Online Resource Center for Ethics Education in Science and Engineering (ORCEESE)

PROGRAM SOLICITATION
NSF 13-558

REPLACES DOCUMENT(S):
NSF 10-547

National Science Foundation

Directorate for Social, Behavioral & Economic Sciences

Office of International and Integrative Activities

Directorate for Mathematical & Physical Sciences

Directorate for Computer & Information Science & Engineering

Directorate for Geosciences

Directorate for Engineering

Directorate for Biological Sciences

Directorate for Education & Human Resources

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

August 07, 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.

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.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Online Resource Center for Ethics Education in Science and Engineering (ORCEESE)

Synopsis of Program:

The program will fund one five-year award (2014-2018) to collect and curate multi-media materials (including research findings, pedagogical materials, and promising practices) for an online, state-of-the-art resource center that will support efforts by scientists and engineers to incorporate ethical issues and reasoning into their pedagogy and research. The online resource center should be creative, comprehensive, accessible, and evolving. The team will incorporate strategies and techniques to keep the Ethics Online Resource Center relevant and up to date.

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.

Linda Layne, SBE/SES, telephone: (703) 292-5026, email: eese-contacts@nsf.gov

- Ephraim P. Glinert, CISE/IIS, telephone: (703) 292-8930, email: eese-contacts@nsf.gov

- Jill L. Karsten, GEO/OAD, telephone: (703) 292-8500, email: eese-contacts@nsf.gov

- Carter Kimsey, BIO/DBI & OISE, telephone: (703) 292-8470, email: eese-contacts@nsf.gov

- Joseph A. Akkara, ENG/EFRI & MPS, telephone: (703) 292-4946, email: eese-contacts@nsf.gov

- Cassandra M. Dudka, OISE, telephone: (703) 292-7250, email: eese-contacts@nsf.gov

- Donna M. Riley, telephone: (703) 292-7107, email: eese-contacts@nsf.gov

- Susan Finger, telephone: (703) 292-4639, email: eese-contacts@nsf.gov

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

- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences
- 47.050 --- Geosciences
- 47.070 --- Computer and Information Science and Engineering
- 47.074 --- Biological Sciences
- 47.075 --- Social Behavioral and Economic Sciences
- 47.076 --- Education and Human Resources
- 47.079 --- International and Integrative Activities (IIA)

Award Information

Anticipated Type of Award: Cooperative Agreement

Estimated Number of Awards: 1 - One award will be made. It is anticipated that the award will be for a period of five years and the Center will be re-competed thereafter.

Anticipated Funding Amount: $300,000 - The anticipated funding amount is up to $300,000 annually pending availability of funds.

Eligibility Information

Organization Limit:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the Grant Proposal Guide, Chapter I, Section E.

PI Limit:

None Specified

Limit on Number of Proposals per Organization: 1

Limit on Number of Proposals per PI:

None Specified

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):

    August 07, 2013

Proposal Review Information Criteria

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

Award Administration Information

Award Conditions: Additional award conditions apply. Please see the full text of this solicitation for further information.

Reporting Requirements: Additional reporting requirements apply. Please see the full text of this solicitation for further information.

TABLE OF CONTENTS

I. INTRODUCTION

The 21st Century finds science, mathematics, and engineering facing more and more complex ethical and social justice issues. Science and engineering practices are also increasingly multidisciplinary and operate in many organizational, national, and international contexts. This diversity of interests creates a need for connections among the fields, disciplines, organizations, and nations in which these ethical concerns arise.

This project is for the creation of an **Online Resource Center for Ethics Education in Science and Engineering** to support the collection and curating of materials in an online, state of the art resource center, maintaining resources that will help scholars and educators in all of the fields that NSF supports to incorporate ethical and social justice issues and reasoning into their pedagogy, research, and practice.

The portal will contain research findings, pedagogical materials, and promising practices regarding ethics and social justice issues in engineering, social, behavioral, and economic sciences, natural sciences, mathematics and computer sciences, and it will serve as a resource of multimedia materials that may be used by educators to train current and future generations in ethics and social justice issues relevant to these fields. The portal will also assist practitioners in these fields to identify and explore ethical and social justice issues as they arise in their work. It will meet the highest design and technical standards and will be made available to users free of charge.

The Online Resource Center for Ethics Education in Science and Engineering is a response to the America COMPETES Act, published in the Federal Register on August 20, 2009. In FY 2009, NSF published its response to the America COMPETES Act, Section 7009. The NSF requires awards made post January 4, 2010 to have a university approved plan for training graduate students and post-doctoral fellows in ethics. To assist Principal Investigators and academic institutions in meeting this requirement, the NSF committed to fund the development of an Ethics in Science, Mathematics, and Engineering Online Resource Center. By committing the Foundation to this project, the NSF further demonstrates its support for understanding and promoting ethics in science, mathematics, and engineering.

This competition reinforces and builds upon other NSF-funded initiatives. For example, NSF actively supports the creation of knowledge about ethics and social justice in science, mathematics, and engineering by funding original research through the Science, Technology, and Society (STS) Program and original research in ethics education and curriculum development through the Ethics Education in Science and Engineering (EESE) Program. Also, NSF has already funded three beta sites which will provide a foundation for the Online Resource Center for Ethics Education in Science and Engineering.

NSF Award 0936857 (*http://www.umass.edu/sts/digitallibrary/*)

NSF Award 0936865 (*http://www.onlineethics.org/*)

NSF Award 1045412 (*http://nationalethicscenter.org/*)

II. PROGRAM DESCRIPTION

NSF expects to support the development of an online resource center containing research findings, pedagogical materials, and promising practices regarding the ethics and social justice dimensions of research and practice in all of the fields NSF supports. The development and evolution of the center will be informed by the research communities that NSF supports (e.g. engineering, social sciences, natural sciences, mathematics, computer sciences, physical sciences), and it will serve as a living resource of multimedia materials that may be used to train current and future generations of scientists, mathematicians, and engineers in responsible conduct of research (RCR). The center will also assist practicing scientists, mathematicians, and engineers to identify and explore ethical and social justice issues as they arise.

Audiences for the proposed ethics resource center may include but are not limited to:

- instructors who want to incorporate an ethics or social justice module into classes;
- administrators and/or instructors who seek scholarly evaluation of ethics curricula;
- undergraduate and graduate students who seek to understand ethical or social justice issues in science, mathematics, and engineering;
- practicing scientists and engineers who seek to explore ethical reasoning and social justice issues as they arise in their work;
- researchers who create original scholarship on ethics and social justice in science, mathematics, and/or engineering.

A successful proposal will:

- demonstrate the ability to create and maintain a state-of-the-art, dynamic web presence that will enable collection and use of materials;
- show awareness of previous NSF online resource awards and address how the new project will link with existing resources;
- demonstrate awareness of and ability to integrate relevant international resources on ethics in science, mathematics, and engineering;
- address the specific needs of the diverse research communities that NSF supports;
- include a long-term management plan for the sustainability of the online resource center and have a tangible, long-term commitment for its continued existence from a stable organization;
- take into consideration the needs of members of underrepresented groups in one or more of the following ways 1)Americans with Disabilities Act (ADA) compliant 2)resources address the needs of diverse populations and take into consideration gender, race, ethnicity, religion, and culture 3)The personnel involved in this project represent members of underrepresented groups.
- describe the strategy that will be used for vetting new material to be "posted" in the portal and the strategy for protection of copyrighted or proprietary materials.

III. AWARD INFORMATION

One award will be funded under this competition. This award will have a duration of five years and an anticipated total funding amount up to $1,500,000 pending availability of funds.

IV. ELIGIBILITY INFORMATION

Organization Limit:

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the Grant Proposal Guide, Chapter I, Section E.

PI Limit:

None Specified

Limit on Number of Proposals per Organization: 1

Limit on Number of Proposals per PI:

None Specified

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 nsfpubs@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 nsfpubs@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.

The following information supplements the standard GPG or NSF Grants.gov Application Guide proposal preparation instructions:

Personnel Definitions

This program solicitation requests material about the personnel involved in the project. Please use the following definitions to provide the corresponding information*:*

- *Principal Investigators --* Individuals who will assume responsibility for an award resulting from this competition, who will help manage the award, and who are listed on the cover sheet of the proposal.
- *Senior Personnel --* All Principal Investigators, any other named senior personnel who will receive salary support, and any non- salaried senior investigators who will play lead roles in the conduct of the project. This group may include active participants in the research team from outside the U.S.
- *Project Participants --* Every person involved with the research project, including students.

Applications should include the following:

Proposal Cover Sheet- For the program solicitation number, select the number listed at the top of this solicitation. The NSF Unit Consideration will automatically be populated with SES-Ethics Education For Science and Engineering Program. [Grants.gov Users: The program solicitation number will be pre-populated by Grants.gov on the NSF Grant Application Cover Page. Grants.gov users should refer to Section VI.1.2. of the NSF Grants.gov Application Guide for specific instructions on how to designate the NSF Unit of Consideration.] Provide complete information requested on the cover sheet for the principal investigator (PI) and for up to four co-principal investigators (co-PIs), including current contact information.

Project Description- Proposals in this competition are allowed up to 20 pages in the Project Description. The first part (up to 15 pages) should address the core project and the second part (up to 5 pages) is a management plan. The Project Description must contain in a separate section within its narrative, a discussion of the broader impacts of the proposed activities.

In addition to the standard NSF GPG information for the project description, all proposals submitted under this solicitation should also include the following bulleted items:

- *Project Goals-* How will the intended users use the resources? How will the project meet aspirations for excellence in design and accessibility for information seekers?
- *Target Audience-* Describe clearly the communities whose needs will be addressed by the project.
- *Statement-of-Need-* Describe the need for the resources and services of the communities of scholars being addressed. What are the particular user needs of the anticipated participants?
- *Project Design-* Describe the overall approach and the technical components of the project. Topics include:
  - Excellence in design and technical qualities, including aesthetic appeal, and accessible information, with appropriate architecture;
  - Breadth of topical coverage of all scientific fields NSF supports, with appropriate rationale;
  - Criteria and mechanisms for identifying and selecting high quality, relevant digital content;
  - Plan for inclusion of diverse relevant communities, attending to broadening participation in the sciences;
  - Relationship to existing resources, and how this project will use them effectively.
- *Key Staff-* Provide a description of the roles, responsibilities and qualifications of key personnel. These should be tied to major project goals and objectives.
- *Dissemination-* Describe, as appropriate, how knowledge about the online resource will be communicated broadly.

Letters of Collaboration or Letters of Commitment- Brief statements, whether written as letters or as free-standing e-mail messages from individuals and/or organizations that will work with the PIs and/or provide in-kind support for the proposed project, may be included as supplementary documents. Such letters are not needed from individuals included as senior personnel on a project or from subawardee organizations, because their involvement in the project is affirmed by the inclusion of their biographical sketches and/or subaward budgets.

Letters of collaboration or letters of commitment should focus on the willingness of the letter's author to collaborate or provide in-kind support for the project in ways that have been outlined in the project description. Such letters should not argue for support of the project by articulating in greater detail what activities the collaborator will undertake and/or by elaborating reasons for supporting the

project. Such additional text may be included in the project description of the proposal but is not permitted in a supplementary document.

The use of a template like one of the following for letters of collaboration or letters of commitment is recommended. If one of these templates or very similar text is not used, the text provided by the letter's author should be equally brief and to-the-point. Inclusion of longer letters may result in the PIs being forced to remove such letters (with no other changes to the proposal permitted), or NSF may return the proposal without review.

Suggested template for a letter of collaboration:

To: NSF ORCEESE Competition

From: _____ (Printed name of the individual collaborator or name of the organization and name and position of the official submitting this memo)

By signing below (or transmitting this message electronically), I acknowledge that I am listed as a collaborator on the proposal titled "_____(proposal title)_____," with_____ (PI name)_____ as the Principal Investigator. I agree to undertake the tasks associated with me as described in the project description of this proposal.

Signed: _____

Organization: _____

Date: _____

Suggested template for a letter of commitment:

To: NSF ORCEESE Competition

From: _____ (Printed name of the individual collaborator or name of the organization and name and position of the official submitting this memo)

By signing below (or transmitting this message electronically), I acknowledge that I will assist the investigator(s) in the conduct of work outlined in the proposal titled "_____(proposal title) _____," with _____(PI name) _____ as the Principal Investigator. I commit to provide or make available the resources designated in the proposal.

Signed: _____

Organization: _____

Date: _____

IRB Documentation-If the submitting organization's Institutional Review Board (IRB) has approved plans for research involving human subjects or the Institutional Animal Care and Use Committee (IACUC) has approved research involving vertebrate animals, certification of that may be included on appropriate sections of the cover sheet. Documentation of the certification may be included as a supplementary document, but that is not required if sufficient information is provided by the sponsored projects office on the cover sheet of the proposal.

If the IRB and/or IACUC have not approved the research plans when the proposal is submitted, the appropriate box(es) should be checked on the cover sheet and "Pending" should be listed on the line that follows. If IRB or IACUC approval is granted while the proposal is under review at NSF, certification of the approval should be sent to the managing program director. If the IRB or IACUC asks that plans be forwarded to it for approval, have the application ready to go, because notification from the program director that she/he would like to recommend the proposal for an award may come with a very brief time period during which necessary materials (including the IRB or IACUC certification) must be obtained. If the required certifications cannot be supplied quickly, program directors may have to turn their attention to other meritorious projects that can be funded right away.

Most IRB or IACUC approvals are valid for specific time periods. If the expiration of the current approval will occur before or soon after the possible start date for an award, be prepared to seek renewal of the approval so that you have active certification if you are informed the proposal will be recommended for funding. Once you receive written certification that your renewal has been approved, forward it to the managing program officer of your proposal.

Other Supplementary Documents-Permits that demonstrate that permission has been granted to work at a specific study site, to have access to specific collections or other resources, or other forms of documentation may be included as supplementary documents, although as is true with letters of collaboration or letters of commitment, text must be direct and not include additional comments arguing for support of the project, because such additional text belongs in the project description.

Unless authorized here or in the NSF *Grant Proposal Guide*, no other materials should be included in this section. Survey or interview protocols are not permitted in this section, nor are reprints of articles previously published by the investigators. Proposals that include materials in this section that belong in the project description may be returned without review.

Proposals Involving Multiple Organizations

Collaborative proposals are not permitted. In the case of proposals involving multiple organizations, a single organization must be identified as the lead, and a single proposal describing the entire project must be submitted by that organization. Funds may be distributed among partner organizations via subawards from the lead organization. A budget on the standard NSF budget form should be submitted for each subawardee. The requirement for a single organization to submit the sole proposal for a project is designed to facilitate effective coordination among participating organizations and to avoid difficulties that ensue in funded projects when individuals change organizations and/or cease to fulfill project responsibilities.

Proposals Involving Collaborators at Foreign Organizations

Proposers are reminded they must provide biographical sketches of all senior project personnel, including those associated with foreign organizations, and letters of collaboration should be provided as supplementary documents from organizations that will not be supported through subawards.

While non-U.S. institutions are generally not eligible to submit proposals to this competition, the lead U.S. institution may, in limited cases, request funding for non-U.S. institutions through subawards. As described in Chapter V, Section D.1.b of the NSF *Award and*

Administration Guide, indirect costs may not be charged by a non-U.S. organization unless that organization has a previously negotiated rate with a U.S. federal agency.

Subawards

In accordance with the applicable award terms and conditions, proposers are reminded of their responsibilities with regard to subawardees. Should an award be made, the prime awardee is responsible for flowing down the appropriate terms and conditions to, as well as management and oversight of, any subawardees on the project, including any foreign subawardees.

Pre-Submission Checklist

Proposals must be in compliance with the GPG and special requirements in the solicitation in order to be considered for review. Proposals not in compliance with these requirements may not be accepted or may be returned without review. Please refer to the following checklist to address some of the items required in all proposals:

- Font and margin requirements met.
- Page numbers on pages, especially in the Project Description.
- Project summary that is one page and includes three separate sections (an overview, a statement on intellectual merit of the proposed activity, and a statement on the broader impacts of the proposed activity).
- Project description that is 20 pages or less and includes separate sections as specified in the Project Description section above.
- Biographical Sketches (including specification of collaborators and advisors/advisees) for investigators and all senior personnel.
- Confirmation statements from all senior personnel in the Supplementary Documentation section.
- Postdoctoral Researcher Mentoring Plan (if necessary) in the Supplementary Documentation section.
- Data Management Plan submitted in the Supplementary Documentation section.

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

Budget Preparation Instructions:

All subaward budgets with narrative justification should be submitted following the budget and narrative justification from the submitting organization. Submitting organizations should make sure that all subawardees have valid DUNS numbers.

C. Due Dates

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

    August 07, 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://nsf.gov/bfa/dias/policy/merit_review/.

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.

Additional Solicitation Specific Review Criteria

Reviewers for this solicitation are being asked to apply the below two additional review criteria:

- To what extent does the breadth of coverage discussed in the proposal meet the objectives of the program solicitation and the needs of the target audiences?
- To what extent is the management plan appropriate for the creation of a fully functioning resource center?

B. Review and Selection Process

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

In the third year of the award, a reverse site visit will be conducted where the grantee will come to the NSF and present a detailed progress report and a live demonstration of the online resource.

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.

Special Award Conditions: In the third year of the award, a reverse site visit will be conducted where the grantee will come to the NSF and present a detailed progress report and a live demonstration of the online resource center.

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.

Additional Reporting Requirements: Each annual report shall not only report on activities accomplished during the year but also clearly state specific project goals and activities for the upcoming project year. Also, an interim report needs to be submitted thirty days after the award commences to clearly state specific project goals and activities for the first year of the project.

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:

- Linda Layne, SBE/SES, telephone: (703) 292-5026, email: eese-contacts@nsf.gov

- Ephraim P. Glinert, CISE/IIS, telephone: (703) 292-8930, email: eese-contacts@nsf.gov

- Jill L. Karsten, GEO/OAD, telephone: (703) 292-8500, email: eese-contacts@nsf.gov

- Carter Kimsey, BIO/DBI & OISE, telephone: (703) 292-8470, email: eese-contacts@nsf.gov

- Joseph A. Akkara, ENG/EFRI & MPS, telephone: (703) 292-4946, email: eese-contacts@nsf.gov

- Cassandra M. Dudka, OISE, telephone: (703) 292-7250, email: eese-contacts@nsf.gov

- Donna M. Riley, telephone: (703) 292-7107, email: eese-contacts@nsf.gov

- Susan Finger, telephone: (703) 292-4639, email: eese-contacts@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.

Potential applicants should contact the program by using the group's e-mail address eese-contacts@nsf.gov (NSF Ethics Education in Science and Engineering Contacts).

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, "My NSF" is an information-delivery system 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 Grants

Conferences. Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. "My NSF" also is available on NSF's website at http://www.nsf.gov/mynsf/.

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**   (703) 292-5111
  (NSF Information Center)**:**

- **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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