# PANELIST GUIDE
## IN THE REVIEW AND RATING OF THE
## NATIONAL SCIENCE FOUNDATION
## GRADUATE RESEARCH FELLOWSHIP APPLICATIONS
### *Program Year 2018*

## INTRODUCTION

The NSF Graduate Research Fellowship Program (GRFP) ensures the vitality and diversity of the scientific and engineering workforce of the United States by supporting outstanding graduate students who are pursuing research-based master's and doctoral degrees in science, technology, engineering, and mathematics (STEM) or in STEM education. GRFP provides three years of support for individuals who have demonstrated potential for significant research achievements in STEM or STEM education. NSF especially encourages women, underrepresented minorities (URM), persons with disabilities, and veterans.

Please review the **2018 GRFP Solicitation (NSF 16-588)** at https://www.nsf.gov/pubs/2016/nsf16588/nsf16588.htm. The solicitation is the official document to which applicants have responded and provides background critical to evaluate GRFP applications.

## OVERVIEW OF PANEL RESPONSIBILITIES

The responsibility of each panel is to evaluate the merit of eligible GRFP applicants by applying the National Science Board (NSB)-approved merit review criteria of *Intellectual Merit* and *Broader Impacts*, and to recommend individuals for NSF Graduate Research Fellowships. Applications are reviewed in disciplinary and interdisciplinary panels based on the applicant's selected field of study, where they are rated and ranked by scientists, engineers, and experts in graduate education.

**GRFP supports individuals who demonstrate the potential for significant achievements in science and engineering. Panelists are asked to evaluate each applicant holistically, taking into account individual interests, skills, and competencies, based on all of the materials in the application.**

## CONFLICTS OF INTEREST AND STANDARDS OF ETHICAL CONDUCT

Panelists are considered "special government employees" for the purposes of complying with NSF Manual 15, Conflicts of Interest and Standards of Ethical Conduct, Sections 20-21. Each reviewer must complete, read, and submit electronic certification NSF Form 1230P (05/2015), Conflict-of-Interests and Confidentiality Statement for NSF Panelists certifying compliance with these policies before reading any applications.

Confidentiality of Applications, Reviews, Deliberations, and Panelists

Applications and identity of reviewers are confidential. Panelists must not copy, quote, or otherwise use material from any applications, reviews, or deliberations.

Please note the following:
- All deliberations, application materials, ranking and discrepancy reports, outcomes, and content of the Panelist Orientation materials and Panelist Guide, are confidential and must not be shared outside the panel, or with the public.
- Any hard copy of notes and/or panel reviews and reports must be destroyed when panel activities are finished.

- Panelists must not distribute, or quote from application materials or reports at any time during the review period or after panel activities have concluded.
- All GRFP application-related materials stored digitally must be deleted.
- The identity of all panelists is confidential. Individuals serving as GRFP panelists must not be identified as such.
- Recording of the virtual panel meeting is prohibited. No information about the deliberations of the panel may be tweeted, posted, or communicated on social media.
- Virtual panel participants must take care that others do not overhear panel discussions (i.e., close your door and do not let others into the room).

Panelists must not participate in the evaluation of applications that pose a potential conflict of interest (COI) or the perception thereof. For those applicants with whom a panelist has a potential COI, the panelist must report the COI to an NSF Program Officer by clicking *Contact Program Staff* and then *COI* on the home screen of the GRFP Review Site. Panelists may not serve on a panel that is evaluating an applicant for whom they have submitted a letter of recommendation. For other applicants with whom a panelist has a COI, the panelist must not review or engage in any discussion of that applicant during panel deliberations.

If, during the virtual panel review, panelists discover an actual or perceived COI, they must excuse themselves from the discussion of that application.

In addition to the examples of possible conflicts listed on NSF Form 1230P, panelists must avoid reviewing applications where any of the following conditions apply:

- The applicant is:
  - a person for whom a panelist has written a letter of reference for GRFP (in this case, the panelist should not serve on the same panel that evaluates that applicant)
  - a current advisee or thesis student (in this case, the panelist should not serve on the same panel that evaluates that applicant)
  - a past advisee or thesis student
  - a family member
  - a student attending the panelist's institution
  - proposing to attend or work at the panelist's home institution
  - proposing to work (or has worked) with a collaborator of the panelist
  - a business or professional partner
  - a collaborator within the past 48 months
  - a co-editor within the past 24 months

- The application involves:
  - the employer/school of spouse or child
  - an employer who is considering you for a job
  - a person living in your household or employed by you
  - your parent's employer (except solely receipt of honoraria)

NSF highly values the service panelists provide and recognizes the need to capture these

efforts in faculty/staff reporting of service activities. To ensure the confidentiality of the review process, cite panel service on a CV only as follows:

*National Science Foundation, panelist (2018).*

## MERIT REVIEW CRITERIA

Each application  is reviewed independently in accordance with the NSF Merit Review Criteria, Intellectual Merit and Broader Impacts (see Appendix I), using  all available information in the application. Broader Impacts may be accomplished through the research itself, through  activities directly related to specific research plans, or through other activities  conducted by the applicant.  NSF values the  advancement of scientific knowledge and activities that contribute to achievement of   societally relevant outcomes that include, but are not limited to: full  participation of women, persons with disabilities, veterans, and underrepresented   minorities in science, technology, engineering, and mathematics (STEM); improved   STEM education and educator development at any level; increased public scientific  literacy and public engagement with science and technology; improved well-being of  individuals in society; development of a diverse, globally competitive STEM workforce;  increased partnerships between academia, industry, and others; improved national   security; increased economic competitiveness of the US; and enhanced infrastructure for   research and education.

### Merit Review and GRFP

*Note: You are reviewing applications, not proposals.*

Holistic review allows flexible, individualized  assessment of experiences, academic achievements, interests, and competencies that demonstrate the applicant's potential for significant  research achievements in STEM and STEM education. For the NSB-approved review criteria of Intellectual Merit and Broader Impacts, panelists may consider:

**Intellectual Merit**: the potential of the applicant to advance knowledge based  on a holistic analysis of the complete application, including the *Personal, Relevant Background, and Future Goals Statement*, the *Graduate Research Plan Statement*, the strength of the academic record, research, professional, and internship experiences, publications/presentations, and letters of reference.

**Broader Impacts**: the  potential of the applicant to benefit society and contribute to the achievement of specific,  desired societal outcomes based on a holistic analysis of the complete application,  including from personal experiences, professional experiences, educational experiences and  future plans.

Panelists assign a rating for each review criterion (*Excellent, Very  Good, Good, Fair*, or *Poor*), providing constructive written comments that support each  assigned rating (one for Intellectual Merit and one for Broader Impacts), and write a summary statement. Panelists are evaluating individuals based on the  evidence provided in the applications, not research proposals. Panelists must not refer to specific components of  the application, such as GPA or individual reference letters; nor should they quote extensively from the application or

letters. Under no circumstances should they identify the writer of a particular comment in a reference letter (by name or by advisor role; regardless of whether the comment is negative or positive). They must rate applications using the explicit review criteria and avoid judgments unsupported by evidence.

Panelists should be aware of how unconscious assumptions might influence evaluations, and make effort to avoid such influence, or the perception thereof, in the evaluation of the applications and in their comments.

**Review comments and summary should be addressed to the applicant. The applicant will receive the comments and summary statement from each of their reviewers exactly as written**, so these should be evaluative (rather than repeating material from the application), constructive, thorough, non-discriminatory, and informative to unsuccessful applicants who want to understand their outcomes.

General guidance for applying the two merit review criteria can be found at the following: http://www.nsf.gov/bfa/dias/policy/merit_review/mrfaqs.jsp

Panelists will also provide to NSF one overall, numerical score (1-50) for each application (see details below). This score is not provided to the applicant and should not be referred to in the comments. Panelists will derive this score from the Intellectual Merit and Broader Impacts assessment of each application. Both Intellectual Merit and Broader Impacts are to be given full consideration during the review and decision-making processes; each criterion is necessary, but neither by itself is sufficient.


## ELIGIBLE APPLICANTS

Applicants must certify that they meet the GRFP eligibility criteria provided in the Solicitation (NSF **16-588)** at https://www.nsf.gov/pubs/2016/nsf16588/nsf16588.htm.). If panelists encounter applications they think might be ineligible based on the eligibility criteria in the GRFP Solicitation and their professional judgment, they should bring the application to the attention of an NSF Program Director by clicking *Contact Program Staff* and then *Eligibility Review* on the home screen of the GRFP Review Site. Panelists should give a brief reason for requesting an eligibility review. An NSF Program Director will review these applications and determine eligibility. Section IV of the GRFP Solicitation has complete eligibility information.

## GRFP ACADEMIC LEVELS

Applications should be read and reviewed in order of academic level, starting with Level 1 and progressing through Level 4. There are two deadlines for submitting reviews:

Level 1: **two weeks** (10 business days) before first virtual panel day

Levels 2, 3, 4: **one week** (5 business days) before first virtual panel day

Reading and reviewing by level makes it easier to be mindful of the varied degree of preparation among the graduate and undergraduate applicants. GRFP aims to recruit and retain students early in their STEM research careers, so it is essential to give full consideration to Level 1 applicants, whose potential will look different than that of applicants who have already begun their graduate study. Level 1 applicants will be discussed separately on Panel Day 1 allowing panelists to adjust for this variation when rating applications on a common scale. The levels are as follows:

**Level 1**: Baccalaureate degree in progress or completed with no post-baccalaureate graduate study. The applicant is either in the final year as an undergraduate and will have completed the baccalaureate degree in time to enroll in a research-based STEM graduate program by Fall 2018, or has the baccalaureate degree and has never been enrolled in a graduate program. Includes applicants in the last year of a five-year joint baccalaureate-master's degree program.

**Level 2**: Graduate students in the beginning of their first year of graduate school. The applicant has completed the baccalaureate degree and began graduate study in Fall 2017.

**Level 3**: Graduate students who have completed no more than the equivalent of 12 months of full-time graduate study, who are usually in the beginning of their second year of graduate school, and who may have completed a master's degree in a joint baccalaureate-master's degree program.

**Level 4**: Applicants who have completed more than twelve months of graduate study may be considered eligible if they have had an interruption in graduate study of at least two consecutive years directly prior to November 2017 (they are not yet re-enrolled in graduate study at the time they submit the GRFP application). To be eligible, applicants must have completed no additional graduate study after the interruption by August 1, 2017. **Applicants must address the reasons for the interruption in graduate study in the Personal, Relevant Background and Future Goals Statement.**


## QUALITY GROUPS

The panel places each applicant in one of three Quality Groups defined as follows:

- Quality Group 1 (QG1) – *Highly Meritorious*. Applicants placed in QG1 are outstanding and recommended to receive fellowship awards, subject to NSF review and approval.

- *Quality Group 2 (QG2) – Meritorious*. Of somewhat lower quality than those placed in QG1, and of substantially equal merit within the group. These applicants are considered worthy of NSF fellowship support by the panel. Applicants from QG2 who do not receive awards receive Honorable Mention, subject to NSF review and approval.

- *Quality Group 3 (QG3) – Not Recommended*. Of lower overall merit than applicants placed in QG1 and QG2. Applicants in QG3 do not receive awards or Honorable Mention, subject to NSF review and approval.

NSF reviews the panel recommendations before determining fellowship offers.

**APPLICATION EVALUATION**

Panelists score applications on a common numerical scale (1-50) in addition to rating the merits of the Intellectual Merit (IM) and Broader Impacts (BI) of each application via checkboxes labeled *Excellent*, *Very Good, Good, Fair*, and *Poor* (see Table 1 below for the relationships among these assessments). The score is used <u>only</u> to rank applicants for the purposes of establishing Quality Groups. **These scores are not shared with the applicants and should not be mentioned in the review comments.** The comments and the checkbox ratings for IM and BI are provided to each applicant. **The ratings should be consistent with the score in providing the rationale for fellowship recommendations to NSF.**

Table 1. Relationships among Quality Groups, Ratings and Raw Scores

| | | |
|---|---|---|
| **QG 1– Highly Meritorious**. Recommended for a fellowship award | Excellent (E) | 50 – 40 |
| **QG 2 – Meritorious**. Recommended for a fellowship award or for Honorable Mention. Applicants from QG2 who do not receive awards receive Honorable Mention. | Very Good (V) | 39 – 30 |
| **QG 3 – Not Recommended** | Good (G) <br> Fair (F) <br> Poor (P) | 29 – 20 <br> 19 – 10 <br> 9 – 1 |

\* Panelists select the appropriate Intellectual Merit and Broader Impact rating checkboxes that correspond with their evaluation of the application. The individual ratings for the two merit review criteria may differ.

\*\* The raw score reflects the overall rating for the application, taking into account both the Intellectual Merit and the Broader Impacts of the application. Both Intellectual Merit and Broader Impacts are to be given full consideration during the review and decision-making processes; each criterion is necessary, but neither by itself is sufficient.

The written comments and the deliberations by panelists serve as recommendations to NSF program officers.

1. *Raw scores*

The numeric scale is from 50 (*Excellent*) through 1 (*Poor*). These raw scores are reported in whole numbers only. **Panelists are encouraged to use the full range from 1 to 50.**

Panelists are free to modify the raw scores given to a particular applicant after discussions and consideration of the Ranking Report. Modifying raw scores may cause an applicant to move up or down in the ranking, based on the assessment of the applicant's demonstrated ability and potential for success relative to that of other reviewed applicants at comparable stages of their research training.

Scoring ranges and their typical relationships to qualitative ratings and Quality Group placements are as follows:
**50-40** Applicants with *Excellent* in the IM checkbox and *Excellent* in the BI checkbox on the rating sheet are likely to be placed in Quality Group 1.

**39-30** Applicants with a rating no lower than *Very Good* in both the IM or BI checkboxes

are likely to be placed in Quality Group 1 or Quality Group 2.

**29-20** Applicants with a rating of *Good* in either the IM or the BI checkbox are likely to be placed in Quality Group 3.

**19-10** Applicants with a rating of *Fair* in either the IM or the BI checkbox are likely to be placed in Quality Group 3.

**9-1** Applicants with a rating of *Poor* in either the IM or the BI checkbox are likely to be placed in Quality Group 3.

**<u>Z-scores:</u>** Each panelist will review 25-30 applications. Panelists may choose to use the available scoring range differently (e.g., some panelists are not comfortable giving a rating of *Poor* to an applicant and they do not use the whole scale). To normalize these individual scoring tendencies, the raw scores are converted into z-scores. A z-score of 0 represents the average score given by that particular panelist. (For a definition, detailed explanation, and example calculations, see Appendix III.)

Each application is reviewed by three panelists and receives three z-scores, one from each panelist. Significant differences among the three z-scores suggest that the evaluations by the three panelists vary considerably and may benefit from further discussion.

2. *Ratings*

Ratings are assigned based on the following definitions:

- *Excellent*: Highly meritorious; recommended for a fellowship award.
- *Very Good*: Meritorious; recommended for a fellowship award or for Honorable Mention.
- *Good*: Not recommended for a fellowship award
- *Fair*: Not recommended; application lacking in one or more critical aspects; key issues need to be addressed.
- *Poor*: Not recommended; application has serious deficiencies.

Typical relationships among Quality Groups, qualitative ratings, and raw scores are shown in Table 1. These relationships will vary for panelists who do not use the full rating scale. Using more of the scale makes the scoring more meaningful, as well as making it easier for panelists to adjust their scores up or down after discussions with other panelists during the virtual panel days.

3. *Comments*

Comments provide helpful insights into the panelist's judgment of the quality of an application. For each application, panelists must provide comments on the Review Sheet (Appendix I) for Intellectual Merit, Broader Impacts, and a summary statement reflecting the strengths and weaknesses in the overall assessment of the application. These comments provide important information to NSF as well as constructive feedback to the applicants. Comments should help applicants understand the ratings they receive and their overall outcome, as well as be useful for improving their applications, should they be eligible to apply in a later competition.

**APPLICATION REVIEW PROCESS**

The GRFP panel review process is entirely online. Panelists have several weeks to read applications and prepare reviews including scores, ratings, and review comments. Panels then meet virtually for discussion, adjustments of reviews/scores, and determination of a final ranking and placement into Quality Groups of all applications in their panel. The diagram shown in Appendix II provides an overview of the review activities.

## *Review Activities*

The review activities consist of the following:

(1) Panelist orientation session and technology testing via WebEx prior to panelists' access to applications;

(2) Submission of Level 1 reviews <u>no later than </u>two weeks prior to the start of the virtual panel; and

(3) Submission of Levels 2, 3, and 4 reviews <u>no later than </u>one week prior to the start of the virtual panel; and

(4) Virtual panel discussion of applications.

*Step 1: Panelist orientation session via WebEx*

Panelist orientation sessions familiarize panelists with the application materials, merit review criteria, the rating scale, and the panel review process. **All panelists must participate in one panelist orientation session**, which will be led by NSF Program Directors.

The panelist orientation session will discuss the following topics:
- Application evaluation
    - various factors to be used in judging merit for each applicant
    - examples of application content that satisfy the NSF merit review criteria.
- Overall evaluation
    - balance of quantitative and qualitative indicators of merit in a holistic review
    - use of the complete range of the rating scale to establish Quality Groups
    - relationships between the merit review ratings, the numeric scores, z- scores and Quality Group allocations.

The panelist orientation session is not expected to result in conforming ratings among the panel members; rather, the purpose is to review the factors considered accurate measures of the merit that NSF seeks to recognize.

*Step 2: Review Assigned Applications and Complete Ratings*

Following the panelist orientation session, panelists will be given access to their assigned

applications through the GRFP Review Site. After checking the names and institutions of the applicants for any conflicts of interest, panelists will review their assigned applications by completing each review sheet. <u>Panelists should first read and submit reviews for all Level 1 applications (due two weeks before the panel)</u>, followed by all Level 2, then Level 3, and finally, Level 4 applications (due one week before the panel). Most panelists will receive one or more additional review requests in the days before the panel, if other panelists are unable to provide a review (e.g., due to COI).

During the review process, a panelist may encounter an interdisciplinary application with a field of study that would benefit from the input of a panelist on another panel. In such cases, the panelist should notify NSF by clicking **Contact Program Staff** and then **Outside Review** on the home screen of the GRFP Review Site. An outside review allows a panelist with expertise in the appropriate field to provide a review of the Intellectual Merit and Broader Impacts of the application, with the application remaining in the original panel for final review. The comments and score prepared from the outside review are provided to the panel for consideration, but outside reviews are not factored into the ranking of the application.

In addition, during the review process a panelist may feel that their assessment of an application might benefit significantly from discussion with their co-reviewers. In this case, the panelist may nominate an application for potential discussion during the virtual panel by activating the corresponding check box in the online review form (see Appendix I). GRFP encourages the use of this mechanism, however, panelists should keep in mind the large volume of applications and limited panel duration.

**NSF GRFP Program Directors can be contacted during the online review process.**

NSF Program Directors are responsible for resolving any and all issues that may arise during the online review period and during the virtual panel meeting.

*Step 3: Virtual panel discussion of applications*

**All panelists must complete their assigned reviews one week before the virtual panel convenes, and should try to complete reviews of any late assignments as soon as possible.** This is necessary for deliberations during the virtual panel days to go smoothly. Panel dates can be found in the panelist invitation email.

The panel review process consists of the following activities conducted during two days of virtual panels.

**<u>Day 1:</u>**

***Consider and discuss Day 1 Ranking Report (with focus on Level 1 applications)***

The Day 1 Ranking Report lists applications in ranked order on the basis of average z-scores, showing the three z-scores and Quality Group placement for each application. The discrepancy (range) between the highest and lowest z-scores is highlighted in color; high discrepancies help identify applications for discussion. Raw numerical scores are converted to z-scores as explained previously and in Appendix III (the z-scores normalize

variances in raw scores given by the three panelists assigned to an application.  An NSF program director leading the panel will share a list of applications that are affiliated with discrepant z-scores and may have been nominated for discussion by several panelists during the review period.

During Day 1, the whole panel will participate in discussions of Intellectual Merit and Broader Impacts of Level 1 applications. One  highly meritorious and one less meritorious application will be discussed to prepare panelists to have productive discussions during virtual breakout sessions. Then, all of the panelists who are co-reviewers on applications listed for discussion will enter smaller audio-only breakout sessions. Panelists who have not reviewed an application currently being discussed (so are not needed currently for another breakout session) will be invited to listen in and ask questions. Each breakout session discussion will take approximately 10-12 minutes. Reviewers may, but are not required to, change their reviews including scores and ratings based on these discussions; reviewers are asked to read one another's reviews and discuss any errors or misinterpretations of an application. There is no need for consensus; differences of opinion may remain (as reviewers weight factors differently in holistic review), but reviewers should strive to reach a shared understanding of the application's merits. The Program Directors will be able to join virtual breakout sessions, help moderate discussions, and answer questions.

After a panel completes evaluation of all Level 1 applications on Day 1, panelists may proceed to discussion of Level 2 applications (etc.).

## Day 2:

### *Consider and discuss the Day 2 Ranking Report*

The Day 2 Ranking Report includes changes made during Day 1, listing all applications in ranked order on the basis of average z-scores, with the three z-scores and Quality Group placement for each applicant. The panel will follow the same procedures as on Day 1 for the remaining applications.

The recommendations from panelists' reviews and scoring, along with applicants' placement into Quality Groups, are advisory to NSF for use in the selection of Fellows and Honorable Mention recipients.

### *Flag high potential applicants*

Each panelist will have the opportunity to identify up to three applicants from Quality Group 2 whom they consider to have particularly high potential; for each flagged application, they must provide a comment about why they are nominating these applicants for further consideration. NSF will consider these recommendations when selecting QG2 applicants for awards.

### *Provide feedback to NSF*

Panelists will be asked to provide feedback to NSF through the *Panelist Survey*, completed through the GRFP Review Site. The Panelist Survey is an important part of the  panelist's

service obligations, as it informs the NSF about how to improve the GRFP application review and panel process.

## PANEL OPERATIONS

### Program Director Responsibilities
NSF Program Directors attending the GRFP panels provide leadership and guidance to panelists during the virtual panel review. Responsibilities include:

- providing administrative oversight of the panel review process
- moderating panel discussions
- clarifying NSF policies and protocols
- answering questions about conflict of interest rules of the Foundation
- ensuring integrity in the merit review of GRFP applications
- monitoring discrepancies in panelists ratings and encouraging panelists to discuss discrepancies and reach a shared understanding
- encouraging discussion and ensuring all panelists have the opportunity to voice their opinions during deliberations

### Virtual Panel Facilitator

The Virtual Facilitator is an administrative staff person who assists the Program Directors during the virtual panels. Responsibilities include:

- monitoring panelist virtual panel check-in and attendance
- monitoring the WebEx chat box for panelist questions
- assisting panelists with virtual panel operations (audio, video functionality, etc.)
- facilitating breakout session formation and termination
- monitoring FastLane sign-in for panelist compensation

## POST-PANEL ACTIVITIES – SELECTION OF FELLOWSHIP RECIPIENTS

NSF determines the successful applicants from the recommendations of the panels, with fellowships and honorable mention offered based on the GRFP portfolio within the context of NSF's mission.

NSF will publish lists of Awardees and Honorable Mention recipients on the GRFP web site at **http://www.fastlane.nsf.gov/grfp/** by early April, 2018.

# Appendix I

## Application Review Form

National Science Foundation (NSF) seeks to recognize and support outstanding graduate students who are pursuing research-based master's and doctoral degrees in science and engineering. Reviews play a key role in the NSF's evaluation of GRFP applications.

Please provide **both** written comments in response to each criterion, as well as a summary rating on this Application, using the **Merit Review Criteria**.

**Ratings** - Panelists must select the appropriate Intellectual Merit and Broader Impact rating checkbox that corresponds with their evaluation of the application. Note that the individual ratings for each of the criteria may differ.

**Excellent**      Highly Meritorious; recommended for a fellowship award.
**Very Good**     Meritorious; Recommended for a fellowship award or for
                          Honorable Mention.
**Good**             Not Recommended for a fellowship award
**Fair**              Not Recommended; application lacking in one or more critical aspects;
                          key issues need to be addressed.
**Poor**             Not Recommended; application has serious deficiencies.

The following elements should be considered in the review of fellowship applications for both criteria:
1. What is the potential for the proposed activity to
   a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
   b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or institution to conduct the proposed activities?
5. Are there adequate resources available (either at the home institution or through collaborations) to carry out the proposed activities?

**Merit Review Criteria and GRFP**

Panelists evaluating applications submitted to the Graduate Research Fellowship Program may consider the following with respect to the **Intellectual Merit Criterion**: the potential of the applicant to advance knowledge based on a holistic analysis of the complete application, including the personal, relevant background, future goals statement, graduate research statement, strength of the academic record, description of previous research experience or publication/presentations, and references. Panelists may consider the following with respect to the **Broader Impacts Criterion**: the potential of the applicant for future broader impacts as indicated by personal experiences, professional experiences, educational experiences and future plans.

Below is the Application Review Form. The parts highlighted in yellow are what the applicant will receive as feedback. Your qualitative ratings and comments will be provided verbatim to the applicant.

| | Fields marked with a red asterisk must be complete before saving. Highlighted fields denote fields sent to the applicant. All other fields are for NSF internal use only. | |
|---|---|---|
| | **Save** | **Cancel** |
| Intellectual Merit Rating* | ○ Excellent ○ Very Good ○ Good ○ Fair ○ Poor <br> In the context of the five review elements, please evaluate the strengths and weaknesses of the application with respect to intellectual merit. | |
| Intellectual Merit Comments* | | |
| Broader Impacts Rating* | ○ Excellent ○ Very Good ○ Good ○ Fair ○ Poor <br> In the context of the five review elements, please evaluate the strengths and weaknesses of the application with respect to broader impacts. | |
| Broader Impacts Comments* | | |
| Summary Statement* | | |
| Overall Score* | <br> Score must be a whole integer between 1 – 50. | |
| Additional Discussion | ☐ Use this checkbox if you would like to propose this application for potential discussion. | |
| Completion Tracking | ☐ You may use this checkbox as a reference tool to track completion of your reviews. | |
| | Fields marked with a red asterisk must be complete before saving | |
| | **Save** | **Cancel** |

## Appendix II
## Application Review Process

**Pre-Panel Activities**

**Virtual Panel Activities**
**Panel Day 1**

Panelists attend Orientation Webinar

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Assigned applications reviewed online

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Panelists enter scores and comments using the GRFP Review Site Panelists may propose selected applications for discussion with co-reviewers

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Z-scores calculated and Day 1 Ranking Report produced

Panelists review Day 1 Ranking Report and Quality Group placements (Level 1 focus)

↓

Panel deliberations

↓

Panelists may adjust scores and comments

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Updated Ranking Report produced before Day 2

**Panel Day 2**

↓

Panelists review Day 2 Ranking Report

↓

Panel deliberations

↓

Panelists may adjust scores and comments

↓

Panelists flag up to 3 high potential applicants

NSF determines and announces GRFP awardees

( **END** )

# Appendix III

## Z-scores

Quality Group placements are assigned by arranging the reviewed applications by their average z-scores, which normalize for each reviewer's overall scoring tendency, and should be consistent with the comments and qualitative ratings assigned by reviewers to the Intellectual Merit and the Broader Impacts criteria. The z-scores for each panelist are calculated dynamically in the GRFP Review Site from the scores panelists give to applications. They provide a measure of how far an individual rating deviates from the mean of all ratings given by an individual panelist. The z-scores are calculated automatically from the numerical scores entered by a panelist using the following formula:

$$Z = \frac{Score - Mean}{SD}$$

z:        z-score
Score:  Raw numerical score for one application by individual
panelist
Mean:  Mean of individual panelist's scores
SD:      Standard deviation of individual panelist's scores

The formula produces a z-score that is positive for applications rated higher (better) than the mean, and one that is negative for applications rated lower (worse) than the mean.

For example, Panelist A rates applications with a mean rating of 30, and a standard deviation of their ratings of 12. Applicant 01 receives a rating of 50 from panelist A, so the z-score would be 1.67, while Applicant 02 gets a rating of 20 from panelist A, and has a z-score of -0.83.

Thus, a z-score of 1.50 is better than a z-score of 1.00 or -1.50. The average z-score for an application, provided in the Ranking Reports, is determined by adding the individual reviewers' z-scores and dividing by the number of reviewers.

The goal of z-scores is to reduce problems stemming from individual grading tendencies in using the Rating Scale (normalizing "tough" vs. "easy" graders), and thus ensures confidence in the fairness of the review process and panel decisions. The z-scores do not provide an absolute assessment of an individual application; rather, they provide a relative measure of how individual applications compare to others scored by the same panelist. Further, z-scores serve to compensate for degrees of difference in the ways that panelists assign scores to the same application. The z-scores will be rounded to 2 decimal places for ranking purposes, but small differences (i.e., 1.02 vs. 1.05) are not meaningful, especially when panelists do not use the full scale. For best results with z-scores, panelists are strongly encouraged to use the full extent of the 1-50 rating scale.

# Appendix IV

## GRFP Review Timeline



| Aug 2017 | Sept 2017 | Oct 2017 | Nov 2017 | Dec 2017 | Jan 2018 | Feb 2018 | Mar 2018 |
|---|---|---|---|---|---|---|---|

Receive Applications (FastLane) Evaluate for compliance and completeness

Panelist Technology Testing Sessions (WebEx)

Panelist Orientation Sessions (WebEx)

Application Review Period (GRFP Review Site)

Convene Virtual Review Discussions (WebEx, GRFP Review Site)

Award Decision Meetings (Internal)

Announce Awardees