

# EHR Core Research (ECR)

---

## PROGRAM SOLICITATION

NSF 13-555



National Science Foundation

Directorate for Education & Human Resources

### Full Proposal Target Date(s):

July 12, 2013

February 04, 2014

First Tuesday in February, Annually Thereafter

## 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](#).

## SUMMARY OF PROGRAM REQUIREMENTS

---

### General Information

---

#### Program Title:

EHR Core Research (ECR)

#### Synopsis of Program:

The EHR Core Research (ECR) program establishes a mechanism in the Directorate for Education and Human Resources to provide funding in foundational research areas that are broad, essential and enduring. EHR seeks proposals that will help synthesize, build and/or expand research foundations in the following core areas: STEM learning, STEM learning environments, workforce development, and broadening participation in STEM. We invite researchers to identify and conduct research on questions or issues in order to advance the improvement of STEM learning in general, or to address specific challenges of great importance. Two types of proposals are invited: **Core Research Proposals** (maximum 5 years, \$1.5 million) that propose to study a foundational research question/issue designed to inform the transformation of STEM learning and education and **Capacity Building Proposals** (maximum 3 years, \$300,000) intended to support groundwork necessary for advancing research within the four core areas.

#### 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.

- Address questions to the program, telephone: (703) 292-2333, email: [ECR@nsf.gov](mailto:ECR@nsf.gov)

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

- 47.076 --- Education and Human Resources

## Award Information

---

Anticipated Type of Award: Standard Grant or Continuing Grant

**Estimated Number of Awards:** 28

**Anticipated Funding Amount:** \$20,000,000 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:

None Specified

### 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](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](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 Target Date(s):**
  - July 12, 2013
  - February 04, 2014
  - First Tuesday in February, Annually Thereafter

## Proposal Review Information Criteria

---

**Merit Review Criteria:** National Science Board approved criteria apply.

## Award Administration Information

---

**Award Conditions:** Standard NSF award conditions apply.

**Reporting Requirements:** Standard NSF reporting requirements apply.

## TABLE OF CONTENTS

---

### [Summary of Program Requirements](#)

- I. [Introduction](#)
- II. [Program Description](#)
- III. [Award Information](#)

#### IV. Eligibility Information

#### V. Proposal Preparation and Submission Instructions

- A. Proposal Preparation Instructions
- B. Budgetary Information
- C. Due Dates
- D. FastLane/Grants.gov Requirements

#### VI. NSF Proposal Processing and Review Procedures

- A. Merit Review Principles and Criteria
- B. Review and Selection Process

#### VII. Award Administration Information

- A. Notification of the Award
- B. Award Conditions
- C. Reporting Requirements

#### VIII. Agency Contacts

#### IX. Other Information

## I. INTRODUCTION

---

The nation faces extraordinary opportunities and daunting challenges in aspiring to lead the world in science, technology, engineering and mathematics (STEM). Unprecedented diversity in human capital, rapid and exciting scientific advances leading to new approaches to solving critical societal problems, and national emphasis on the importance of innovation all point to unparalleled opportunities for the future.

At the same time, challenges exist in preparing a workforce with adequate competencies and knowledge to advance STEM and understand how it can affect daily life. The National Science Foundation (NSF) is committed to investing in the best ideas in science, engineering and in education across its very broad portfolio. In order to make those investments strategically, and to have confidence in their potential impact, it is essential to build and expand a coherent and deep scientific research base that informs and guides efforts to meet STEM education and learning challenges.

Current approaches to building this research base often are embedded in program solicitations that focus on specific objectives or prescribed activities. By introducing EHR Core Research (ECR), we emphasize the need for accumulating foundational knowledge on STEM learning, growing the portfolio of that knowledge, and underpinning it with more visible and viable theory. NSF plays a critical role in the nation's STEM enterprise through investing in research, development, demonstration and dissemination activities that help to prepare the STEM workforce and educate the public about STEM.

This program seeks to accelerate the development and growth of such activities by laying a coherent foundation of theory and research to guide and improve STEM learning, teaching and the design of learning environments, and to address the challenges of education practice. The notion of "core" funding at NSF is to support research in areas that are broad, essential and enduring. With this program we introduce the availability of "core research funding" in EHR to advance improvements in STEM education and learning.

EHR invites researchers and/or teams of researchers and practitioners to identify and conduct foundational research on questions or issues in order to advance the improvement of STEM learning in general, or to address specific challenges of great importance. Such a foundation is essential for strategically focusing the broader set of investments by the Federal government and other funders on the science of learning and the importance of broadening participation in the STEM workforce and STEM education. Given that EHR is situated within an agency that embodies commitment to the integration of science and education, we are uniquely positioned to provide leadership in these areas of research. Specifically, EHR's mission includes attention to learning across all of the areas of STEM; and with the constant yet changing nature and practice of science, EHR plays a lead role in focusing on heightened interdisciplinary collaboration, use of big data, and international partnerships. Issues of research utilization and scaling of evidence-based ideas also need to be more fully understood in this arena. Projects funded through this program must make clear contributions to synthesizing, expanding, or building the base of research knowledge and evidence needed to achieve excellence in STEM education and workforce development. Additionally, funded projects will contribute to the development of theory and methodology.

Several EHR programs currently support development -- the design and implementation of learning models, materials, or tools that offer windows through which to study learning. Other EHR programs focus on development of the STEM workforce or on broadening participation within it, including development of models and prototypes to be implemented and evaluated. Projects in these programs may provide new and interesting implementation sites that could be the subjects of research funded in ECR (with appropriate collaborations established in advance of submissions).

## II. PROGRAM DESCRIPTION

---

EHR seeks proposals that will help synthesize, build and/or expand research foundations in the following areas: STEM learning, STEM learning environments, STEM workforce development, and broadening participation in STEM. The intention is to identify a broad range of vital investments for STEM education and learning research. Much existing research addresses issues that span more than one area, and we encourage integration, as well as collaboration among researchers in related disciplines, including the social and behavioral sciences. Learners appropriate for study range from pre-K children to older adults and from non-scientists to STEM doctoral students to members of the STEM workforce. Relevant learning environments range from formal to informal settings, virtual settings, and outdoor/field to institutional R&D settings. EHR seeks theory-driven, theory-generating, theory-testing, and predictive studies of all aspects of STEM learning.

**STEM Learning:** We encourage projects that focus on such areas as: the learning of specific STEM subject matter content and practices; learning progressions, assessments and instruction-assisted development to support STEM learning; STEM learning and engagement outside of formal schooling; and dissemination of knowledge and learning within social networks. We are interested in

such issues as integrating research knowledge from different theoretical or methodological perspectives; the role of such constructs as persistence and identity; the development of quantitative, computational, and model-based reasoning in K-16 STEM learning; cognitive, social and behavioral competencies; and conceptual understanding of key STEM ideas. Additionally, we have interest in research that focuses on particular groups of learners and on learning in various contexts. Studies that draw on large and growing databases (e.g., "big data") are encouraged, as are studies that examine learning in networked and cyber-enabled settings. Research on learning at the frontiers of STEM disciplines and interdisciplinarity are critical if we are to develop the innovative workforce necessary for tomorrow.

**STEM Learning Environments:** New kinds of learning environments are emerging and more traditional learning environments are evolving as the roles of teacher and learner change, expert and novice shift, and producer and consumer of knowledge becoming intermingled. STEM Learning Environments might range from a university STEM department or program; to a model curriculum, museum exhibit or summer internship program; to science and engineering laboratories; to a STEM teacher preparation program; or to teaching/learning in classroom or informal settings. Many such environments have been developed and tested with funding from EHR awards in the past. Learners navigate multiple disciplines and environments and follow learning paths individually or collectively. Such pathways can be structured or unstructured, in formal or informal settings, at home or in the workplace, and short-term or of extended duration. What is critical is to understand how characteristics of these environments interact with and support or hinder multiple aspects of STEM learning. Of particular interest are proposals that examine changing and emerging environments such as online/media learning at scale, blended instruction, virtual reality, personalized learning environments, and evidence-based approaches to undergraduate STEM teaching. These proposed studies may adopt a variety of theoretical perspectives and employ a range of methodologies that include, for example, design-based implementation research (which may include development) or complex systems analysis.

**STEM Workforce Development:** NSF invests heavily in efforts to prepare a diverse, highly skilled STEM workforce, including STEM teachers, that can lead and innovate in a complex global economy. Key influences relative to workforce development occur as early as middle school, and may continue through technical training in community colleges or career preparation in undergraduate or graduate programs and then into lifelong, personalized learning as the competencies and knowledge needed for STEM careers shift. EHR seeks proposals to strengthen the research base that informs investments in STEM workforce preparation and development at all levels. Evidence-based understanding of STEM learning is necessary with respect to STEM career pathways and transitions; academic and non-academic STEM careers; emerging practices and changing contexts of STEM workforces; and the changing higher education climate and capacity for reforming STEM workforce development efforts. We are interested in building understanding of how different funding models at the undergraduate and graduate levels (e.g., teaching assistantship, fellowship, traineeship, research assistantship, work-for-pay, loans) might best equip 21st century STEM workers with advanced and flexible skills so that they are ready to operate in the labs and at the frontiers of science. It is critical to better understand what leads to retention and degree attainment for undergraduates in STEM majors and to work with public/private partners and stakeholders toward understanding the preparation students need for successful transition to the workplace or graduate school. Mapping backward from workplace expectations for knowledge and competencies to the design of interventions might yield more effective interventions. We encourage proposers to leverage current NSF investments (e.g., interdisciplinary research centers, large facilities, funded workforce development projects) as research sites.

**Broadening Participation in STEM:** U.S. leadership in the global STEM enterprise requires including every sector of the population in order to build a diverse STEM workforce capable of innovation and to educate a general populace able to benefit from and engage with STEM. This requires commitment to increased participation from groups, institutions, and geographic regions that currently are underrepresented in STEM research and education programs. Specifically, the opportunities for women, Hispanics, African Americans, Native Americans, Pacific Islanders, and persons with disabilities to participate and succeed in STEM must be improved dramatically. We seek proposals that will pursue fundamental research questions about what it takes to broaden participation in STEM effectively, including better understanding how to build institutional capacity and informal learning environments that foster the untapped potential of underrepresented minority groups in STEM fields. Here, too, we need to better understand what leads to retention and degree attainment and to what works with public/private partners and stakeholders toward understanding the preparation students need for successful transition to the workplace or graduate school. Current technologies and cyberlearning options have provided new opportunities to further enhance STEM research and education; however, issues of accessibility for and impacts on underrepresented groups are not yet fully understood. The development of measures, processes and metrics to assess impacts and outcomes of broadening participation and institutional capacity initiatives and programs is also needed. Several specific areas of research are welcomed, including studies that examine the impact of diversity (or the lack thereof) of various kinds on innovation and productivity in STEM education and in the STEM workforce. In-depth studies on what practices have worked across multiple sites would be valuable.

PIs who have questions about whether their project idea should be submitted to ECR or to another EHR program should consult with one of the ECR Program Officers. In some cases co-funding with existing programs will be appropriate.

### III. AWARD INFORMATION

---

**Anticipated Type of Award:** Continuing Grant or Standard Grant

**Estimated Number of Awards:** 28

**Anticipated Funding Amount:** \$20,000,000 pending availability of funds.

**Research proposals** - \$1,500,000 total; over a period of 5 years.

**Capacity building proposals** - \$300,000 total; over a period of 3 years.

### 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:**

None Specified

**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 Announcement via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program announcement 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](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](mailto:nsfpubs@nsf.gov). Proposers are reminded to identify this program announcement number in the program announcement 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 announcement 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](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 announcement 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](mailto:nsfpubs@nsf.gov).

In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. Chapter II, Section D.4 of the Grant Proposal Guide provides additional information on collaborative proposals.

**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.**

### B. Budgetary Information

---

**Cost Sharing:** Inclusion of voluntary committed cost sharing is prohibited

### C. Due Dates

---

- **Full Proposal Target Date(s):**

July 12, 2013

February 04, 2014

First Tuesday in February, Annually Thereafter

### 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](mailto: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](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](mailto: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](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](mailto: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](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](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:

- Address questions to the program, telephone: (703) 292-2333, email: [ECR@nsf.gov](mailto:ECR@nsf.gov)

For questions related to the use of FastLane, contact:

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



The National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230, USA  
Tel: (703) 292-5111, FIRS: (800) 877-8339 | TDD: (800) 281-8749

Last Updated:  
11/07/06  
[Text Only](#)