4 Delays in research and dissemination of research results

Applicants are asked to explain and give start and end dates for any significant delays in the research activity or in the dissemination of research results within the last six years (e.g., parental leave, bereavement, illness, extraordinary administrative duties).

NSERC recognizes that research productivity and contributions to the training of HQP may also be disrupted due to delays incurred either by the applicant or by HQP.

In these cases the applicant's productivity would be assessed over the active period (i.e., excluding the defined period of delay). Members are to recognize delays and assess the quality of research activity during the researcher's active period.

4.4.5.5 Adjunct and emeritus professors

It is NSERC's policy to recognize and support the important role played by adjunct and emeritus professors in university-based research and research training at Canadian universities.

Applications from adjunct and emeritus professors are evaluated using the same selection criteria, scale, indicators, and time frame (past six years) as all other applications. Where the terms of an individual's appointment do not permit sole supervision of HQP, it is expected that a satisfactory plan for co-supervision will be presented and clearly described in the application.

The onus is on the applicant to provide sufficient information to enable members to assess this appropriately. This could include information on the university's policy with respect to co-supervision of HQP and information on the type/level of possible interactions with HQP.

Specifically in the case of adjunct professors whose primary position is in industry or government, NSERC will award funds only for the direct support of students (salaries or stipends and student travel costs). All other costs must be covered through other sources of funding. Members should notify NSERC staff of any application where ineligible expenses are being proposed.

4.4.5.6 Duration of grants

The duration of a Discovery Grant for all applicants is five years. NSERC may grant a one-year award based on principles within the framework of funding recommendations. Members should note that when a one-year award is recommended, the applicant will have about six months to address any problems noted by the EG before submitting a new application.

4.5 Discovery Accelerator Supplements

The Discovery Accelerator Supplements Program (DAS) provides substantial and timely additional resources to accelerate progress and maximize the impact of superior research programs.

Awards are determined by EGs in a two-step selection process. First, while reviewing Discovery Grant applications, members nominate applicants who could meet the objectives of accelerating progress and maximizing impact. Nominees should have a superior research program that is highly rated in terms of originality and innovation, and should show strong potential to become international leaders within their field.

Members should be aware that this award is not meant for researchers who have already reached an international stature. However, if such an applicant is proposing research that

consists of a new direction in which they may become an international leader, the researcher may be an eligible candidate for a DAS. These additional resources should enable an applicant with an established, superior research program to capitalize on an opportunity or a bold idea (e.g., a recent research breakthrough, paradigm shift, new strategy to tackle a scientific problem or research question, etc.).

In the second step, after the evaluation of Discovery Grant applications is concluded, the executive committee for each EG conducts a final analysis of the DAS nominees to select those who best meet the objectives of the program, within the quota of DAS awards allocated to the EG.

4.5.1 Nominations

While reviewing Discovery Grant applications prior to the peer review meetings, all EG members are requested to identify, from their list of assignments, those that are meritorious and appropriate to receive a DAS. Members are encouraged to be judicious in their choices for nominations, using the DAS description. Members will put forward their DAS nominations during the discussion and review of the Discovery Grant application during the peer review meetings. DAS nominees will be briefly discussed and voted on during the review of their Discovery Grant application during the peer review meetings.

4.5.2 Voting

Members will be asked to indicate their level of support for applications nominated for a DAS by voting electronically using a rating scale from 1 (maximum support) to 4 (no support). The meaning of each level of support is defined in the DAS grid.

4.5.3 Rationales

EGs are required to provide a written rationale for each DAS nomination addressing the key components of the DAS program using the DAS rationale form. Since the time available to prepare the rationales during the peer review meetings is limited, members are encouraged to prepare a draft rationale in advance. The nominator will be asked to edit the draft based on discussion and submit the final rationale to NSERC staff prior to the executive committee meeting.

4.5.4 Executive committee analysis

The executive committee reviews the DAS nominations and rationales, and establishes a final ranked list for recommendation to NSERC. Executive committee members should rely on the recommendations, expertise, and standardized scoring provided by the reviewing members at the EG level.

5. Framework for Funding Recommendations

The review of applications and the recommendation of grant amounts occur in two separate steps. In the first, the EG performs a merit assessment of each application on the basis of the selection criteria and the Discovery Grants Merit Indicators. In addition, the EG may vote on whether the proposal has normal or higher than normal associated costs of research relative to others in the field. In the second step, once all applications have been evaluated and their ratings established, applications that have the same overall rating are grouped in a funding bin. The combination of an applicant's ratings for the three selection criteria determines the overall rating and the funding bin. Final recommendations for budget distribution within an EG are made by the Executive Committee in consultation with NSERC staff.

The following guiding principles apply when determining funding recommendations:

- To be successful, applications have to meet a minimum quality threshold;
- A rating of at least *Strong* is required under the Excellence of the Researcher criterion for an award to be made to an established researcher;
- Ratings of *Insufficient* under any of the three selection criteria for both early career and established researchers will result in no funding;
- Applicants will never be awarded more than the requested amount regardless of the funding level assigned to each bin.

The executive committee will be asked for input with respect to recommending funding within the budget of the EG (e.g., on minimum grant amount recommendation for the disciplines, preferable success rates to maintain, or consistency in bin values across competition years). They may consult the EG or part of the community on the strategy that would guide such choices. This consultation should take place prior to the executive committee meeting, and in advance of the peer review meetings.

With each competition, bin recommendations and values can change based on the final bin distribution of applicants and the available budget. However to ensure consistency among cohorts, the starting bin values at the beginning of the competition are reset back to the pre-established reference values for the EG.

In situations involving a violation of policy or guidelines, NSERC is able to overturn a funding recommendation. Final decisions on funding recommendations are the responsibility of NSERC.

6. Confidentiality

Details of the EG discussion and recommendation on a specific application are confidential and must never be divulged. Release of information must be done by NSERC. Under no circumstances should members divulge to anyone the recommendations emanating from the peer review meetings or subsequent to the competition.

EG funding recommendations are made by the executive committee and are subject to approval by NSERC and may be changed for reasons of budget, administrative error, or lack

of full adherence to NSERC policies.

In accordance with the Conflict of Interest and Confidentiality Agreement for Review Committee Members, External Reviewers, and Observers (Federal Research Funding Organizations) and the Conflict of Interest and Confidentiality for Review Committee Members, External Reviewers, and Observers (NSERC), members are not permitted to discuss specific results or the deliberations. Requests from applicants or enquiries on competition results, individual cases, or EG discussions must be redirected to NSERC staff. If approached, members may wish to point out that they are required to leave the room during the discussion of an application where they are in conflict of interest.

7. Communication of Results

NSERC communicates the funding results to applicants in early April following final approval. The results lists are released to each university shortly before, or concurrent with individual notifications. Funding decisions and related statistics are also posted on the NSERC website at a later date.

7.1 Message to applicant

Following the review of an application, EGs can provide written comments to the applicant as they see fit. These written comments are conveyed as a Message to Applicant (MTA) and are provided to the applicant by NSERC at the time of notification of decision.

Constructive comments within the MTA are of vital importance to enable researchers to improve future applications and/or research programs. MTAs should comment primarily on aspects of the application that were important in arriving at the EG's recommendation. Both strengths and weaknesses are appropriate for inclusion. MTAs can also provide information on the external reviewer reports received. Members should be aware that all applicants, including those who do not receive comments within their MTA, will automatically be sent any external reviewer reports received. If comments within the external reviewer report were a factor in arriving at the final recommendation, the MTA should state the specific points of agreement or disagreement.

While an MTA can be prepared for any application, NSERC requires that one be provided when there is a rating of *Moderate* or *Insufficient* on any selection criteria.

NSERC recommends that comments also be provided in the following cases:

- An external reviewer report is perceived to be particularly biased and the members wish to reassure the applicant that it did not influence the evaluation; and/or
- NSERC instructions or presentation guidelines have not been followed.

7.1.1 Preparation of Messages to Applicants

Following the discussion of each application, NSERC staff will indicate if an MTA is needed and will designate a member to prepare it. When preparing comments, the designated member

should consult with the other internal reviewers to ensure that comments accurately reflect the EG's recommendation. Consulting with the other internal reviewers also helps to ensure accuracy and completeness before submitting the MTA to NSERC. Members preparing comments should ensure that they are drafted before the end of each day.

In cases of returning applicants who were unsuccessful in the past, received an award of shorter duration, or where ratings of *Moderate* or *Insufficient* were awarded in previous competitions, the previous MTA may be shared with the members after the vote. When this is done, it is to ensure that the current EG is not sending confusing or contradictory messages to the applicant. The EG may comment on issues raised previously that have or have not been addressed adequately in the current application.

The time available to prepare the MTAs during the peer review meetings is limited. For this reason, internal reviewers should prepare notes which highlight the strengths and weaknesses of applications in advance.

While reviewers may have drafted comments prior to the peer review meetings, the final version of the MTA provided to NSERC must reflect the EG's assessment and recommendation.

7.1.2 Approval of final Messages to Applicants

The section chair reviews and approves all MTAs before they are sent to applicants to ensure that each reflects the EG's recommendations. NSERC staff also reviews all MTAs to ensure that feedback to applicants is consistent with NSERC policies and guidelines, is appropriate for transmission to the applicant, and is clear and detailed enough to be useful in the preparation of future submissions.

Occasionally, NSERC staff may identify issues or inconsistencies within the MTA. These issues may be resolved by clarifying with the author or by discussing the case with the section chair.

7.2 Annual report

The EG annual report represents the formal record of the executive committee's feedback on the peer review meetings and is distributed to NSERC staff and members of CDR for information and follow-up. This document is a key source for policy discussions that take place at CDR meetings. Occasionally, the EG annual report is distributed publicly to groups such as department chairs in a given discipline or professional associations.

The EG annual report is prepared by the executive committee members with assistance from NSERC staff. This report should highlight:

- competition outcomes and the EG's general impression of selection criteria, pressures on the budget, issues of concerns and new areas of research;
- comments and recommendations on policies and procedures. These could include, but are not

limited to, feedback on program philosophy and objectives and their link to the optimal use of resources for the support of sciences and engineering;
- trends and issues within the discipline, comments on program delivery mechanisms, program literature and forms, and identification of research suitable for public relations efforts; and
- competition statistics.

8. Legal and Ethical Information

8.1 Responsible Conduct of Research

Canada's federal granting agencies—Canadian Institutes of Health Research (CIHR), Natural Sciences and Engineering Research Council of Canada (NSERC), and Social Sciences and Humanities Research Council of Canada (SSHRC)—are committed to fostering and maintaining an environment that supports and promotes the responsible conduct of research. The new Tri-Agency Framework: Responsible Conduct of Research sets out the responsibilities and corresponding policies for researchers, institutions, and the agencies that together help support and promote a positive research environment.

Committee Member's Role

The agencies expect the highest standards of integrity in the research that they fund and in the review process they manage. The electronic submission of an application to the agencies commits the applicant(s) to a number of principles, including compliance with the *Tri-Agency Framework: Responsible Conduct of Research*. **Should members identify, during the evaluation process, what appears to be a lack of integrity** (e.g., a misrepresentation in an agency application or related document—such as providing incomplete, inaccurate or false information)**, they should bring their concerns to the attention of agency staff at the earliest opportunity**. The agency will then refer any allegations to the Secretariat on Responsible Conduct of Research for follow-up. Such allegations should not be a consideration during the review process, nor should they be part of the committee's evaluation discussions.

Committee members who raise concerns should rest assured that the matter will be addressed by the Secretariat in accordance with the Tri-Agency Framework: Responsible Conduct of Research; however, members will not be privy to the outcome of the matter, as the findings are confidential and no personal information is shared.

In addition, committee members should notify the agencies of any conflict of interest - financial or otherwise - that might influence the agencies' decision on what applications the members can review. Committee members and external reviewers are responsible for respecting the confidentiality of application material and for declaring conflicts of interest. Should committee members become aware of a situation that violates the integrity of the review process, they should discuss this immediately with agency staff.

8.2 Ethical and Other Considerations

NSERC requires that researchers adhere to a number of policies and guidelines governing research in particular areas, as described in Section 2.4 of the Tri-Agency Framework: Responsible Conduct of Research:

- Research requiring the use of animals
- Research involving human subjects
- Research involving human pluripotent stem cells
- Research involving controlled information
- Research involving biohazards
- Research involving radioactive materials
- Research that potentially has an effect on the environment

These are described in the section "Requirements for Certain Types of Research" in the NSERC Program Guide for Professors.

It is the responsibility of NSERC staff, with the support of administrators from research institutions, to ensure that the researchers adhere to these guidelines. However, reviewers must alert NSERC to any potential ethical concerns or problems that are observed in information sessions or during the evaluation process. Here are some examples:

- Inadequate sensitivity to the potential concerns of human subjects and/or inadequate provisions for the participation of human subjects in experiments, as required by the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans
- Use of animals in experiments where the significance of the proposed research does not appear to justify either the use of animal subjects or the proposed experimental protocol
- Inclusion of controlled information in an application
- Inadequate training of graduate students in the handling of hazardous chemicals or biological substances
- Potentially harmful effects on the environment, or an inaccurate or incomplete assessment of these effects.
- Research that involves the use of human pluripotent stem cells where the applicant has checked the "yes" on their application.

If an EG or panel raises serious ethical concerns, these concerns should be discussed immediately with NSERC staff to determine if there is a means of resolving any apparent problems quickly, or if the release of any grant funds should be delayed pending resolution of the problem.

8.3 Confidentiality

Members appointed to the EG must read and sign the Conflict of Interest and Confidentiality Agreement for Review Committee Members, External Reviewers, and Observers describing NSERC's expectations and requirements.

All application material is provided to members in strict confidence and must be used for review purposes only. Such material should be kept in a secure place that is not accessible to colleagues or students.

Members must leave their application material/USB key (except their personal notes) at the peer review meetings for disposal by NSERC. If NSERC requires assistance to provide additional information for particular cases after the peer review meetings (e.g., for an appeal case), the relevant information will be provided to the members. The material members still possess after the end of their term on an EG (e.g., their personal notes on applications reviewed) must be destroyed by a secure process, e.g., by deleting electronic data files, shredding or burning paper, or arranging their return to NSERC.

8.4 Communication with applicants

NSERC staff act as liaison between the EG and the applicants. Members **must not** enter into direct communication with applicants to obtain additional information on their proposals or for any other purpose related to the application, and must refer all enquiries from applicants to NSERC. Members should contact the program officer if they require further information.

8.5 EG/Panel Members under Investigation

As required by 6.3.2.i of the Conflict of Interest and Confidentiality Policy of the Federal Research Funding Organizations, members of an NSERC EG or panel who find themselves in the position of having to respond to formal allegations of financial or professional impropriety **cannot** participate in the work of the EG or panel while an investigation is under way.

8.6 Privacy Act

Personal information means any information about an identifiable individual. Based on the *Privacy Act*, personal information provided to NSERC by applicants must be used only for the purpose of assessing NSERC applications, making funding decisions and for certain related uses described to applicants by NSERC at the time that their personal information is collected. Members are reminded that the use or disclosure of this information for any other purpose is illegal.

In most cases, NSERC collects personal information directly from the individual to whom it relates. NSERC may also collect it from other sources, such as external reviewers, as part of the formal peer review process. For this reason, EGs must not use or consider information about an applicant that has been obtained in any other way, for example, by an EG member by virtue of his/her involvement in non-NSERC activities.

An applicant has the legal right to access personal information in NSERC files, including, for example, the full texts of external reviewer reports or EG feedback. The *Privacy Act* allows NSERC to edit a peer reviewer's name from a review before disclosing it to the applicant; however, lists of EG members are published regularly by NSERC, so

applicants know who the EG members are.

It is important for EG members to adhere strictly to the guidelines set out in the Conflict of Interest and Confidentiality Agreement for Review Committee Members, External Reviewers, and Observers.

8.7 Canadian Human Rights Act

The activities of NSERC are subject to the *Canadian Human Rights Act*. The purpose of the *Act* is to give effect to the principle that every individual should have equal opportunity with other individuals to make the life that he or she is able and wishes to have, consistent with the duties and obligations as a member of society, without being hindered or prevented from doing so by discriminatory practices.

For all purposes of the *Act*, race, national or ethnic origin, colour, religion, age, sex, marital status, family status, disability and conviction for an offence for which a pardon has been granted are prohibited grounds for discrimination. Where the grounds for discrimination are pregnancy or childbirth, the discrimination is deemed to be on the grounds of sex.

It is a discriminatory practice to deny a service to an individual, or to differentiate adversely in relation to any individual in the provision of that service.

8.8 Official Languages Act

NSERC ensures that its EGs or panels and staff are fully aware of their obligations and rights regarding official languages as legislated in the *Official Languages Act*.

In accordance with its active offer of bilingual service to the public, NSERC strives to appoint an appropriate number of experts with the appropriate language capabilities to serve on EGs and panels. EGs and panels visiting francophone researchers must ensure that meetings can be conducted in French. If required, an NSERC staff member will accompany those visiting teams that foresee difficulties in this regard. EGs must ensure that all applications receive a full and detailed evaluation, regardless of the official language of presentation. On occasion, this may entail consultation with NSERC staff to identify EG members or external reviewers with adequate linguistic capability.

In accordance with its active offer of bilingual service to the public, upon request, NSERC will provide the service of simultaneous translation for the EGs during the peer review meetings. EG members who wish to make use of this service should advise NSERC well in advance of the meeting to allow for the preparations.

Important Links

1. Discovery Grants Merit Indicators
2. Guidelines Governing Membership of Selection Committees and Panels
3. Conflict of Interest and Confidentiality Agreement for Review Committee Members, External Reviewers, and Observers
4. Conflict of Interest and Confidentiality for Review Committee Members, External Reviewers, and Observers
5. Policy and Guidelines on the Assessment of Contributions to Research and Training
6. Guidelines for the Preparation and Review of Applications in Engineering and the Applied Sciences
7. Guidelines for the Preparation and Review of Applications in Interdisciplinary Research

Acronyms and Abbreviations

Acronym	Definition
CCV	Canadian Common CV
CDR	Committee on Discovery Research
CIHR	Canadian Institutes of Health Research
DAS	Discovery Accelerator Supplement
EA	Environmental Assessment
ECR	Early Career Researcher
EG	Evaluation Group
EoR	Excellence of the Researcher
ER	Established Researcher
HQP	Highly Qualified Personnel
MoP	Merit of the Proposal
MTA	Message to Applicant
NOI	Notification of Intent to Apply
NSE	Natural Sciences and Engineering
NSERC	Natural Sciences and Engineering Research Council of Canada
SME	Subject Matter Eligibility
SSHRC	Social Sciences and Humanities Research Council of Canada

Appendix 1 – Excellence of the Researcher merit indicators

Exceptional	Acknowledged as a **leader** who has continued to make, over the last six years, **influential accomplishments at** the highest level of quality, impact and/or importance to a **broad community**.
Outstanding	The accomplishments presented in the application were deemed to be **far superior** in quality, impact and/or importance to a **broad community**.
Very Strong	The accomplishments presented in the application were deemed to be of **superior** quality, impact and/or importance.
Strong	The accomplishments presented in the application were deemed to be **solid** in their quality, impact and/or importance.
Moderate	The accomplishments presented in the application were deemed to be of **reasonable** quality, impact and/or importance.
Insufficient	The accomplishments presented in the application were deemed to be **below an acceptable level** of quality, impact and/or importance.

Appendix 2 – Merit of the Proposal merit indicators

Exceptional	Proposed research program is clearly presented, is **extremely original and innovative** and is **likely to have impact by leading to groundbreaking advances** in the area and/or **leading to a technology or policy** that addresses socio-economic or environmental needs. **Long-term vision** and **short-term objectives** are **clearly defined**. The methodology is **clearly defined and appropriate**. The application **clearly demonstrates** how the research activities to be supported are distinct from those funded (or applied for) by other sources.
Outstanding	Proposed research program is clearly presented, is **highly original and innovative** and is **likely to have impact by contributing to groundbreaking advances** in the area, and/or **leading to a technology or policy** that addresses socio-economic or environmental needs. **Long-term goals are clearly defined and short-term objectives are well planned**. The methodology is **clearly described and appropriate**. The application **clearly demonstrates** how the research activities to be supported are distinct from those funded (or applied for) by other sources.
Very Strong	Proposed research program is clearly presented, is **original and innovative** and **is likely to have impact by leading to advancements** and/or addressing socio-economic or environmental needs. **Long- term goals are defined and short-term objectives are planned**. The methodology is **clearly described and appropriate**. The application **clearly demonstrates** how the research activities to be supported are distinct from those funded (or applied for) by other sources.
Strong	Proposed research program is clearly presented, is **original and innovative** and is **likely to have impact** and/or address socio-economic or environmental needs. **Long-term goals and short-term objectives are clearly described**. The methodology is **described and appropriate**. The application **clearly demonstrates** how the research activities to be supported are distinct from those funded (or applied for) by other sources.
Moderate	Proposed research program is clearly presented, has **original and innovative aspects** and **may have impact** and/or address socio-economic or environmental needs. **Long-term and short-term objectives are described**. The methodology is **partially described and/or appropriate**. The application **clearly demonstrates** how the research activities to be supported are distinct from those funded (or applied for) by other sources.
Insufficient	Proposed research program, as presented **lacks clarity**, and/or is of **limited originality and innovation**. **Objectives are not clearly described** and/or likely not attainable. Methodology is **not clearly described and/or appropriate**. The application **does not clearly demonstrate** how the research activities to be supported are distinct from those funded (or applied for) by other sources.

Appendix 3 – Contributions to the training of HQP merit indicators

Exceptional	Past training is **at the highest level** in terms of the research training environment provided and HQP contributions to research. **Most** HQP move on to **highly impactful** positions that require skills gained through the training received. Training philosophy and research training plans are **of the highest quality**: **highly appropriate, clearly defined** and expected to produce **top quality** results in terms of the overall approach and specific projects for HQP.
Outstanding	Past training is **far superior** to other applicants in terms of research training environment provided and HQP contributions to research. **Most** HQP move on to **impactful** positions that require skills gained through the training received. Training philosophy and research training plans are **far superior**: **highly appropriate, clearly defined** and expected to produce **high quality** results in terms of the overall approach and specific projects for HQP.
Very Strong	Past training is **superior** to other applicants in terms of the research training environment provided and HQP contributions to research. HQP **generally** move on to **impactful** positions that require skills gained through the training received. Training philosophy and research training plans are **superior**: **highly appropriate**, **clearly defined** and expected to produce **quality** results in terms of the overall approach and specific projects for HQP.
Strong	Past training compares **favourably** with other applicants in terms of the research training environment provided and HQP contributions to research. HQP **generally** move on to positions that require skills gained through the training received. Training philosophy and research training plans are **appropriate** and **clearly defined** in terms of the overall approach and specific projects for HQP.
Moderate	Past training is **modest** relative to other applicants in terms of the research training environment provided and HQP contributions to research. **Some** HQP move on to positions that require skills gained through the training received. Training philosophy and research training plans are **partially appropriate** and **partially defined** in terms of the overall approach and specific projects for HQP.
Insufficient	Past training is **below an acceptable level** in terms of the research training environment provided and HQP contributions to research. HQP **rarely** move on to positions that require skills gained through the training received. Training philosophy and research training plans are **not appropriate** and **not clearly defined** in terms of the overall approach and specific projects for HQP.

Appendix 4 – Discovery Grants Rating Form

Applicant:	**Department/University:**
Applicant status:	
Title of proposal:	
Selection criteria (See Instructions for complete details)	

Excellence of the researcher	☐ **Exceptional**	☐ **Outstanding**	☐ **Very Strong**
	☐ **Strong**	☐ **Moderate**	☐ **Insufficient**
• Knowledge, expertise, and experience of the researcher in the NSE • Quality and impact of contributions to the proposed research and/or other areas of research in the NSE • Importance of contributions to, and use by, other research and end-users	**Rationale for rating:**		
Merit of the proposal	☐ **Exceptional**	☐ **Outstanding**	☐ **Very Strong**
	☐ **Strong**	☐ **Moderate**	☐ **Insufficient**
• Originality and innovation • Significance and expected contributions to NSE research; potential for policy- and/or technology-related impact • Clarity and scope of objectives • Clarity and appropriateness of methodology • Feasibility • Extent to which the scope of the proposal addresses all relevant issues • Appropriateness of, and justification for, the budget • Demonstration that the Discovery Grant proposal is distinct conceptually from research supported (or submitted for support) through CIHR and/or SSHRC • Clear explanation why Discovery Grant funding is essential to carry out the research proposed in the DG application (for applicants who hold or have applied for a CIHR Foundation Grant)	**Rationale for rating:**		
Contributions to the training of highly qualified personnel	☐ **Exceptional**	☐ **Outstanding**	☐ **Very Strong**
	☐ **Strong**	☐ **Moderate**	☐ **Insufficient**

• Past contributions to the training of HQP
  • Training environment
  • HQP awards and research contributions
  • Outcomes and skills gained by HQP
• Training plan
  • Training philosophy
  • HQP research training plan
	Rationale for rating:		

Relative cost of research (cost of the proposed research program relative to the normal costs in the discipline)	☐ **Normal**	☐ **High**
Rationale for Cost of Research:		
Other comments (e.g., duration should be less than norm, special circumstances, quality of samples of contributions provided, environmental impact, ethical concerns):		
Comments from external referees (please also highlight any comments that would be deemed inappropriate for the members to have considered in their discussions):		
Message to the applicant:		
Discovery Accelerator Supplement (DAS) ☐ **Yes** ☐ **No**		
Rationale for DAS recommendation:		

This form is provided by NSERC as an aid to members for reviewing applications. Once completed, the form contains personal information, and like all other review material, must be stored in a secure manner to prevent unauthorized access (refer to Conflict of Interest and Confidentiality Agreement for Review Committee Members, External Reviewers, and Observers).

The rating sheet focuses on the evaluation criteria and integrates, where appropriate, external reviewer comments and any other relevant information, e.g., delays in research. Using the rating sheet will help to ensure that you take all selection criteria into account when formulating your recommendation (refer to the Peer Review Manual for details). Note that NSERC does not collect these forms, and they should be destroyed in a secure manner after the peer review meetings.

(2017 version)

Appendix 5 – DAS Nomination Rationale Form

Discovery Accelerator Supplement (DAS)
DAS Nomination Rationale – 2018 Competition EG XXXX

Applicant name and institution:

DAS Program Definition:

The DAS program provides substantial and timely additional resources to researchers who have a superior research program that is highly rated in terms of originality and innovation, and who show strong potential to become international leaders within their field. These additional resources should enable a researcher with an established, superior research program to capitalize on an opportunity or a bold idea (for example: a recent research breakthrough, a paradigm shift or a new strategy to tackle a scientific problem or research question, etc.).

Please provide a rationale for your DAS nomination by addressing the following:

- Explain how the research program is original and innovative, and describe the opportunity or bold idea to be capitalized on. Explain how a DAS could accelerate progress and maximize impact for this nominee.

- Illustrate how the nominee shows strong potential to become a leader internationally within their field. If the nominee is already an international leader, explain how they are transitioning to a new area where they are not yet an international leader.

- If the nominee is an Early Career Researcher, provide supporting evidence that demonstrates that they have an established, superior research program.

Appendix 6 – DAS Evaluation Grid

The Discovery Accelerator Supplements Program (DAS) provides substantial and timely additional resources to **accelerate progress** and **maximize the impact** of superior research programs.

Does the Discovery Grant application satisfy the DAS program description and objective? What level of support do you assign to this DAS nomination?

<table>
<tr><th>1-Maximum Support</th><th>2-Solid Support</th><th>3-Minimal Support</th><th>4- No Support</th></tr>
<tr><td>• superior research program that is highly rated in terms of originality and innovation; and
• shows strong potential to become an international leader within their field.</td><td>• superior research program that is highly rated in terms of originality and innovation; and
• shows potential to become an international leader within their field.

OR

• superior research program that is original and innovative; and
• shows strong potential to become an international leader within their field.</td><td>• superior research program that is original and innovative; and
• shows potential to become an international leader within their field.</td><td>• does not satisfy the criteria of the DAS program description; or
• does not meet the objective.</td></tr>
<tr><td colspan="3">AND has an established, superior research program;

AND can capitalize on an opportunity or a bold idea.</td><td>Unclear whether research program is established, superior.

Unclear whether there is an opportunity or bold idea to be capitalized on.</td></tr>
</table>

EGs are required to provide a written rationale for each DAS nomination addressing the key components of the DAS program using the DAS Rationale template.