Research and Evaluation on Education in Science and Engineering (REESE)

PROGRAM SOLICITATION
NSF 12-552

REPLACES DOCUMENT(S):
NSF 10-586, NSF 11-526

National Science Foundation

Directorate for Education & Human Resources
Research on Learning in Formal and Informal Settings

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

July 17, 2012

IMPORTANT INFORMATION AND REVISION NOTES

The REESE solicitation has merged with the Fostering Interdisciplinary Research on Education (FIRE) solicitation. FIRE will no longer have a separate solicitation. FIRE proposals should now be submitted to the REESE competition.

The REESE solicitation has a strand called Broadening Participation Research that converges with elements of the Research on Gender in Science and Engineering (GSE) and Research on Disabilities Education (RDE) solicitations that concern research on broadening participation in STEM education. The new BPR strand is jointly managed by DRL and HRD with coordination by the RDE, GSE, and REESE programs.

The REESE solicitation no longer includes a strand specifically focused on national STEM policies, but policy-relevant research is welcome across all strands. The REESE strand on Research on Implementation has been renamed Research on Diffusion to reflect a broader perspective on eligible topics. REESE no longer accepts Pathways proposals. Instead, there are three sizes of Empirical awards that may be submitted: Small, Medium, and Large.

The first sentence of the Project Summary should indicate the project type (i.e., Synthesis, Empirical, or FIRE).

In Part V, under Proposal Preparation Instructions, the solicitation provides additional detail on expectations for research design and methodology for all proposals to REESE.

Important Reminders

A revised version of the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG), NSF 11-1, was issued on October 1, 2010 and is effective for proposals submitted, or due, on or after January 18, 2011. Please be advised that the guidelines contained in NSF 11-1 apply to proposals submitted in response to this funding opportunity. Proposers who opt to submit prior to January 18, 2011, must also follow the guidelines contained in NSF 11-1.

Cost Sharing: The PAPPG has been revised to implement the National Science Board's recommendations regarding cost sharing. Inclusion of voluntary committed cost sharing is prohibited. In order to assess the scope of the project, all organizational resources necessary for the project must be described in the Facilities, Equipment and Other Resources section of the proposal. The description should be narrative in nature and must not include any quantifiable financial information. Mandatory cost sharing will only be required when explicitly authorized by the NSF Director. See the PAPP Guide Part I: *Grant Proposal Guide (GPG)* Chapter II.C.2.g(xi) for further information about the implementation of these recommendations.

Data Management Plan: The PAPPG contains a clarification of NSF's long standing data policy. All proposals must describe plans for data management and sharing of the products of research, or assert the absence of the need for such plans. FastLane will not permit submission of a proposal that is missing a Data Management Plan. The Data Management Plan will be reviewed as part of the intellectual merit or broader impacts of the proposal, or both, as appropriate. Links to data management requirements and plans relevant to specific Directorates, Offices, Divisions, Programs, or other NSF units are available on the NSF website at: http://www.nsf.govbfa/dias/policy/dmp.jsp. See Chapter II.C.2.j of the GPG for further information about the implementation of this requirement.

Postdoctoral Researcher Mentoring Plan: As a reminder, each proposal that requests funding to support postdoctoral researchers must include, as a supplementary document, a description of the mentoring activities that will be provided for such individuals. Please be advised that if required, FastLane will not permit submission of a proposal that is missing a Postdoctoral Researcher Mentoring Plan. See Chapter II.C.2.j of the GPG for further information about the implementation of this requirement.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Research and Evaluation on Education in Science and Engineering (REESE)

Synopsis of Program:

The Research and Evaluation on Education in Science and Engineering (REESE) program seeks to advance research at the frontiers of STEM learning and education, and to provide the foundational knowledge necessary to improve STEM learning and education in current and emerging learning contexts, both formal and informal, from childhood through adulthood, for all groups, and from before school through to graduate school and beyond into the workforce. The goals of the REESE program are: (1) to catalyze discovery and innovation at the frontiers of STEM learning and education; (2) to stimulate the field to produce high quality and robust research results through the progress of theory, method, and human resources; and (3) to coordinate and transform advances in education and learning research. In coordination with the Research on Gender in Science and Engineering (GSE) and Research on Disabilities Education (RDE) programs, REESE supports research on broadening participation in STEM education. REESE pursues its mission by developing an interdisciplinary research portfolio focusing on core scientific questions about STEM learning; it welcomes Fostering Interdisciplinary Research on Education (FIRE) projects, previously called for in a separate solicitation. REESE places particular importance upon the involvement of young investigators in the projects, at doctoral, postdoctoral, and early career stages, as well as the involvement of STEM disciplinary experts. Research questions related to educational research methodology and measurement are also central to REESE activities.

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 REESE program officers, telephone: (703)292-8650, email: DRLREESE@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: 20 to 30

Between 20-30 new awards in FY 2012. Approximately 2-3 Synthesis, 7-10 Small Empirical, and 7-10 Medium Empirical, 1-2 Large Empirical, and 3-5 FIRE awards will be funded.

Anticipated Funding Amount: $10,000,000

$10,000,000 for new awards. The maximum award amount for Synthesis projects is $300,000, with duration of up to two years. The maximum award amount for Small Empirical research projects is $500,000, with duration of up to three years. The maximum award amount for Medium Empirical research projects is $1,500,000, with duration of up to three years. The maximum award amount for Large Empirical research projects is $2,500,000, with duration of up to five years. The maximum award amount for FIRE projects is $400,000, with duration of two years.

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.

- 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):

    July 17, 2012

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: Standard NSF award conditions apply.

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

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I. INTRODUCTION

About the National Science Foundation and the Directorate for Education and Human Resources

The National Science Foundation (NSF) is charged with promoting the vitality of the nation's science, technology, engineering and mathematics (STEM) research and education enterprises. As part of this mission, the Directorate for Education and Human Resources (EHR) has primary responsibility for providing national and research-based leadership in STEM education.

The mission of EHR is to achieve excellence in U.S. STEM education at all levels and in all settings (both formal and informal) to support the development of a diverse and well-prepared workforce of scientists, technicians, engineers, mathematicians and educators and a well-informed citizenry that has access to the ideas and tools of science and engineering. Specific EHR goals are

to:

1. Prepare the next generation of STEM professionals and attract and retain more Americans to STEM careers.
2. Develop a robust research community that can conduct rigorous research and evaluation that will support excellence in STEM education and that integrates research and education.
3. Increase the technological, scientific and quantitative literacy of all Americans so that they can exercise responsible citizenship and live productive lives in an increasingly technological society.
4. Broaden participation (individuals, geographic regions, types of institutions, STEM disciplines) and close achievement gaps in all STEM fields.

EHR sponsors programs in the Divisions of Research on Learning in Formal and Informal Settings (DRL), Undergraduate Education (DUE), Graduate Education (DGE), and Human Resource Development (HRD). The REESE program is managed in DRL.

About the Division of Research on Learning in Formal and Informal Settings

DRL invests in projects to enhance STEM learning for people of all ages in both formal and informal learning settings. Its mission includes promoting innovative and transformative research and development, and evaluation of learning and teaching in all STEM disciplines. New and emerging areas of STEM must play prominent roles in efforts to improve STEM education. The integration of cutting-edge STEM content and the engagement of STEM researchers are encouraged in all DRL initiatives. DRL's role is to be a catalyst for change by advancing theory, method, measurement, development, evaluation, and application in STEM education. The Division seeks to support both development of promising new ideas and large-scale implementation of proven educational innovations. The Division's programs offer a set of complementary approaches for advancing research, development, and field-based improvements.

- The Research and Evaluation on Education in Science and Engineering (REESE) program advances research at the frontiers of STEM learning and education, and provides foundational knowledge to improve STEM teaching and learning at all ages and in all settings.
- The Discovery Research K-12 (DR K-12) program enables significant advances in preK-12 student and teacher learning of the STEM disciplines through development and study of innovative resources, models, and technologies for use by students, teachers, administrators, and policy-makers.
- The Informal Science Education (ISE) program supports innovation in anywhere, anytime, lifelong learning, through investments in research, development, infrastructure, and capacity-building for STEM learning outside formal school settings.
- The Innovative Technology Experiences for Students and Teachers (ITEST) program invests in projects designed to address the growing demand for professional and information technology workers through the design, implementation, scale-up, and testing of technology-intensive educational experiences for students and teachers, and through related research studies.

Each of these programs is intended to improve their field's capacity for STEM teaching and learning. They are central to NSF's strategic goals of Learning and Discovery, helping to cultivate a world-class and broadly inclusive STEM workforce, expanding the scientific literacy of all citizens, and promoting research that advances the frontiers of knowledge. The REESE program solicitation focuses on research on learning across all ages and settings. Other DRL solicitations may have overlap with REESE on particular settings or ages. Potential investigators are encouraged to study all DRL solicitations for their applicability to the proposed topic of study.

DRL and Innovation

All research and development activities within DRL aim at generating knowledge and transforming practice in STEM education. DRL's programs are designed to complement each other within a cycle of research and development that forms the conceptual framework for its programs (adapted from RAND, 2003; American Statistical Association, 2007; NSF, 2005). All DRL programs are concerned with all five components of the cycle (see Figure 1) to varying degrees. Work in each part of the cycle forms a foundation for transition to the next part of the cycle.
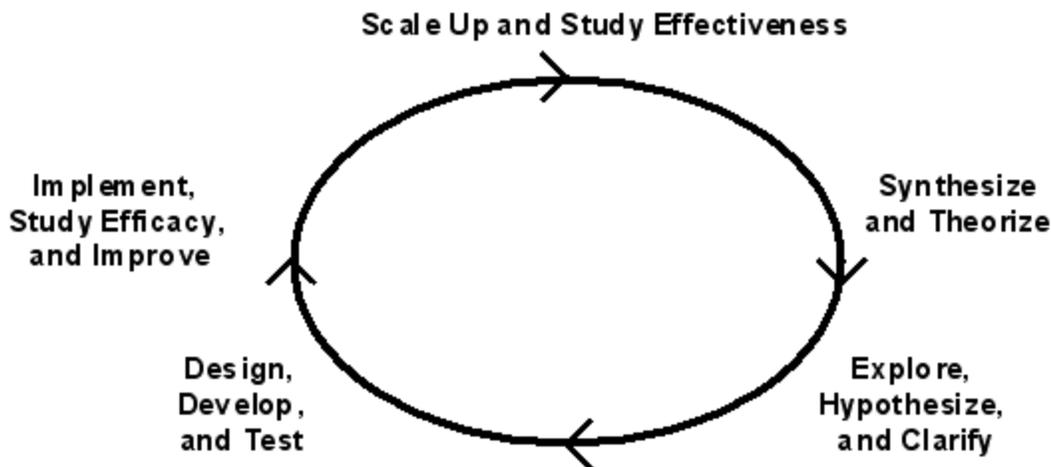

Figure 1: Cycle of Research and Development

Projects funded by DRL are providing the ideas, resources, and human capacity to advance STEM education and learning in the 21st Century:

- Challenging the STEM education and research communities with transformative ideas;
- Conducting the pioneering and pragmatic research necessary to advance STEM learning;
- Developing and studying world-class learning resources for teachers, students, and the public; and
- Addressing workforce needs through the design and study of technology-intensive educational experiences.

The major distinction between the REESE and DR K-12 programs is that REESE projects focus primarily on building theory and knowledge about STEM learning and education across all contexts and ages and for all groups, whereas DR K-12 projects focus on development and study of specific resources, models, and technologies designed to improve STEM education in PreK-12 schools. The primary outcomes of REESE projects will be research findings, methods, and theoretical perspectives about STEM education. Though the principle audiences for the output of REESE projects will be other communities of researchers, the logical implications of REESE projects for educational practice should be clear, if long term. The REESE program has an interdisciplinary portfolio that connects research on education and learning with literatures and communities represented by the other NSF directorates. The outcomes of DR K-12 projects will be STEM education innovations and design principles that are informed by research and tested in practice. Similarly, note that informal STEM education research projects that place greater emphasis on practice should be submitted to the Informal Science Education (ISE) Program. Proposers who are in doubt about the appropriate program for funding of their work should consult an NSF Program Officer with these programs. One possible visualization for this relationship is shown in Figure 2.

Figure 2: Sample representation of relationship between REESE and DR K-12

II. PROGRAM DESCRIPTION

The REESE program unifies the Research and Evaluation on Education in Science and Engineering (REESE) and Fostering Interdisciplinary Research on Education (FIRE) solicitations.

The goals of the REESE program are: (1) to catalyze discovery and innovation at the frontiers of STEM learning and education; (2) to stimulate the field to produce high quality and robust research results through the progress of theory, method, analysis, and human resources; and (3) to coordinate and transform advances in research on learning and education. REESE supports research that seeks transformative and novel answers to foundational questions about what STEM concepts can be learned by whom, when, how, and where. The initial benefits of REESE proposals are primarily up-stream. They ought to have the potential to advance the relevant research literatures. REESE pursues its mission by developing a research portfolio focusing on core scientific questions of STEM learning and education. REESE-supported research is often multi- and inter-disciplinary, drawing on the expertise of STEM content experts, STEM education researchers and evaluators, cognitive and social scientists, and experts from other areas of practice and scholarship. REESE projects may focus on any age range and any setting, including schools, homes, museums, and science centers.

REESE projects should employ research designs and methodologies that are appropriate to the goals of the research. Proposals should have a strong connection to a STEM content area and should indicate who the direct audiences are for the results (e.g., other communities of researchers, materials developers, teacher-educators, policy analysts, or policymakers) and whom the eventual beneficiaries of the research are, however indirectly and long-term.

A. Research Strands

REESE challenges scholarly communities to put forward groundbreaking ideas, concepts, theories, and measurement and methodological approaches that focus on one or more of the following topical strands. These strands do not constitute an exhaustive or mutually exclusive set of priorities or possibilities.

1. Neural bases of STEM learning

In order to gain traction on fundamental questions of mind and brain as related to STEM learning, REESE supports innovative combinations of theory, empirical techniques, and levels of analysis from a wide range of disciplines. An important goal of these activities is to identify paths by which multidisciplinary research anchored in the neural bases of human learning has the potential to inform practice. REESE encourages projects that have implications - even if indirect and in the long-term - for such topics as: (1) how one might begin to derive principles for the design of STEM instructional materials and practices based on what is known about potential for neural plasticity and development; (2) what implications aging has for STEM learning and problem-solving (at any age); and (3) what implications neurocognitive research has for educational measurement and the assessment of individual differences and for claims about the range of intellectual abilities that might be involved in STEM expertise.

2. Cognitive underpinnings of STEM learning

REESE encourages proposals about the cognitive processes underlying the learning and teaching of STEM content. This research should produce knowledge about the nature of STEM learning, teaching, and thinking that has important implications for research and development efforts, as assumptions about cognitive processes are at least implicit in a range of STEM instructional materials (e.g., curricula, standards, and museum exhibit design), teaching practices, and assessments in both formal and informal contexts.

REESE invites proposals that address a range of cognitive questions central to STEM learning such as: (1) how the initial, transitional, and target knowledge states of the learners ought best to be characterized; (2) what the developmental courses of such learning are and how they can be enhanced; (3) what the component concepts are that learners must know in order to understand

more complex STEM concepts; (4) how understanding of such concepts can be measured; (5) why some concepts are easy to learn or intuitive while others are difficult to learn and prone to alternate interpretation or misconception, (6) what individual or group differences have valid implications for STEM learning (e.g., culturally-relevant curricula or assessment); and (7) how multi-media and representations of knowledge can affect a diverse set of learners. REESE encourages proposals that focus on executive functioning, reasoning, conceptual representation, attention, memory, problem-solving, language, categorization, and statistical learning in these and related STEM learning topics.

3. STEM learning in formal and informal settings

REESE seeks to expand and improve upon novel, fundamental, and transformative research and theory about how people learn in and across STEM disciplines and in applied learning contexts with the intent that these contributions will serve as the knowledge precursors necessary for the development and enactment of future educational improvements. Such research may address characteristics of students, instructors, administrators, parents, students, policymakers, or others.

REESE welcomes proposals that explore: (1) the interrelationships among teaching, learning, and assessment such as learning progressions that create new models for STEM learning across grade levels; (2) affective dimensions of learning, such as what motivates and sustains learner interest in STEM and what fosters engagement and persistence; (3) informal contexts and contexts that blur the boundary between formal and informal, such as early-childhood learning and parent-child interactions, home schooling, out-of-school programs, programs that broaden participation and diversity, programs for at-risk students, technical training programs, alternative organizational designs for education and learning, and emergent virtual learning structures and environments; (4) learning contexts such as small and large group environments, socio-economics, culture, language, politics, and geography; and (5) the effectiveness of different instructional strategies in particular organizational and social situations (e.g., peer tutoring, inquiry-based classrooms, laboratories, and cooperative partnerships). REESE encourages research proposals that explore these areas in concert and at multiple organizational or systems levels. While REESE does not contain a strand focused on policy, policy-relevant research is encouraged across all strands. In particular, REESE welcomes research across all strands on the implications for curriculum, professional development, and assessment of the adoption of Common Core Mathematics Standards (*cf*. Common Core State Standards Initiative, n.d.) and the release of the Framework for Science Education (NRC, 2011).

4. Learning technologies

REESE encourages proposals that explore fundamental questions in the use of learning technologies to promote innovative and improved ways of learning STEM content or allow for the learning of STEM content that would not otherwise be possible without such technologies. For the purposes of this strand, learning technologies are the array of computer-based tools and systems are that designed to improve learning and other outcomes of interest (e.g., visualization and simulation technologies, games, cognitive tutors, mobile technological devices).

REESE welcomes proposals about educational technology that focus on topics such as: (1) the types of STEM content that are most effectively learned in such environments, whether individually or collaboratively; (2) how best to represent and make accessible STEM content to increase learners' knowledge or reasoning; (3) how best to support teaching using learning technologies; (4) how to determine the validity of technology-enhanced approaches to learning and instruction; and (5) how to use educational technology to enhance interest in and positive attitudes toward STEM topics and careers.

5. Research on Diffusion

REESE encourages research in pursuit of knowledge and theory around the diffusion and use of innovation and research-based knowledge in STEM education and learning. Such research should be designed to explain, model, enhance, and predict the processes by which a STEM education innovation is adopted and implemented, successfully or unsuccessfully, in STEM education contexts. REESE invites researchers to investigate: (1) the nature of diffusion and implementation--partial versus full, pseudo versus genuine adoption, fidelity of versus adaptation and adaptability, top-down versus bottom-up, cyber or technology-enabled versus face-to-face, institutionalization versus evolution, concurrent or successive implementations, and simple use versus use and transformation; (2) the processes and environments for diffusion and implementation--the organization or system, audiences, partnerships, social networks, intermediaries, individual and group behaviors, and additional translational research, and (3) the nature of the innovation or reform--its complexity, its embodiment as physical artifact or knowledge endowment, knowledge prerequisites for its use, usability, and instrumental or indirect usefulness.

6. Methods, models, and measures for STEM education and learning research

REESE is committed to advancing the state of the art in STEM education research by supporting projects to improve or develop new qualitative and quantitative methods, analytic tools, models, and measures related to STEM education and learning. This may include the development of novel methods, the expansion or refinement of existing methods and measures, or the transfer and application of methods and models from other disciplines (e.g., anthropology, computer science, sociology, economics, and epidemiology).

REESE supports: (1) development and application of innovative methods and analytic techniques including novel approaches to explanation, prediction, and causality; the integration and reduction of data; new means of data collection and analysis; multi-source and multi-method verification (e.g., triangulation); narrative and text analysis; and ways of dealing with multiple levels of data and units of analysis; (2) the development, testing, refinement, and application of qualitative, statistical, and conceptual models, and machine learning or agent-based models; and (3) the theoretical and empirical development and psychometric testing of measures and instruments as applied to STEM education and learning research, such as the assessment of cognitive (e.g., knowledge, ability, performance), behavioral, and affective (e.g., attitude, engagement) outcomes at the individual, program, organization, or systems levels.

7. Secondary analysis of large datasets

REESE encourages studies that conduct secondary analysis of existing datasets from state, national, or international studies. The purpose of this strand is to leverage these existing databases to inform research, policy, or practice in STEM education and learning in the near or long term. In some cases, studies may need to bridge multiple, large-scale datasets or collect additional data as necessary. The proposal must specify how the databases to be studied are representative of state, national, or international levels. Statistical models to be tested should be included, as appropriate.

Some example datasets are the Survey of Earned Doctorates; the National Assessment of Education Progress (NAEP; NCES, 2011); Trends in International Math and Science Study (TIMSS; NCES, 2008); and the Programme for International Student Assessment (PISA). REESE also encourages qualitative or mixed-method analyses of existing repositories of video, audio, text, and/or instructional artifacts (e.g., Child Language Data Exchange System [CHILDES], n.d.; *cf*. Hawkey, Thompson, & Turner, 2007). The above examples are demonstrative; REESE welcomes proposals for secondary analyses of any data source that has state, national, or international implications.

8. Broadening participation research

REESE encourages projects that seek to enhance our understanding of issues underlying the differential learning and participation of members of groups underrepresented in STEM fields. Underrepresented groups may include (but are not necessarily limited to) women and girls, people with disabilities, underrepresented minorities (e.g., African Americans, Hispanics, Native Americans, Native Alaskans, Native Hawaiians, and Pacific Islanders), and students from rural, lower socio-economic. Proposers must document the STEM disciplinary underrepresentation of the groups they wish to study and place the proposed work in the broader context of STEM education and workforce participation in the U.S. This effort in REESE complements similar efforts in the Research on Disabilities Education (RDE) and Research on Gender in Science and Engineering (GSE) programs.

The more long-term goal of the strand is to catalyze the acquisition of knowledge that informs the development of interventions that could have an impact on learning, persistence, and success in STEM for members of various groups under specific conditions and in specific contexts. Proposed research may investigate behavioral, cognitive, affective, and social factors as well as organizational, institutional, or systemic processes that may have an impact on participation and learning in STEM fields. Proposals that explore the various influences of an individual's identity in multiple groups are especially invited (e.g., race and disability status). Proposers must document the STEM disciplinary underrepresentation of the groups they wish to study and place the proposed work in the broader context of STEM education and workforce participation in the US.

B. Eligible proposal types

The REESE program calls for three types of proposals: Synthesis, Empirical Research, and FIRE. More information on each proposal type is specified below. The proposal type (Synthesis, Empirical Research, or FIRE) should be specified in the first sentence of the Project Summary.

1. Synthesis proposals

Synthesis projects are small grants for the synthesis and/or meta-analysis of existing knowledge on a topic of critical importance to STEM learning and/or education, or for the diffusion of research-based knowledge. Synthesis proposals should identify areas where the knowledge base is sufficiently robust to support strong scientific claims, identify areas of importance to education research or practice, and propose rigorous methods for synthesizing findings and drawing conclusions from a range of relevant literatures. Proposals should identify the criteria to be used for including or excluding studies in the synthesis. Investigators are permitted to propose workshops and other meetings as one of the means of completing the syntheses and diffusing the research-based knowledge that is developed. Additional emphasis will be placed on the proposed dissemination plan. Maximum award size for Synthesis proposals is $300,000 (total) for duration of up to two years.

2. Empirical Research proposals

Empirical Research projects are designed to support the design and conduct of research projects including the collection of new empirical data or the use of secondary analyses from existing state, national, international or other databases. Three levels of Empirical Research are available: Small, Medium, and Large.

- **Small Empirical** projects will have maximum total award size of $500,000 and duration of 3 years.
- **Medium Empirical** projects will have maximum total award size of $1,500,000 and duration of 3 years.
- **Large Empirical** projects will have maximum total award size of $2,500,000 and duration of 5 years.

In all cases, the proposal must carefully justify why a budget of the respective size would be appropriate to carry out the research. Any proposal may involve teams of multi-disciplinary experts working on conceptually related problems.

3. Fostering Interdisciplinary Research in Education (FIRE) proposals

The program supports FIRE projects that facilitate scholars crossing disciplinary boundaries to acquire the skills and knowledge that would improve their abilities to conduct rigorous research on STEM learning and education. Proposals must have both a research and a professional development component. The primary goal of FIRE is to facilitate the development of innovative theoretical, methodological, and analytic approaches to understanding complex STEM education issues of national importance and, by so doing, make progress toward solving them. A secondary goal of FIRE is to broaden and deepen the pool of investigators engaged in STEM educational research, by bringing their communities into closer and more systematic interaction with another. To address this goal, investigators must pair with a mentoring scholar in the to-be-learned field.

Each proposal must include one individual who will serve as the mentor and one individual who will be mentored. There is no restriction about whether the mentor is designated as the PI and the mentee as the co-PI, or vice versa, except as allowed by the submitting organization. Other personnel and co-PIs are allowed. Investigators may receive an award at any point in their post-graduate careers, whether at a more junior or senior level. Awards are open to investigators who have received a doctoral degree in a disciplinary STEM field outside of education proper and wish to pursue research in learning and education, or who have received a doctoral degree from an educational research program and wish to complement their expertise with training in a disciplinary STEM field outside of education. For the purposes of this solicitation, FIRE defines non-education STEM fields as those communities largely represented by a program at NSF in the directorates of Biological Sciences (BIO), Computer and Information Sciences and Engineering (CISE), Engineering (ENG), Geosciences (GEO), Mathematics and Physical Sciences (MPS), or Social, Behavioral and Economic Sciences (SBE), or the Office of Polar Programs (OPP).

In a manner appropriate for all REESE proposals, FIRE proposals should describe the research project to be undertaken. In addition, investigators should describe what their professional development goals are and what activities they will engage in to achieve those goals (e.g., courses or seminars participated in, lab groups joined). The proposal should make clear the collaborative activities among the investigators, how these activities will develop capacity in STEM educational research, and why an interdisciplinary collaboration will make progress on the educational issue addressed. The maximum award size for FIRE projects is $400,000, with duration of 2 years.

C. Conferences and Workshops

REESE may support a few well-focused conferences or workshops related to the goals of the program. Budgets are expected to be commensurate with the duration of the event and the number of participants. Typical costs are $25,000 to $75,000. Proposals should include a conceptual framework for the conference, draft agenda, possible participant list, and the outcomes or products that will result. Conference and workshop proposals are evaluated on an ad hoc basis and so may be submitted at any time (not only to the competition deadline), generally at least one year in advance of when the event would be held. Investigators are encouraged to contact a Program Officer prior to submission. Please see the NSF Grant Proposal Guide (GPG Section II. D.) for additional information about conference and workshop proposals.

D. References

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III. AWARD INFORMATION

NSF expects to make standard or continuing grant awards. The estimated number of awards will be 20-30 new awards in FY 2012. Approximately 2-3 Synthesis, 7-10 Small Empirical, and 7-10 Medium Empirical, 1-2 Large Empirical, and 3-5 FIRE awards will be funded. The anticipated funding available for new awards in FY 2012 for REESE is $10,000,000. The maximum award amount for Synthesis projects is $300,000, with duration of up to two years. The maximum award amount for Small Empirical research projects is $500,000, with duration of up to three years. The maximum award amount for Medium Empirical research projects is $1,500,000, with duration of up to three years. The maximum award amount for Large Empirical research projects is $2,500,000, with duration of up to five years. The maximum award amount for FIRE projects is $400,000, with duration of two 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 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.

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.

The REESE program has five additional preparation requirements that each proposal must address: (1) letters of agreement to participate, (2) research design and methodology, (3) project personnel and management, (4) dissemination, and (5) project evaluation.

Letters of agreement to participate: As appropriate, there are two types of letters that may be included in the Supplementary Documents section of the proposal. First, proposals are expected to include letters of agreement to participate from all appropriate organizations that provide the context for data collection or play a substantial role in ensuring access to required resources. Second, proposals are expected to contain letters of agreement to participate from members of advisory committees and external evaluators. The inclusion of general letters of support is not allowed and may result in a proposal's being *returned without review*.

Research design and methodology: REESE expects investigators to propose appropriate and rigorous research methods, whether quantitative, qualitative, or mixed-method. Investigators are expected to conduct their research so that relevant models, frameworks, data, literature, and measures are well-documented, usable, and replicable by other research teams wishing to work on similar problems from other vantage points or by using other research designs. The proposed methods should be well-justified, consonant with theory, and suited to the stated research questions or hypotheses. Each supported project must meet the following basic requirements:

- The proposed topics, questions, methodologies, and research settings must be consistent with the overall goals of the REESE program. Investigators should pose research problems of a transformative nature or of compelling national importance, while being deeply rooted in one or more STEM fields. Research questions must be clear and specific and must be answerable through the means proposed.
- Investigators must demonstrate how the proposed research builds upon existing evidence obtained from relevant prior research. All proposals must draw on existing educational and learning literatures and on the education-related literature in one or more other domains such as: physical, biological and geosciences; engineering; social and behavioral sciences; cognitive science; neuroscience; learning sciences; information science; or statistics and mathematics. These examples are not intended to be exhaustive.
- REESE encourages and supports research using a range of research designs. The design and methods must be appropriately matched to the nature of the research problem and the proposed questions or hypotheses. The investigators must explicitly describe the research design, including both the data collection and the data analysis plans.
  - For quantitative proposals and aspects thereof, the description of methodology may include: the study sample and selection process, instruments and other means of data collection, power analyses, and minimal detectable effect sizes, and the models to be tested (to the extent this can be hypothesized in advance). Information must also be provided on the reliability, validity, and appropriateness of proposed measures and instruments. If the reliability and validity of the instruments are initially unknown, the proposal must describe specific plans for establishing these measurement properties. This list is not exhaustive. It is only intended to demonstrate the level of detail expected by proposals.
  - For qualitative proposals and aspects thereof, the description of methodology may include: the rationale for the populations and cases to be studied; detail on the sources of data, such as observations or artifacts, efforts to triangulate findings; reliability and validity of instruments and protocols; procedures to code and interpret the data; and plans for ensuring authenticity and validity of findings. This list not exhaustive; it is only intended to demonstrate the level of detail expected by proposals.
  - For mixed-methods studies, both the qualitative and quantitative methods should be clear and follow the suggestions above. Furthermore, the proposal should describe the ways that the qualitative and quantitative portions interconnect and/or would inform each other as the study progresses.

Project personnel and management: The research and management roles of each of the senior personnel on the project must be described in brief within the project description. Collaborative teams representing multiple disciplines are typical in REESE projects. In addition, at least one of the senior personnel must be designated as the methodology and/or measurement leader of the project. In single-investigator projects, this person will necessarily be the principal investigator. In multi-investigator projects, this person must be listed among senior personnel if the individual is not the principal or a co-investigator.

Where projects request time for students and other trainees, the project description should be clear on their roles and responsibilities. Investigators are reminded that all proposals requesting funds to support postdoctoral researchers are required by NSF to submit a one-page mentoring plan within the supplementary documents section or the proposal will be returned without review.

REESE encourages the inclusion of women, persons with disabilities, underrepresented racial and ethnic groups, and diverse viewpoints as investigators and/or as participants. REESE encourages minority-serving institutions (MSIs) to apply. Additionally, institutions are encouraged to partner with MSIs, their faculty, and their students as appropriate.

Dissemination: All REESE projects are expected to accumulate and communicate knowledge to relevant research, policy, practitioner, and other communities. As part of DRL's strong and unwavering commitment to the broader impacts of funded research, reports from successful REESE projects must be published in peer-reviewed professional or scholarly journals, and findings (positive or negative) must be disseminated through appropriate means to audiences relevant to the goals of the project. Projects are expected to impact appropriate audiences across disciplinary boundaries. Furthermore, projects are encouraged to identify innovative ways to communicate their findings to researchers, practitioners, policymakers, and the public. Projects will also be expected to share research designs, findings, and overall project information with the REESE Diffusion and Evaluation Network, the Center for Advancing Research and Communication (ARC) at the University of Chicago (http://arc.uchicago.edu/reese/). Awarded projects must report annually to ARC using an online data system.

Project Evaluation: All projects must have an evaluation plan that is appropriate to the goals of the project and explicitly describes the approach that the project team intends to use in assessing its successes and failures and meeting its milestones and

objectives. Project evaluations should be sufficiently distant from the project to be objective but should be designed to be of most help to the project team pursuant to its responsibilities to the field.

All projects must have a substantive external expert review mechanism (e.g., advisory committee) that provides regular feedback on the project's research methods and progress, analysis procedures, interpretation of data into findings, and dissemination activities. In some cases, this may be all that is necessary. In other cases, additional external evaluation might be more appropriate, given the nature of the project. Finally, proposals should describe how evaluation input will be used to shape the project.

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

Budget Preparation Instructions: A careful and realistic budget in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG), consistent with the proposed activities, and including a request for funds to cover the cost of attendance of the PI at each year's annual awardee meeting in the Washington, DC area should be submitted with the proposal.

C. Due Dates

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

    July 17, 2012

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 where they will be reviewed if they meet NSF proposal preparation requirements. 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 who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with the 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.

A. NSF Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board (NSB)-approved merit review criteria: intellectual merit and the broader impacts of the proposed effort. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two NSB-approved merit review criteria are listed below. The criteria include considerations that help define them. These

considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which the reviewer is qualified to make judgments.

What is the intellectual merit of the proposed activity?

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative, original, or potentially transformative concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

Examples illustrating activities likely to demonstrate broader impacts are available electronically on the NSF website at: http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf .

Mentoring activities provided to postdoctoral researchers supported on the project, as described in a one-page supplementary document, will be evaluated under the Broader Impacts criterion.

Additional Solicitation Specific Review Criteria

Proposals to the BPR tracks for the REESE, RDE, and GSE programs will be jointly reviewed by DRL and HRD.

NSF staff also will give careful consideration to the following in making funding decisions:

Integration of Research and Education

One of the principal strategies in support of NSF's goals 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 diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- 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.

B. Review and Selection Process

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

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

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

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

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

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

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

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

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period. (Some programs or awards require more frequent project reports). Within 90 days after 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 that PI. 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 FastLane, for preparation and submission of annual and final project reports. Such reports provide information on activities and findings, project participants (individual and organizational), publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system. Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report 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.

The REESE program has awarded a dissemination and evaluation network project as a cooperative agreement. The resource network is responsible for synthesizing findings across the REESE portfolio, providing technical assistance to REESE projects, promoting national awareness of research contributions from the REESE portfolio, and building the REESE community through PI and special interest meetings. All REESE projects are expected to share their proposals and findings with the resource network, to participate in annual PI meetings, and other meetings of interest and to be responsive to requests for information from the resource network.

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 REESE program officers, telephone: (703)292-8650, email: DRLREESE@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.

Contact cognizant Program Officers at DRLREESE@nsf.gov.

IX. OTHER INFORMATION

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

identified interests. Users can subscribe to this service by clicking the "Get NSF Updates by Email" link on the NSF web site.

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

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

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

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

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

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

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230

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

- **TDD (for the hearing-impaired):** (703) 292-5090

- **To Order Publications or Forms:**

  Send an e-mail to: nsfpubs@nsf.gov

  or telephone: (703) 292-7827

- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

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

instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

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

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

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