

Broadening Participation Research Initiation Grants in Engineering 2013 (BRIGE)

PROGRAM SOLICITATION

NSF 13-534

REPLACES DOCUMENT(S):
NSF 11-576



National Science Foundation

Directorate for Engineering
Division of Chemical, Bioengineering, Environmental, and Transport Systems
Division of Civil, Mechanical and Manufacturing Innovation
Division of Electrical, Communications and Cyber Systems
Engineering Education and Centers
Industrial Innovation and Partnerships

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

April 29, 2013

IMPORTANT INFORMATION AND REVISION NOTES

A revised version of the *NSF Proposal & Award Policies & Procedures Guide (PAPPG)*, [NSF 13-1](#), was issued on October 4, 2012 and is effective for proposals submitted, or due, on or after January 14, 2013. Please be advised that the guidelines contained in [NSF 13-1](#) apply to proposals submitted in response to this funding opportunity. Proposers who opt to submit prior to January 14, 2013, must also follow the guidelines contained in [NSF 13-1](#).

Please be aware that significant changes have been made to the PAPPG to implement revised merit review criteria based on the National Science Board (NSB) report, [National Science Foundation's Merit Review Criteria: Review and Revisions](#). While the two merit review criteria remain unchanged (Intellectual Merit and Broader Impacts), guidance has been provided to clarify and improve the function of the criteria. Changes will affect the project summary and project description sections of proposals. Annual and final reports also will be affected.

A by-chapter summary of this and other significant changes is provided at the beginning of both the [Grant Proposal Guide](#) and the [Award & Administration Guide](#).

Please note that this program solicitation may contain supplemental proposal preparation guidance and/or guidance that deviates from the guidelines established in the [Grant Proposal Guide](#).

As noted in **Section II. Program Description** and **Section V. Proposal Preparation and Submission Instruction**, plans for broadening participation and for activities related to diversity and inclusion must be an integral part of the Project Description and not a separate document in the Special Information and Supplementary Documentation section.

As noted in **Section IV. Eligibility Information**, PI eligibility restrictions have been modified. The PI may not be a Principal Investigator or Co-Principal Investigator on an NSF-funded research grant that has an award date prior to that of the BRIGE award.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Broadening Participation Research Initiation Grants in Engineering (BRIGE)

Synopsis of Program:

The **Broadening Participation Research Initiation Grants in Engineering (BRIGE)** solicitation is designed to promote the development of early career faculty who will become champions for diversity and broadening participation of underrepresented groups in engineering throughout their careers. BRIGE awards will enable early career faculty to integrate effective diversity and broadening participation strategies in their engineering research, education, and innovation activities.

Throughout this solicitation, the term underrepresented groups will refer to and include the following: women, persons with disabilities, and ethnic/racial groups that are in the minority in engineering, which include African Americans, Hispanics, Native Americans, Alaska Natives, and Native Pacific Islanders. Proposals from early career faculty who are members of underrepresented groups as well as from Minority Serving

Institutions (including Historically Black Colleges and Universities, Hispanic Serving Institutions, Tribal Colleges and Universities, and Predominantly Black Institutions) are especially encouraged.

"**WEBINAR:** A webinar will be held within 6 weeks of the release date of this solicitation to answer any questions about the solicitation. Details will be posted on the Broadening Participation in Engineering (BPE) website: http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504870&org=EEC&from=home as they become available."

Cognizant Program Officer(s):

Please note that the following information is current at the time of publishing. See program website for any updates to the points of contact.

- Richard N. Smith, telephone: (703) 292-8071, email: rsmith@nsf.gov
- Lawrence S. Goldberg, ECCS, telephone: (703) 292-8339, email: lgoldber@nsf.gov
- Ted A. Conway, CBET, telephone: (703) 292-7091, email: tconway@nsf.gov
- Juan E. Figueroa, IIP, telephone: (703) 292-7054, email: jfiguero@nsf.gov
- Mary Toney, CMMI, telephone: (703) 292-7008, email: mtoney@nsf.gov

Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.041 --- Engineering

Award Information

Anticipated Type of Award: Standard Grant

Estimated Number of Awards: 25 to 30 awards

Anticipated Funding Amount: \$5,000,000 anticipated program budget for FY 2013 pending the availability of funds. The awards are limited to a maximum of \$175,000 in total (direct plus indirect) costs for a duration of 24 months. Durations may be longer if circumstances warrant and are justified.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.

PI Limit:

Only one investigator per proposal is allowed; co-principal investigators and senior personnel are not permitted.

See **Additional Eligibility Information** section for further information.

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI:

One per solicitation.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable
- **Preliminary Proposal Submission:** Not Applicable
- **Full Proposals:**
 - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg.
 - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)

B. Budgetary Information

- **Cost Sharing Requirements:** Inclusion of voluntary committed cost sharing is prohibited.
- **Indirect Cost (F&A) Limitations:** Not Applicable

- **Other Budgetary Limitations:** Not Applicable

C. Due Dates

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):
April 29, 2013

Proposal Review Information Criteria

Merit Review Criteria: National Science Board approved criteria apply. Additional merit review considerations apply. Please see the full text of this solicitation for further information.

Award Administration Information

Award Conditions: Standard NSF award conditions apply.

Reporting Requirements: Standard NSF reporting requirements apply.

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I. INTRODUCTION

The National Science Foundation (NSF) through its Divisions and Directorates has as one of its goals to educate and prepare a diverse and able Science, Technology, Engineering, and Mathematics (STEM) workforce who are motivated and prepared to participate at the frontiers of research and innovation. The Engineering Directorate (ENG) supports the development of a diverse and well-prepared workforce of engineering graduates, particularly those with advanced degrees, and contributes to enhancing the ability of early career faculty members to succeed in their careers as researchers, innovators, and educators through its **Broadening Participation in Engineering Program (BPE)**.

The **Broadening Participation Research Initiation Grants in Engineering (BRIGE)** solicitation is one element of the BPE program and is specially designed to promote increased participation of early career faculty in all fields of engineering research and to support the integration of effective diversity and broadening participation strategies in their engineering research, education, and innovation activities. By promoting the development and success of early career faculty with a passion for broadening participation, ENG expects that BRIGE award winners will become champions for diversity and broadening participation of underrepresented groups in engineering throughout their careers.

II. PROGRAM DESCRIPTION

The BRIGE solicitation encourages proposals that are innovative and potentially transformative in terms of engineering research,

which are strengthened through careful integration of effective activities to promote broadening participation. BRIGE awards are for beginning investigators (see Section IV: Additional Eligibility Information below) to undertake activities such as exploratory investigations, acquisition of preliminary data, and development of collaborations. Investigators are encouraged to include discussion of future long-term research goals, which include incorporation of broadening participation, as described in this solicitation, as a sustainable component of their scholarly enterprise. Research proposed in this program must be within the scope of areas supported by programs within the Engineering Directorate.

The broadening participation plan in BRIGE proposals should describe activities that will broaden the participation of individuals from underrepresented groups in the engineering disciplines supported by the Engineering Directorate. These activities should involve engineering research projects that use innovative ways to attract and retain members of underrepresented groups to careers in engineering, especially at the advanced degree level. The proposed research should describe how these broadening participation activities will strengthen the quality of the research and how the research activities will promote diversity. PIs will be expected to develop a capability to serve as role models for promotion of broadening participation and as mentors for members of underrepresented groups that will make up the new generation of engineers.

BRIGE is part of the strategy of the Engineering Directorate to make its programs more inclusive in the future and to contribute to a diverse professoriate. One measure of success of the program will be the number of future proposals received and awarded by ENG to BRIGE grantees. Another measure will be the extent to which BRIGE supported activities are integrated into the Broader Impacts component of future proposals, including CAREER.

In preparing the proposal, PIs should refer carefully to Section V.A. with respect to the organization of the proposal. In addition, PIs should be aware that reviewers will be asked to consider (a) the integration of broadening participation into the research activities and (b) the potential of the research initiation activities to produce sufficient preliminary results to serve as the basis for future competitive research proposals to ENG, consistent with the long-term research and education goals of the PI. Awardees will be expected to include the impact of their projects in these two areas within the required Annual and Final Reports.

Early career faculty who are themselves members of underrepresented groups as well as from Minority Serving Institutions (including Historically Black Colleges and Universities, Hispanic Serving Institutions, Tribal Colleges and Universities, and Predominantly Black Institutions) are especially encouraged to apply.

III. AWARD INFORMATION

Anticipated Type of Award: Standard Grant. The Directorate for Engineering expects to invest \$5,000,000 in the BRIGE program for FY 2013 and to fund 25 to 30 grants. The number of awards is subject to the availability of funds. The awards are limited to a maximum of \$175,000 in total (direct plus indirect) costs for a duration of 24 months. Durations may be longer if circumstances warrant and are justified.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.

PI Limit:

Only one investigator per proposal is allowed; co-principal investigators and senior personnel are not permitted.

See **Additional Eligibility Information** section for further information.

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI:

One per solicitation.

Additional Eligibility Info:

Principal investigators are eligible to apply to this BRIGE solicitation only if **all** of the following criteria are met at the time of submission deadline. The Principal Investigator:

- must be a **Citizen or Permanent Resident** of the United States;
- must hold a primary appointment in an engineering department;
- must be a in a full time, tenure-track faculty position for less than three years. This includes tenure track positions at other universities prior to the current appointment. Official leaves of absence (illness, family, etc.) may be subtracted from the total time in the tenure track position, as certified by the PI's department head/chair in the required letter of support, which is included in the Special Information and Supplementary Documentation section of the proposal.
- In addition, **at the time that an award is made**, the PI may not be a PI or Co-PI on any awarded National Science Foundation research grant with the following exceptions:
 - Instrumentation, education, workshop, and other non-research awards
 - Doctoral dissertation improvement award,
 - A post-doctoral research award such as a SEES Fellowship,

- o A Graduate Research Fellowship or similar fellowship awards from the NSF.
- o REU or RET site awards.
- o SBIR or STTR awards that were made while the PI was in industry

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal Preparation Instructions: Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from <mailto:pubs@nsf.gov>. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from <mailto:pubs@nsf.gov>.

Important Proposal Preparation Information: FastLane will check for required sections of the proposal, in accordance with *Grant Proposal Guide* (GPG) instructions described in Chapter II.C.2. The GPG requires submission of: Project Summary; Project Description; References Cited; Biographical Sketch(es); Budget; Budget Justification; Current and Pending Support; Facilities, Equipment & Other Resources; Data Management Plan; and Postdoctoral Mentoring Plan, if applicable. If a required section is missing, **FastLane will not accept the proposal.**

Please note that the proposal preparation instructions provided in this program solicitation may deviate from the GPG instructions. If the solicitation instructions do not require a GPG-required section to be included in the proposal, insert text or upload a document in that section of the proposal that states, "Not Applicable for this Program Solicitation." Doing so will enable FastLane to accept your proposal.

Potential applicants are strongly encouraged to read this program solicitation in its entirety, as well as the Frequently Asked Questions (FAQs), before sending inquiries to the program contacts listed in Section VIII of this solicitation.

PI Webinars: Eligible parties intending to submit a full proposal to BRIGE for FY2013 are encouraged to participate in a 1-hour Webinar that will be webcast after the release of this solicitation, approximately 60 days prior to the proposal due date. Several Webinars will be offered, and specific dates and contact information for registration will be provided on the BRIGE webpage.

In addition to following the general format contained in the GPG or NSF Grants.gov Application Guide, proposals submitted in response to this program solicitation must also adhere to the following special instructions:

Cover Sheet:

The title of the research project must begin with "**BRIGE:**" in the title section of the NSF cover sheet.

The primary division for submission is Engineering Education and Centers (EEC). The secondary unit of consideration should be the ENG program within the CMMI, CBET, ECCS, or EEC division with which your proposed research is most closely affiliated.

Co-principal investigators are not permitted.

Project Summary (one-page limit):

Provide a succinct summary of the research objectives of the proposed BRIGE award and how these will be integrated with broadening participation objectives. As required for all proposals to the National Science Foundation, the Project Summary must include a brief summary of the **Intellectual Merit** of the proposed activities, including the potential for the proposed activities to be transformative. The Project Summary must also summarize the **Broader Impacts** of the proposed work, such as benefits to society, dissemination of results, and development of infrastructure. In particular, the Broader Impacts statement should summarize how the proposed activity will **broaden participation** of underrepresented groups in engineering, as described in previous sections of this solicitation.

PIs are encouraged to review the revised guidance contained in the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), **NSF 13-1**, which has been provided to clarify and improve the function of the Intellectual Merit and Broader Impacts criteria.

Project Description (15 page limit, including tables, figures, and other visual supplements):

Provide a detailed statement of the proposed integrated research and broadening participation activities to be undertaken. It should contain

- A brief description of the PI's overall research and education goals, as well as specific details on how the PI plans to integrate broadening participation into those goals.
- A detailed description of the proposed research activities, including preliminary results and other appropriate background (if available).

- A description of proposed broadening participation activities and how they will broaden the participation of individuals from underrepresented groups in the disciplines supported by the Engineering Directorate, particularly with respect to advance degree programs and pathways to future careers in engineering research and development. The inclusion of an evaluation plan to determine the effectiveness of the proposed broadening participation activities is strongly encouraged.
- A clear indication of how broadening participation activities are integrated with the research and innovation objectives of the proposal, in a way that can lead to sustainability of those activities through the career of the PI.
- The relationship of the proposed activities to the PI's projected longer term research goals and how they will facilitate the development of subsequent research proposals.

Please note that per guidance in the GPG, the Project Description must contain, as a separate section within the narrative, a discussion of the broader impacts of the proposed activities. You can decide where to include this section within the Project Description.

Links to Websites of the PI or other sources of information may not be included.

References Cited: Refer to guidance in the GPG.

Biographical Sketch(es): Refer to guidance in the GPG.

Current and Pending Support: This is the required documentation of current and pending support described in the GPG. List the BRIGE proposal as Pending Support.

Budget (see below for limitations, and consult the GPG for instructions on budget preparation):

Prepare a realistic project budget that is consistent with the proposed activities not to exceed \$175,000 over 24 months. Durations may be longer if circumstances warrant and are justified.

- The PI is the only senior personnel who may be included in the budget.
- Collaboration with other scientists and/or researchers at other universities, from industry, or at national laboratories is encouraged. However, collaborators from those institutions may not receive support from BRIGE award funds.
- The Budget Justification (not to exceed three pages) should explain each line item for which funds are requested.
- Proposed budgets should include funds for the PI to attend a grantees meeting in Arlington VA.

Facilities and Equipment:

Provide a description of available facilities and priorities for its use, if applicable. Please note that this section is a required part of the proposal. If not applicable, the proposer should enter "Not applicable" in the Facilities, Equipment, and Other Resources section of the proposal.

Special Information and Supplementary Documentation:

- The proposal must include in this section a letter from the PI's department chair/head or dean, which will include confirmation of the following criteria: (1) The PI meets the eligibility requirements described in Section IV of the BRIGE solicitation, with specific reference to each element of those requirements; (2) the PI has access to facilities and support for the proposed activities from the submitting institution; (3) the proposed integration of research and broadening participation activities is consistent with the department chair's/head's or dean's assessment of a successful career plan for the PI.

Neglecting to include this letter at time of submission with each of the required components will result in the proposal being Returned Without Review.

- Letters of commitment or collaboration may be included, but letters of recommendation are not allowed.
- **Documentation of official Leave of Absence, if applicable.**
- A [Post-Doctoral Mentoring Plan](#), if post-docs will be supported.
- A [Data Management Plan](#).

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

C. Due Dates

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):
April 29, 2013

D. FastLane/Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

Detailed technical instructions regarding the technical aspects of preparation and submission via FastLane are available at: <https://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required electronic certifications within

five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane Website at: <https://www.fastlane.nsf.gov/fastlane.jsp>.

- **For Proposals Submitted Via Grants.gov:**

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: http://www07.grants.gov/applicants/app_help_reso.jsp. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

Submitting the Proposal: Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program for acknowledgement and, if they meet NSF requirements, for review. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF either as *ad hoc* reviewers, panelists, or both, who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal. In addition, Program Officers may obtain comments from site visits before recommending final action on proposals. Senior NSF staff further review recommendations for awards. A flowchart that depicts the entire NSF proposal and award process (and associated timeline) is included in the GPG as [Exhibit III-1](#).

A comprehensive description of the Foundation's merit review process is available on the NSF website at: <http://www.nsf.gov/bfa/dias/policy/meritreview/>.

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in [Empowering the Nation Through Discovery and Innovation: NSF Strategic Plan for Fiscal Years \(FY\) 2011-2016](#). These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

One of the core strategies in support of NSF's mission is to foster integration of research and education through the programs, projects and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students, and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the variety of learning perspectives.

Another core strategy in support of NSF's mission is broadening opportunities and expanding participation of groups, institutions, and geographic regions that are underrepresented in STEM disciplines, which is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

A. Merit Review Principles and Criteria

The National Science Foundation strives to invest in a robust and diverse portfolio of projects that creates new knowledge and enables breakthroughs in understanding across all areas of science and engineering research and education. To identify which projects to support, NSF relies on a merit review process that incorporates consideration of both the technical aspects of a proposed project and its potential to contribute more broadly to advancing NSF's mission "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." NSF makes every effort to conduct a fair, competitive, transparent merit review process for the selection of projects.

1. Merit Review Principles

These principles are to be given due diligence by PIs and organizations when preparing proposals and managing projects, by reviewers when reading and evaluating proposals, and by NSF program staff when determining whether or not to recommend proposals for funding and while overseeing awards. Given that NSF is the primary federal agency charged with nurturing and supporting excellence in basic research and education, the following three principles apply:

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals. These "Broader Impacts" may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.
- Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.

With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level, PIs are expected to be accountable for carrying out the activities described in the funded project. Thus, individual projects

should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.

These three merit review principles provide the basis for the merit review criteria, as well as a context within which the users of the criteria can better understand their intent.

2. Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board approved merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two merit review criteria are listed below. **Both** criteria are to be given **full consideration** during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria. ([GPG Chapter II.C.2.d.i.](#) contains additional information for use by proposers in development of the Project Description section of the proposal.) Reviewers are strongly encouraged to review the criteria, including [GPG Chapter II.C.2.d.i.](#), prior to the review of a proposal.

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge; and
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The following elements should be considered in the review 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 organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. NSF values the advancement of scientific knowledge and activities that contribute to achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, 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 United States; and enhanced infrastructure for research and education.

Proposers are reminded that reviewers will also be asked to review the Data Management Plan and the Postdoctoral Researcher Mentoring Plan, as appropriate.

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or Panel Review.

Reviewers will be asked to formulate a recommendation to either support or decline each proposal. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

A summary rating and accompanying narrative will be completed and submitted by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (GC-1); * or Research Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the *NSF Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer at least 90 days prior to the end of the current budget period. (Some programs or awards require submission of more frequent project reports). Within 90 days following expiration of a grant, the PI also is required to submit a final project report, and a project outcomes report for the general public.

Failure to provide the required annual or final project reports, or the project outcomes report, will delay NSF review and processing of any future funding increments as well as any pending proposals for all identified PIs and co-PIs on a given award. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through Research.gov, for preparation and submission of annual and final project reports. Such reports provide information on accomplishments, project participants (individual and organizational), publications, and other specific products and impacts of the project. Submission of the report via Research.gov constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report also must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

More comprehensive information on NSF Reporting Requirements and other important information on the administration of NSF awards is contained in the *NSF Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

VIII. AGENCY CONTACTS

Please note that the program contact information is current at the time of publishing. See program website for any updates to the points of contact.

General inquiries regarding this program should be made to:

- Richard N. Smith, telephone: (703) 292-8071, email: rsmith@nsf.gov
- Lawrence S. Goldberg, ECCS, telephone: (703) 292-8339, email: lgoldber@nsf.gov
- Ted A. Conway, CBET, telephone: (703) 292-7091, email: tconway@nsf.gov
- Juan E. Figueroa, IIP, telephone: (703) 292-7054, email: jfiguero@nsf.gov
- Mary Toney, CMMI, telephone: (703) 292-7008, email: mtoney@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.

IX. OTHER INFORMATION

The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In addition, National Science Foundation Update is a free e-mail subscription service designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Regional Grants Conferences. Subscribers are informed through e-mail when new publications are issued that match their identified interests. Users can subscribe to this service by clicking the "Get NSF Updates by Email" link on the [NSF web site](#).

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this new mechanism. Further information on Grants.gov may be obtained at <http://www.grants.gov>.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 55,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Arctic and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

Facilitation Awards for Scientists and Engineers with Disabilities provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at <http://www.nsf.gov>

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
- **For General Information** (NSF Information Center): (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**
 - Send an e-mail to: nsfpubs@nsf.gov
 - or telephone: (703) 292-7827
- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems

of Records, [NSF-50](#), "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and [NSF-51](#), "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Division of Administrative Services
National Science Foundation
Arlington, VA 22230

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