Informal Science Education (ISE)

Program Solicitation

NSF 06-520
***Replaces Document* NSF 05-544**

National Science Foundation
Directorate for Education and Human Resources
Division of Elementary, Secondary and Informal Education

Preliminary Proposal Due Date(s) ***(required):***

March 21, 2006

for Project Grants

September 14, 2006

for Project Grants

Second Thursday in March

thereafter

Second Thursday in September

thereafter

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

June 22, 2006

for Project Grants

December 14, 2006

for Project Grants

Third Thursday in June

thereafter

Second Thursday in December

thereafter

Planning Grants: Proposals must be submitted on the same deadline dates as those indicated above for Preliminary Proposals, following discussion with a Program Officer.

Conference, Symposia, and Workshop Grants: Proposals may be submitted at any time, generally at least one year in advance, following discussion with a Program Officer. These types of projects do not require Preliminary Proposals.

Grant Supplements for existing ISE Awards: Requests must be submitted at least two months prior to the need for additional funds, following discussion with the Cognizant Program Officer.

REVISIONS AND UPDATES

In furtherance of the President's Management Agenda, in Fiscal Year 2006, NSF has identified programs that will offer proposers the option to utilize Grants.gov to prepare and submit proposals, or will require that proposers utilize Grants.gov to prepare and submit proposals. Grants.gov provides a single Government-wide portal for finding and applying for Federal grants online. A complete listing of these programs is available on the Policy Office website at: http://www.nsf.gov/bfa/dias/policy.

In response to this program Solicitation, proposers may opt to submit proposals via Grants.gov or via the NSF FastLane system. In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

A. Collaborative Proposals. All collaborative proposals must be submitted via the NSF FastLane system. This includes collaborative proposals submitted:

- by one organization (and which include one or more subawards); or
- as separate submissions from multiple organizations.

Proposers are advised that collaborative proposals submitted in response to this Program Solicitation via Grants.gov will be requested to be withdrawn and proposers will need to resubmit these proposals via FastLane. (Chapter II, Section D.3 of the Grant Proposal Guide provides additional information on collaborative proposals.)

B. All Other Types of Proposals That Contain Subawards. All other types of proposals that contain one or more subawards also must be submitted via the NSF FastLane system.

The following item is a major revision to the previous program Solicitation:

As a special emphasis for serving professional audiences, this Solicitation includes a request for proposals for establishing an **Informal Science Education Resource Center**; see Section II.A.3.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Informal Science Education (ISE)

Synopsis of Program:

The ISE program invests in projects that develop and implement informal learning experiences designed to increase interest, engagement, and understanding of science, technology, engineering, and mathematics (STEM) by individuals of all ages and backgrounds, as well as projects that advance knowledge and practice of informal science education. Projects may target either public audiences or professionals whose work directly affects informal STEM learning. ISE projects are expected to demonstrate strategic impact, innovation, and collaboration.

Cognizant Program Officer(s):

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

- 47.076 --- Education and Human Resources

Eligibility Information

- **Organization Limit:**

  Only U.S. organizations located in the U.S. are eligible to apply; see Grant Proposal Guide for further information.

- **PI Eligibility Limit:**

  An individual may be included as a Principal Investigator (PI) in no more than the following numbers of proposals under ISE consideration at the same time: one Full Proposal for a Project Grant; one Preliminary Proposal for the next round of Project Grants; one Planning Grant proposal; and one Conference, Symposia, and Workshop Grant Proposal. However, a PI in one proposal may be a Co-Principal Investigator or project team member on other proposals submitted to this Solicitation.

- **Limit on Number of Proposals:** See Section III, Eligibility Information, for specific limitations.

Award Information

- **Anticipated Type of Award:** Standard or Continuing Grant or Cooperative Agreement
- **Estimated Number of Awards:** 50
- **Anticipated Funding Amount:** $25,000,000 in FY 2006, pending availability of funds; see Section IV.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Preliminary Proposals:** Submission of Preliminary Proposals is required. Please see the full text of this solicitation for further information.

- Full proposals submitted via FastLane:

  - Grant Proposal Guide (GPG) Guidelines apply.

- 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/bfa/dias/policy/docs/grantsgovguide.pdf) To obtain copies of the Application Guide and Application Forms Package: click on the Apply tab on the Grants.gov website, 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.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required by NSF.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

- **Preliminary Proposals *(required)* :**
  March 21, 2006
  for Project Grants
  September 14, 2006
  for Project Grants
  Second Thursday in March
  thereafter
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- **Full Proposal Deadline Date(s)** (due by 5 p.m. submitter's local time):
  June 22, 2006
  for Project Grants
  December 14, 2006
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  Third Thursday in June
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Proposal Review Information

- **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.

TABLE OF CONTENTS

I. INTRODUCTION

Informal learning happens throughout people's lives in a highly personalized manner based on their particular needs, interests, and past experiences. This type of multi-faceted learning is voluntary, self-directed, and often mediated within a social context (Falk, 2001, Dierking *et al*., 2004); it provides an experiential base and motivation for further activity and subsequent learning. The ISE program invests in the development of experiences that encourage informal learning in science, technology, engineering, and mathematics (STEM). It promotes public engagement with and understanding of STEM through such means as exhibitions, media projects, and educational programs. ISE projects reach audiences of all ages and backgrounds across the nation in museums, theaters, community centers, and many other settings, including outdoor environments and their homes.

The Informal Science Education (ISE) program supports activities at the frontiers of informal science learning that further the state-of-the-art through a cycle of knowledge accumulation and improvement of practice (Rand Mathematics Study Panel, 2003). In this cycle, effective practice, whether implemented through an exhibition, program, or other means, is based to the greatest extent possible on prior related work and current research in learning. Evaluation of practice leads to findings that provide insights and questions for research. Subsequent research generates new knowledge that in turn will inform the development of improved informal learning experiences. By funding projects along this cycle, the ISE program can strengthen connections between research and practice and thereby enhance the capacity of the field to educate the public in informal settings.

The ISE program invests in projects that directly target public audiences for self-directed STEM learning through such means as permanent and traveling exhibitions; films; television and radio series; web-based projects; citizen science programs; and youth and community programs. In addition, the program supports projects that target ISE professionals to further knowledge and the implementation of practice, such as through research studies, conferences, formation of networks, and professional development; these projects should strengthen the infrastructure for informal science learning by the public. (Note that this program does *not* fund operational or capital expenses, vehicles, major or office equipment, tuition, school field trips, camps, science fairs or other competitions, or projects whose primary focus is health or medicine.) Although ISE encourages projects to support formal education, the primary audience must be informal; see Section IX for other programs within the Division of Elementary, Secondary, and Informal Education that invest in projects specifically targeting K-12 education.

To achieve the greatest return on its investments, the ISE program encourages projects that will "raise the bar" in the field of informal science education. It seeks to invest in projects that advance the leading edge of the field and address its most critical challenges. Thus, in making funding decisions, the program will place particular emphasis on the ability of projects to demonstrate the characteristics of strategic impact, innovation, and collaboration.

a. ***Strategic Impact****:* Further knowledge or practice of informal science education through new or more effective approaches, strategies, findings, or models. Strategic impact refers to how the project **advances the ISE field overall** by addressing key needs, challenges, and opportunities. It does not refer to project impact on audiences or communities. By identifying and influencing a leverage point for moving the field forward in a meaningful way, a project can extend impact beyond the lifetime of the grant or the project deliverables. Note that strategic impact can

be achieved by organizations regardless of their size or the population of the communities that they serve.

The following are examples of ways in which projects might achieve strategic impact by creatively addressing issues critical for the field, as well as potentially demonstrating innovation and collaboration. (This list is intended to be illustrative; it is not in a priority order, nor are proposed projects limited to these areas.)

- Sustaining informal learning experiences and encouraging subsequent learning that go beyond one-time or a limited set of activities.
- Creating programs that help museums and other informal learning organizations become truly engaged with and integral to their diverse communities.
- Forming new types of collaborations that build capacity by integrating resources and expertise among informal learning organizations and across different modes of informal learning.
- Exploring more effective strategies for engaging underserved audiences in culturally-responsive ways that broaden participation by significantly increasing the numbers impacted by informal science learning.
- Developing new formats and innovative approaches to existing ones, such as exhibitions and media; developing innovative informal educational applications that take advantage of unique capabilities of the Internet.
- Creating new models by which informal learning organizations can take advantage of university-based research expertise in STEM areas and learning, while helping researchers achieve broader impacts.
- Proposing improved models and new research areas based on empirical evidence that contribute to the understanding of informal STEM learning.
- Designing applied research projects that address key issues for practitioners, such as which practices are most effective in designing and implementing experiences that promote STEM learning.
- Implementing evaluation projects that assess what measures best capture the impacts offered by different forms of informal learning experiences.
- Enhancing learning through the social interaction that naturally occurs as part of the context of most informal learning experiences.
- Harnessing the rapidly growing population of older adults many of whom will be seeking opportunities for informal learning and for community engagement.
- Reaching very young children in ways that build upon increased knowledge of brain development and early childhood education.
- Promoting the development of the next generation of diverse leadership for the informal science education field.
- Finding more effective ways to disseminate knowledge of the state-of-the-art as a base from which the field can build.

b. ***Innovation****:* "Push the envelope" through creative means to further informal science education. In a manner similar to NSF programs that fund the frontiers of STEM research, ISE seeks to fund projects at the **frontiers of informal science education** that will advance the state-of-the-art. To demonstrate innovation, PIs must show a thorough understanding of current practice and knowledge in areas related to the project and then indicate how what is proposed builds on and extends that prior work.

Innovation applied to critical ISE issues, as in the examples previously mentioned, provides a means by which projects can achieve strategic impact. Projects also can demonstrate innovation in many other ways, including new types or combinations of deliverables, improvements in the deliverables, or their deployment in a different manner. The project as a whole may be innovative, or it may be innovative in aspects related to achieving the intended impacts, such as the process by which its products are developed. Since innovation often carries risk, the PI must be able to demonstrate an understanding of possible risks entailed and how they will be managed.

c. ***Collaboration****:* Leverage the resources of partners to achieve more significant outcomes than would otherwise be possible. Organizations should seek to extend project impacts by taking advantage of the synergies generated by the competencies and resources of carefully chosen partners.

Partnerships and alliances can be challenging to implement and sustain, but they often make it possible to achieve much greater project impact. Organizational partners can bring complementary resources and expertise that significantly expand the capacity of the project team, as well as provide access to new or nontraditional audiences. Thus collaboration can enhance the diversity of a project in terms of its geographic reach, target audiences, and other key attributes. It can play another valuable role by building capacity within participating organizations, especially those that have more limited resources. Partners should be selected strategically based on their ability to attain and extend intended project outcomes. PIs must

demonstrate an understanding of the challenges of collaboration and propose means for addressing them. Collaborators should be involved in the development of the proposed project and preparation of the proposal.

By funding projects that demonstrate strategic impact, innovation, and collaboration, the ISE program invests its resources in activities that most effectively further the engagement and understanding of STEM by all Americans, as well as the institutions and organizations that serve them. This focus supports the broader mission of the Elementary, Secondary, and Informal Education (ESIE) Division and the Education and Human Resources (EHR) Directorate to achieve excellence in U.S. science and engineering education at all levels and in all settings, and to ensure the development of a diverse and well-prepared workforce of scientists, engineers, mathematicians, technicians, and educators--and a well-informed citizenry. It is especially important at a time when science and technology play accelerating roles in our everyday lives, in an increasingly competitive global marketplace, and in guiding local and national policy.

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II. PROGRAM DESCRIPTION

A. **ISE Project Grants**

Project Grants (Full Proposals) are the primary means in which the ISE program invests in projects that develop and implement informal learning experiences for the general public. These projects have as their primary audience informal learners, from young children to senior citizens. The program also supports projects that enhance the infrastructure of informal science education. Therefore, the ISE program targets both public and professional audiences, as follows.

1. **Public Audiences**: For self-directed learning in informal settings.

   Projects should seek national, significant regional, or community-wide reach, depending on the methods used. They should create and sustain audience engagement through effective ISE techniques. Proposed projects should be grounded in both research and practice, building on the prior work, experience, and findings of others.

   Proposals in this category must meet the following requirements:

   Audience: The *primary* target audience must be informal learners, which may include families; children and youth; and adults. In contrast with formal learning, informal learning refers to those activities that are *not* primarily for school use, home schooling, part of an ongoing school curriculum, or require mandatory participation. Thus, students and teachers are considered *secondary* audiences for the ISE program; however, projects are strongly encouraged to support formal education by creating linkages to national and state standards and other means. Impacting underserved and nontraditional audiences is a vital program goal.

   Method: The proposed activities must be based on voluntary, self-directed learning by the primary target audience. Project deliverables include, but are not limited to, exhibitions, media of all types, and educational programs. Summer or holiday camps, school field trips, science fairs, and competitions are *not* supported through this program. ISE also does not fund development of a print publication or a curriculum as the primary public deliverable.

   Location: Project activities may be carried out in any location that reaches the intended target audience outside of formal education settings, such as in a museum (e.g., science-technology center, natural history museum, zoo, aquarium, planetarium, arboretum or botanical garden, history or art museum); community center; library; theater, the home or outdoors. PIs should consider reaching audiences at venues and web sites already frequented by the target audiences, in addition to projects intended to attract audiences.

   Content: The content of proposed projects must be based on one or more of the STEM research fields supported by NSF. They include: astronomy, atmospheric science, biological sciences, behavioral sciences, chemistry, computer science, earth sciences, engineering and technology, information sciences, materials research, mathematical sciences, oceanography, physics, and social sciences. ISE does not fund projects whose primary focus is health or medical education.

2. **Professional Audiences**: For enhancement of informal STEM learning, knowledge, infrastructure, or systems.

ISE seeks innovative projects that address issues central to improving understanding of the principles and implementation of the practice of informal science education. Projects that target professionals might involve research and development in informal science learning; formation of collaboratives, consortia, or networks that bring institutions together; field-wide professional development; or other strategies for strengthening the infrastructure for informal STEM learning. While seeking to advance the field, the program also is interested in increasing professionalization of informal science education staff, institutions, and practices. Courses, with or without credit, are *not* funded.

Proposals in this category must meet the following requirements:

Organization or Institution: Projects may impact organizations or institutions; e.g., national or regional associations; museums (science-technology center, natural history museum, zoo, aquarium, planetarium, arboretum or botanical garden); community organizations; television and radio stations or networks, or others that directly affect informal STEM learning.

Audience: Targeted individuals may include: staff, managers, board members, researchers, evaluators, funders, media producers or disseminators, exhibit designers, or other professionals *whose work directly impacts informal science education*.

3. **Informal Science Education Resource Center**: For supporting the field, Principal Investigators, and the ISE program.

As a special emphasis for professional audiences under this Solicitation, ISE seeks proposals that will result in a single award (as a cooperative agreement) for the development and implementation of an Informal Science Education Resource Center (ISERC). The ISERC should consider as its scope the broad domain of informal science education, including all forms of informal STEM learning activities and organizations.

Audience: The ISERC should serve the following primary audiences; activities need not be limited to those described.

- *Informal Science Education Field*. The ISERC should build capacity across the field and support continued professionalization. It should foster a community of practice that bridges the many varied forms in which informal STEM learning experiences are developed and delivered for informal audiences of all ages, as well as further knowledge transfer between research and practice. Activities serving the field should include: clearinghouse on ISE-funded awards to enable others to learn from and build upon this body of prior work; identification and dissemination of promising practices and findings based on project evaluations; and leadership development, with emphasis on increasing the diversity of the field. As a secondary emphasis, the ISERC should seek to share relevant informal learning knowledge and practices with formal educators and university researchers.
- *ISE Principal Investigators*. The ISERC should serve both existing PIs and prospective PIs. It should help create a network among ISE awardees through PI meetings, communications, and other methods that encourage sharing of deliverables, practices, and findings across projects. It should encourage new PIs, particularly from underrepresented regions and groups, through orientation to the ISE program by web conferences, proposal development workshops, and other means.
- *ISE Program*. The ISERC should assist the ISE program in gathering and assessing evidence of impact across the portfolio, as well as analyzing the awards portfolio. (In this regard, it will have access to an ISE database being developed from project baseline, annual, and final reports.) It also will assist in identifying reviewers, gathering "nuggets" for internal use, and communicating information externally about the ISE program.

Lead Organization: The lead organization must be able to demonstrate significant experience in managing or providing services similar to those proposed.

Collaboration: The ISERC is intended to be synergistic with existing activities of professional associations and other resources offered through organizations and institutions engaged in informal science education.

Evaluation: Proposals must include assessment of the impacts of the ISERC by an external evaluator.

B. **Other Types of ISE Grant Proposals**

ISE also may make a limited number of awards in the following special grant categories.

1. **Planning Grants**

Planning grants are intended for the exploratory phase of highly innovative projects or aspects of complex ISE projects that require resources *beyond those usually needed for proposal development*. Proposers are strongly encouraged to talk with an ISE Program Officer before submitting a planning proposal.

Proposers should be sufficiently advanced in their project conceptualization to be able to present a developed outline, including the suggested approach of the final project and a clear description of the planning activity's outcomes and methods. Planning grants can be used for any type of informal science education activity such as an exhibition, museum activity, media project, community program, or web-based project that would be appropriate for ISE funding based on this Solicitation. Examples include demonstration of the proof of concept or a focused planning effort for a large national or regional collaboration.

Awards may provide up to $75,000 total for up to two years. The award of a planning grant does not in any way obligate NSF or ISE to fund in whole or in part the final project; submission of a project grant proposal for implementation is independent of the planning grant.

Format: See Proposal Preparation and Submission Instructions (V.A.) for specific information.

2. **Conference, Symposia, and Workshop Grants**

Conferences, symposia, and workshops provide a specific format for certain projects targeting professionals. Conferences are one way that ISE can provide support to build capacity in the field of informal science learning. These special grants are intended to assemble experts for purposes of discussing issues of relevance to the informal learning community; the primary target audiences must be **ISE professionals**, not the general public or professionals primarily from other fields. For example, conferences may be based on promoting new partnerships and collaborations, or exploring findings and effective practices in such areas as informal learning research and evaluation. Outcomes from these awards are expected to extend beyond publication of the proceedings or a report. Proposers are strongly encouraged to seek guidance from an ISE Program Officer before submitting a conference proposal.

Requests generally should be made *at least one year in advance of the scheduled date* to allow sufficient time for proposal processing and for arrangements should the proposal be funded. Conferences or meetings and the facilities in which they are held must be accessible to participants with disabilities. The range of these awards is between $50,000 to $250,000. The budget may include publication costs; dissemination must be a major project component.

Format: Proposals should be submitted using the guidelines for full proposals; see Proposal Preparation and Submission Instructions (V.A.) for specific information. Proposals must identify the intended audience of ISE professionals; how participants will be invited or selected; tentative agenda and speakers; promotion and marketing plan; post-conference deliverables; and dissemination. For further information, also see Grant Proposal Guide (GPG), Chapter II, Section D.7.

3. **Grant Supplements**

For existing ISE awards, ISE will consider requests for small amounts of supplemental funding to ensure completion of the original scope of work based on changes in conditions after the award was made or to take advantage of opportunities to extend further the project impact. Supplemental funding will not be approved for such purposes as defraying costs associated with increases in salaries or additional indirect cost reimbursement (see GPG Chapter V, Section B.4). For standard and continuing awards, ISE supplements are limited to $200,000 or 20% of the total award amount, whichever is less; only one supplement will be considered per ISE award. (These limitations do not apply to cooperative agreements.) For their Supplement requests to be considered, PIs must be up-to-date in the submission of Annual Reports. Awardees are strongly encouraged to discuss the need with the Cognizant Program Officer prior to submission.

Format: Requests for supplemental funding must include an update of the progress of the original grant including data to support progress, description of the proposed work (including rationale, audience, design, evaluation), a budget for the requested funds, and a narrative justification of expenses. Proposals are submitted using the Supplemental Funding Request function in FastLane.

Note

Except under exceptional circumstances that justify consideration of a proposal outside the normal process, ISE does not encourage submission of Small Grants for Exploratory Research (SGER) proposals or unsolicited proposals. PIs are strongly encouraged to discuss their projects with Program Officers before considering preparation of proposals in these categories.

For Further Information

www.informalscience.org: Resource for research and techniques related to informal science learning.

www.nsf.gov: Information regarding both the NSF Education and Human Resources (EHR) Directorate and the Division of Elementary, Secondary and Informal Education (ESIE).

III. ELIGIBILITY INFORMATION

Organization Limit: Only U.S. organizations located in the U.S. are eligible to apply; see Grant Proposal Guide.

PI Eligibility Limit: An individual may be included as a Principal Investigator (PI) in no more than the following numbers of proposals under ISE consideration at the same time, as follows: one Full Proposal for a Project Grant; one Preliminary Proposal for the next round of Project Grants; one Planning Grant proposal; and one Conference, Symposia, and Workshop Grant Proposal. However, a PI in one proposal may be a Co-Principal Investigator or project team member on other proposals submitted to this Solicitation.

Limit on Number of Proposals: An institution or organization may serve as lead in no more than the following numbers of proposals under ISE consideration at the same time: three Preliminary Proposals and three Full Proposals for Project Grants; three proposals in total for Planning Grants and/or Conference, Symposia, and Workshop Grants. A proposal that is substantially similar to another proposal from the same institution or organization that is under consideration by ISE or other NSF program will be returned without review.

IV. AWARD INFORMATION

The ISE program expects to make approximately 50 awards as Project Grants, Planning Grants, Conference, Symposia, and Workshop Grants, and Grant Supplements based on anticipated funding of $25 million in FY 2006 for new awards. They will be made as Standard or Continuing Grants, with the exception of the Informal Science Education Resource Center award,

which will be made as a Cooperative Agreement and may be renewed for an additional five years, subject to external merit review and availability of funds. The anticipated date for funding decisions is approximately seven months from submission.

Duration and Funding Level

ISE Project Grants: Project duration may be from one to five years. The level of funding depends on the nature and scope of the project. Awards may range from $100,000 to a maximum of $3 million for up to five years, with the exception of the Informal Science Education Resource Center, which may be funded to a maximum of $5 million over five years.

Planning Grants. Project duration is to be no more than two years. The maximum award is $75,000.

Conference, Symposia, and Workshop Grants. Project duration is expected to be no more than two years. The range for these awards is approximately $50,000 to $250,000.

Grant Supplements. The maximum award is $200,000 or 20% of the total amount of the original award, whichever is less. (This limitation does not apply to cooperative agreements.)

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Preliminary Proposals *(required):*

Preliminary proposals may only be submitted via FastLane, even if full proposals may be submitted via FastLane or Grants.gov.

Proposals submitted in response to this 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 pubs@nsf.gov.

A Preliminary Proposal (or Preproposal) is required in order to submit a full proposal for a Project Grant (but *not* proposals for Planning Grants; Conference, Symposia, and Workshop Grants; or Grant Supplements). Preliminary Proposals provide an opportunity to assess the responsiveness of the project to the ISE guidelines and the potential to compete successfully in the merit review process.

Preliminary Proposals must be submitted in FastLane no later than 5:00 p.m. local time on the due date immediately prior to the Full Proposal submission date. They are required in all cases, including resubmission of a proposal that has been previously declined. In the case of a resubmission, the proposal must be substantially revised. A new Preliminary Proposal is required for each round of competition.

The response to a Preliminary Proposal is either to encourage or discourage submission of a full proposal for a Project Grant based on assessment by reviewers of the likelihood that a proposal based on the concept presented will be competitive. This assessment is advisory, and Full Proposals may be submitted in either event. Written reviews provide feedback to PIs to strengthen their proposals.

The following instructions apply to preliminary proposals submitted to this Program:

Submission of a Preliminary Proposal requires completion of the following forms in FastLane. No additional NSF forms are required.

1. **COVER SHEET.** Be sure to include the program solicitation number and to check the Preliminary Proposal (or Preproposal) box.

2. **PROJECT SUMMARY**. The Summary is a critical proposal element that must make the essence of the project clear to the reviewer. It must succinctly identify the project's Intellectual Merit and Broader Impacts in separate sections under these two headings and include the following information:

Intellectual Merit

- Deliverables: brief description
- Project Design: rationale for selecting deliverables and how they build on prior work
- Project Team: key participants and roles
- Partnerships: collaborating organizations and roles

Broader Impacts

- Audience (Public or Professional): identification of target audience and intended impacts
- Impact Evaluation: how project success will be determined
- Strategic Impact: how the project will advance the field of informal science education

If Intellectual Merit and Broader Impacts are not explicitly identified, the proposal will be returned without review. The Project Summary is limited to one single-spaced page.

3. **PROJECT DESCRIPTION.** The narrative is a condensed version of the Project Description for a Full Proposal that is limited in length to six single-spaced pages. It must identify the essential features of the project in terms of Impact, Innovation, and Collaboration as described in the Project Description for a Full Proposal.

    a. *Impact.* Summarize the public or professional target audience; intended public or professional impact; means for evaluating impact, including the external evaluator; and intended strategic impact.

    b. *Innovation.* Briefly describe the primary project deliverables; how they will achieve the intended impacts; their primary STEM content; the project plan; and how it builds on research and prior work.

    c. *Collaboration.* Identify the senior staff; advisory committee members; consultants; contractors; and primary organizational partners, describing how they will achieve impacts through collaboration not otherwise possible.

4. **BUDGET** (including Justification). The support requested from NSF should be entered in the budget forms generated in FastLane. It is not necessary to enter the budget for each year; an overall budget for the project is sufficient. In the event that the project requires funding from sources in addition to NSF, the budget justification must identify the total project budget.

5. **SUPPLEMENTARY DOCUMENTS.** Additional documents will NOT be accepted for Preliminary Proposals without written Program Officer approval.

    Other Fastlane forms (i.e., References, Biographical Sketches, Current and Pending Support) should NOT be submitted.

Full Proposal 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 announcement/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 pubs@nsf.gov. Proposers are reminded to identify this program announcement/solicitation number in the program announcement/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/bfa/dias/policy/docs/grantsgovguide.pdf). 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 pubs@nsf.gov.

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

*A. Collaborative Proposal*s. All collaborative proposals must be submitted via the NSF FastLane system. This includes collaborative proposals submitted:

- by one organization (and which include one or more subawards); or
- as separate submissions from multiple organizations.

Proposers are advised that collaborative proposals submitted in response to this Program Solicitation via Grants.gov will be requested to be withdrawn and proposers will need to resubmit these proposals via FastLane. (Chapter II, Section D.3 of the Grant Proposal Guide provides additional information on collaborative proposals.)

B. All Other Types of Proposals That Contain Subawards. All other types of proposals that contain one or more subawards also must be submitted via the NSF FastLane system.

The following instructions apply to ISE Project Grant proposals and to Conference, Symposia, and Workshop Grant proposals. Instructions specific to Planning Grant proposals are described in the section that follows.

If a proposal is resubmitted after being previously declined, it must be substantially revised, responding to concerns raised in the written reviews and Panel Summary. If not, the proposal will be returned without review. For proposals based on Planning Grants, the Final Report must have been submitted by the Full Proposal deadline date.

All proposals must include: Cover Sheet, Project Summary, Project Description (Narrative), References Cited, Biographical Sketches, Budgets (including Justification), Current and Pending Support, and Supplementary Documents (if required). Specific requirements for ISE that supplement the GPG Guidelines and NSF Grants.gov Application Guide are described below.

1. **COVER SHEET**

   Proposers are reminded to include the number of this Solicitation and the number of the Preliminary Proposal submitted for the deadline date immediately preceding the full proposal due date; failure to do so will delay processing of the proposal. (Note for Grants.gov users: enter Preliminary Proposal number in block 4 of SF 424 (R&R).)

2. **PROJECT SUMMARY**

   The Summary is a critical proposal element that must make the essence of the project clear to the reviewer. It must succinctly identify the project's Intellectual Merit and Broader Impacts in separate sections under these two headings and include the following information:

   Intellectual Merit

   - Deliverables: brief description

- Project Design: rationale for selecting deliverables and how they build on prior work
- Project Team: key participants and roles
- Partnerships: collaborating organizations and roles

Broader Impacts

- Audience (Public or Professional): identification of target audience and intended impacts
- Impact Evaluation: how project success will be determined
- Strategic Impact: how the project will advance the field of informal science education

If Intellectual Merit and Broader Impacts are not explicitly identified, the proposal will be returned without review. The Project Summary is limited to one single-spaced page.

3. **PROJECT DESCRIPTION (NARRATIVE)**

For consideration by the ISE program, **the Project Description or Narrative must follow the format described (Impact, Innovation, Collaboration) and must explicitly address the questions in this Solicitation under these headings.** Proposals that do not follow these instructions will be returned without review. It is not necessary to retype these questions in the narrative, however. The Project Description is limited to 15 single-spaced pages in length. Although certain Supplementary Documents may be necessary, the Project Description is the primary means for presenting the project to reviewers and must be able to stand on its own.

ISE strongly encourages PIs to develop projects by working "backwards" from the desired strategic and audience impacts rather than starting with a particular deliverable, such as an exhibition or television series. For this reason, the sequence of questions to be addressed here starts with the project impacts and the target audiences, then the deliverables, project design, project team and partners for achieving the intended impacts.

a. **Impact**

This section of the Project Description describes the target audience (public or professional), knowledge of that audience, underserved audiences reached, audience impacts, evaluation of that impact, and strategic impact on the ISE field.

1. *AUDIENCE. Who is the primary intended public or professional audience for your project?*

   For ***public*** audiences: *Who is the primary target audience for this project in terms of age range and other attributes? How many individuals will be directly reached by this project during the award and up to five years following the grant period? Provide a basis for this estimate. How does this project maximize reach to audiences nationally, regionally, or community-wide?*

   Or for ***professional*** audiences: *What are the types of informal learning organizations on which your project will have the greatest impact? What categories of informal learning professionals does your project specifically target to achieve this impact?*

   The target audience must be clearly identified. It is unlikely for a single project to impact all segments of the general public. Proposals should indicate how particular target audiences were selected. Projects should seek to sustain audience impact beyond the life of the award. Impact often can be extended through strategic collaboration with organizations that offer additional access to target audiences. ISE seeks diversity in the audiences that are reached and the geographic locations where they reside.*What do you already know about the knowledge, interests, attitudes, and needs of your target audiences? How do you know?*

Successful proposals are based on knowledge of the target audiences, as well as identification of significant challenges and opportunities for enhancing informal science learning. Initial front-end research, whether carried out informally or as a formal study, may be necessary for obtaining this audience information. Although firmly based in STEM content, *competitive ISE projects are audience-focused rather than content-driven.*

How does this project increase participation of underserved audiences in STEM? Describe your strategies for attracting and engaging these audiences.

Broadening participation in STEM is a major program goal. ISE seeks to contribute to the development of a diverse, internationally competitive and globally-engaged workforce of scientists, engineers, and technicians, in addition to informed citizens. Activities should stimulate participation of underserved and underrepresented groups (e.g., minorities, girls and women, persons with disabilities, youth and adults from economically disadvantaged areas) or regions (e.g., rural areas, small towns, and urban areas). Projects should seek to match program content to the needs of diverse audiences, target their communities, partner with youth and community organizations that serve them, and incorporate appropriate strategies for outreach and project dissemination.

2. *AUDIENCE IMPACT. What are the intended impacts of your project on its target audiences? Identify the most important intended audience impacts (up to three). For each, indicate how you will measure or assess that impact and what value of that measure or evidence will serve as your criterion for defining project success. Explain your selections and provide a rationale.*

   Audience impacts should be specific, realistic, and achievable through the deliverables and strategies proposed. The measures that you indicate here for judging the success of your project must be integral to its evaluation, as described in the following section. If project deliverables are to continue beyond the duration of the award, PIs should demonstrate financial feasibility for doing so, if appropriate.

3. *IMPACT EVALUATION. What is the evaluation strategy you will use for the impact measures or assessments that you have identified? Provide a rationale. Include in the Supplementary Documents an evaluation plan that clearly identifies the methodologies that will be used for each impact measure.*

   All ISE projects should include plans for a summative evaluation based on qualitative and quantitative data that document the extent to which the intended impacts have been achieved, along with any unanticipated impacts. This study should seek to further knowledge and practice in informal learning by sharing lessons learned from both positive and negative findings. It should be conducted by an independent evaluator experienced in informal learning. For a basic introduction, see *The 2002 User-Friendly Handbook for Project Evaluation* (NSF 02-057). The web site www.informalscience.org posts information provided by evaluation firms that offer services in this area (these listings do not represent endorsement). ISE encourages publication and sharing of summative evaluation findings widely with the field; at a minimum, reports must be submitted to this web site or others indicated by ISE for dissemination.

4. *STRATEGIC IMPACT. What is the most critical strategic impact on the ISE field that your project intends to produce? What continuing impact is this project likely to have?*

   As described in more detail in Section I, projects must seek to produce a lasting impact on the field of informal science education ***in addition to the public or professional impact on target audiences***. Strategic impact may be achieved through new approaches, strategies, models, findings, and other means designed to advance the systems or institutions that

promote informal learning. Successfully addressing strategic impact requires demonstration of an understanding of the critical challenges facing the field. A plan for widely sharing results and practices is required. Project dissemination, while important, is not an end in itself, however, nor necessarily sufficient for achieving strategic impact. Potential for replication, if appropriate, should be presented.

b. **Innovation**

The next section of the Project Description describes the primary project deliverables and their development, project design, STEM content, how the project builds on prior work and educational research. PIs should explicitly indicate **how the proposed project elements demonstrate innovation**.

1. *PROJECT DELIVERABLES. What deliverables will your project produce that will lead to the intended impacts?*

   Proposers are encouraged to include complementary deliverables that are tightly integrated and created strategically to enhance the intended project impacts. Examples of deliverables for *public audiences* include: exhibition (permanent or traveling); film or video; educational program, kit, or materials; radio program or series; software; television program or series; web site. Examples of deliverables for *professionals* include: collaborative, consortium, or network; conference, seminar, or workshop; media programs; professional development; publication; research study; web site. The yearly status of each deliverable in the proposal should serve as a basis for assessing project progress in Annual Reports.

   Describe each deliverable in enough detail for reviewers to assess its ability to achieve the intended impacts, addressing the specific issues listed below by type of deliverable. Be sure to explain your "theory of action," the means by which the proposed deliverables will achieve the intended audience outcomes.

   a. Exhibit Deliverables

      Describe a walk-through from the visitor's perspective that highlights key design elements and experiences; the relationship of these experiences to STEM content; details about accessibility; and logistics of exhibition tour (if applicable). In Supplementary Documents, provide indications of interest or commitment from any participating or host institutions.

      ISE supports both traveling and permanent exhibits that are visitor-centered, inquiry-based, and promote active learning. Where possible, projects are encouraged to consider smaller versions of exhibits or exhibit components for dissemination to additional venues, such as small museums and science centers, libraries, and community centers. ISE expects exhibitions to meet ADA requirements and reflect principles of universal design.

   b. Media (Film, Video, Radio) Deliverables

      Explain the program or series content and format; how the content will be presented; and a plan for outreach and complementary products designed to extend the learning experiences of target audiences. In Supplementary Documents, provide a treatment or script for one or more programs; documentation of interest or commitment from a major national or regional broadcast or cable outlet, or an indication of interest and distribution plan for a non-

broadcast film; and sample of prior work.

Media deliverables are generally designed for national distribution. If a STEM topic is relevant to a particular area of the country, media projects designed for regional broadcast may be supported. Outreach activities must be integral to the project and tightly connected.

c. Research Deliverables

Present clearly-defined research questions, including identification of independent and dependent variables, where applicable; explain the methodologies used and their appropriateness to the project.

The objective of applied research studies should be to expand understanding of the knowledge or practice of effective informal STEM learning by investigating important aspects that have significant potential to advance the field. Research studies may be well-defined elements of a larger project for public audiences or a separate project for informal learning professionals. ISE expects proposals to meet the highest quality standards of publishable educational research. Methodologies should lead to valid and reliable results. The ISE program will not accept proposals essentially the same as any pending that have been submitted to the EHR Division of Research, Evaluation, and Communication (REC). Should IRB approval be required for the use of human subjects, ISE recommends that the PI begin the process as soon as the proposal is submitted.

d. Web Deliverables

Present organization of web site; user interface; examples of online activities; means for attracting and tracking users; accessibility. In Supplementary Documents, include a flow chart or logic model and descriptions of relevant prior work.

Effective web-based ISE deliverables should be interactive and take full advantage of the capabilities of the Internet to engage learners; exemplify scientific or technological processes; encourage off-line follow-up activities; provide feedback and guidance to users; have multiple entry points; and accommodate users with special needs to the extent possible. ISE does not support institutional web sites that primarily serve as marketing tools or basic information resources about institutions.

e. Youth and Community Program Deliverables

Describe the concept and organization of proposed programs; examples of activities; and key issues (e.g., participant recruitment, retention, and language barriers). In Supplementary Documents, provide documentation of commitment from all partners, local and regional/national; and samples of intended activities.

Creative project designs should provide participants with authentic STEM-based experiences. For example, projects might encourage family involvement in science

and mathematics activities, or allow participants to contribute to ongoing scientific research, as in citizen science. Youth and community projects result in high-quality program designs and the resources to support them including kits, activity materials, workbooks, information for parents, and multi-media products for national dissemination.

PIs that present new or improved models must clearly describe how what is proposed differs from and improves upon existing models. ISE may support prototype projects to be piloted and disseminated through a network of partnering organizations that leverage organizational strengths and resources.

2. *PROJECT DESIGN. How did you select the project deliverables and how will they be integrated to produce the greatest impact? What is your project plan? Identify key milestones in a timeline for their development, clearly indicating the status of every major deliverable by the end of each project year. Describe how the project will be sustained beyond the award, if appropriate.*

   Every component should be aligned in such a way as to enhance the ability of the project to achieve the intended impacts. ISE strongly encourages the integration of approaches and techniques across traditional boundaries to accomplish that end. The proposal must demonstrate how the deliverables address the needs and interests of a clearly defined target audience, segmented into audience subgroups as appropriate.

   What is the process by which each deliverable be developed to achieve the greatest impact, including the evaluation strategies used? Provide a rationale for the approaches taken.

   Front-end research should inform the planning of project deliverables, and formative research should be employed to obtain audience feedback at key stages in their development. For example, prototypes, pilot studies, or other forms of preliminary testing with target audiences are expected as part of the project design whenever possible. Projects also may include remedial evaluation where appropriate.

   What are the areas of greatest potential risk in successfully achieving the intended project impacts? Describe your strategies for minimizing these risks.

   In its efforts to advance the leading edge of informal science education, the ISE program is willing to support projects of higher risk that demonstrate the potential to yield significant payoffs. Proposals must demonstrate an understanding of those risks and identify appropriate measures for managing them.

3. *STEM CONTENT. What are the primary STEM disciplines for the project deliverables? Briefly describe the age-appropriate STEM content. What strategies will you use throughout the development process for ensuring the accuracy of content in deliverables and appropriateness to the target audiences?*

   ISE projects focus on STEM concepts and themes, skills, and processes. Appropriate STEM content encompasses all NSF program areas, including biology; computer and information sciences; engineering and technology; environmental sciences; geosciences; mathematics; physical sciences; and social, behavioral, and economic sciences. Strategies and mechanisms must be in place for ensuring accuracy of content and appropriateness to the target audience. Projects are encouraged to incorporate strategies for stimulating interest in STEM-related careers. ISE also seeks to engage the public in aspects of current research, including

emerging STEM content and NSF priority areas (currently biocomplexity in the environment; nanoscale science and engineering; mathematical sciences; and human and social dynamics), the process or nature of discovery and design, and the implications or consequences of research. PIs are encouraged to take advantage of the expertise and potential resources available from NSF-funded research projects. Connection of proposed content to student STEM education standards should be made whenever appropriate. While ISE requires a primary focus on STEM content, the program encourages connections to the humanities and arts, as well as proposals submitted by institutions representing those fields.

4. *EDUCATIONAL RESEARCH AND PRIOR WORK. How do your deliverables and project design build on specific findings from informal learning research? How do they build on and extend prior related work in the field? How do they build on prior NSF-funded work by the PI, if any?*

   Proposals must clearly demonstrate **how the proposed project builds upon prior practice and related work**, citing specific examples of related deliverables and how the project design and proposed deliverables benefit from the lessons learned. In addition, they must demonstrate that they are **soundly based on educational research in informal learning**, citing appropriate literature references to studies that warrant the proposed approaches. This section is critical to demonstrating how the project extends earlier work in meaningful ways.

   Results of Prior NSF Support. For NSF awards received within the past five years, the prospective PI or co-PI must describe the projects and especially the *outcomes* in sufficient detail for reviewers to assess their results. Full proposals based on Planning Grants must clearly demonstrate how the project builds on the results from that award. Each project should be identified by grant number, funding amount, period of support, title, summary of outcomes, and any publications or presentations that acknowledge the award. Key summative evaluation results and lessons learned should be succinctly described. Also, for projects based on Planning Grants, the Supplementary Documents **must** include an executive summary of the planning outcomes and findings; for other projects, synopses of evaluation studies (*not* entire reports) should also be included as Supplementary Documents. Note: NSF will not make a new award unless the PI and co-PIs have submitted all outstanding Final Reports.

c. **Collaboration**

This section of the Project Description describes the project team, the organizational partners, and the process by which they will achieve the intended impacts.

1. *PROJECT TEAM. For each of the following categories, who are the key project team members, their areas of expertise, their roles, and their extent of commitment to this project? Provide a rationale for your selections.*

   a. Senior Staff
   b. Advisory Committee Members
   c. Consultants
   d. Contractors

   Project leaders, key team members, and advisory committee members should collectively provide the expertise necessary to conduct the project, including relevant experience based in informal science learning, STEM content, knowledge of target audiences, any media used, and evaluation. Projects are encouraged to include members of underserved groups on their teams.

2. *PARTNERS. Who are your primary organizational partners? Identify each organization, its expertise, role in the project, extent of commitment, and contact*

person. Why were these partners selected? What has been the extent of their involvement in planning this project?

Potential partners could be drawn from informal learning organizations, media organizations, community organizations, professional associations, research institutions, school systems, and universities. (When the lead organization is a school system, university, or other entity for which informal learning is not the primary focus, it is strongly encouraged to partner with one or more informal learning organizations, which must be actively involved in the project.) Partners should be selected strategically based on their ability to achieve and extend project impacts. It is essential that project partners have been involved in the conceptualization of the project and preparation of the proposal. Letters of commitment from partners indicating their roles in the project should be included in the Supplementary Documents.

3. *COLLABORATION PROCESS. How will the project partner organizations work together to achieve the deliverables and produce impacts that would not otherwise be possible? Describe your management structure and strategy for fostering a true collaboration among the partners.*

   Implementing a successful collaboration is not simple. PIs should describe their process for collaboration, explaining how it builds on lessons learned from prior experience and from studies of collaboration.

4. **REFERENCES CITED**

Include here references to relevant research literature in informal learning and other areas that support the proposed strategies and approaches.

5. **BUDGETS**

Budgets should provide the most cost-effective means of producing the project deliverables and achieving the intended impacts. All budgets (grantee and subawards) must be accompanied by Budget Justifications that include itemizations corresponding to each FastLane or Grants.gov budget line item.

Funds cannot be requested for operational expenses other than those recovered through the organization's indirect cost rate, for graduate or undergraduate tuition, or for paid advertising. Requested equipment must be essential components of project deliverables, such as exhibits; office-type equipment and vehicles cannot be funded.

Include under Travel (E) the cost for the PI to attend a two-day meeting every other year at NSF. Any consultants listed in line G.3 must be compensated on a daily rate not to exceed the current NSF maximum. Each subaward on line G.5 requires a complete set of Proposal Budget forms accompanied by a Budget Justification that includes the basis for selecting the subawardee as well as itemization of expenses and explanations.

Projects with Budgets Greater than the NSF Request. Even though cost sharing is no longer required by NSF, should a project require other sources of funding, the scope and cost of the entire project must be provided in enough detail to identify the work to be performed and/or funded by parties other than NSF. Reviewers will need this additional information in order to assess the viability of the overall project, as well as the scope and budget to be funded by NSF. The anticipated sources and amounts of funding from other sources must be identified, along with all commitments at the time of submission. The estimated budget to be funded by sources other than NSF should not be entered on a FastLane or Grants.gov budget form, but presented separately using the same format and major budget categories for comparison with the NSF budget. These proposals must include in the Supplementary Documents a spreadsheet that presents the total project budget for each year and cumulative; rows should correspond to the NSF budget line items, and columns should show the funds requested from NSF, the funds provided from other sources, and the total for each line item. Reference to these additional funds is for informational purposes only, and they will not be subject to audit.

6. **OTHER FASTLANE or GRANTS.GOV FORMS**

Biographical Sketches: Sketches must be provided for the PI, co-PIs, and other senior project personnel. These sketches need not follow a prescribed format, but must be limited to two pages.

Current and Pending Support: Required for the PI, co-PIs, and senior project personnel. The proposal being submitted should be listed first on the form and identified as *pending*.

Facilities, Equipment & Other Resources: Not required for ISE proposals.

7. **SUPPLEMENTARY DOCUMENTS**

The Project Description must provide sufficient information for reviewers to make reasoned judgments about the proposed work. It may be necessary to provide a limited amount of additional supporting information, as noted in the section on project deliverables. Because reviewers may be asked to assess a substantial number of competing proposals, PIs must be **extremely judicious** in the number of pages submitted. *PIs should submit executive summaries and illustrative samples of materials rather than complete reports or lengthy publications.* Biographical sketches of advisors should be limited to no more than a single page for each.

All Supplementary Documents must be submitted through FastLane or Grants.gov.. Only media that cannot be submitted in this form may be provided as DVD or CD; 15 copies (5 for Planning Grants), labeled with proposal number, title, and PI, must be sent to: Informal Science Education Program, EHR/ESIE, Room 885, National Science Foundation, 4201 Wilson Boulevard, Arlington, VA 22230 [phone: (703) 292-5087]. These materials, which will not be returned, must be received within 5 business days following electronic submission; clearly mark the package *re*: Supplementary Documents and indicate the proposal number.

Planning Grant Proposal Instructions:

Planning Grants follow the general format described in the section above for Full Proposals. The information provided here is a summary of that format applied specifically to the preparation of Planning Grant proposals.

1. **PROJECT SUMMARY**: Same as Full Proposal Instructions.

2. **PROJECT DESCRIPTION:** Planning grant proposal narratives should generally be limited to ten single-spaced pages and may not exceed 15. The narrative includes the following required elements, which are similar to those for a full proposal. See Section V.A.1-3 for additional details.

Impact (audience, intended public or professional impact; and means for evaluating impact; strategic impact;). This section should identify the intended impacts of the project that will ultimately result from the planning activity, as well as any impacts of the planning activity itself.

Innovation (including main project deliverables; primary STEM content; the project plan; and how this project builds on research and prior work). Although this section should focus on the specific planning activities being proposed, it should also address innovations in the ultimate project.

Collaboration (primary individuals and organizational partners and how they will achieve the larger impacts of the project). This section should addressed both the planning activity and the ultimate project.

3. **BUDGET**: Same as Full Proposal Instructions.

4. **SUPPLEMENTARY DOCUMENTS**: Include a statement of commitment from each partner that indicates willingness to participate in the planning process.

Proposers are reminded to identify the program announcement/solicitation number (06-520) in the program announcement/ solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost Sharing:

Cost sharing is not required by NSF in proposals submitted under this Program Solicitation.

Other Budgetary Limitations:

Funding for the following are **not** supported by this program: capital expenses; operating expenses (other than through an indirect cost rate); purchase of major or office equipment; vehicles; graduate or undergraduate tuition; paid advertising; and admissions or similar fees.

C. Due Dates

Proposals must be submitted by the following date(s):

Preliminary Proposals *(required):*

March 21, 2006
for Project Grants

September 14, 2006
for Project Grants

Second Thursday in March
thereafter

Second Thursday in September
thereafter

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

June 22, 2006
for Project Grants

December 14, 2006
for Project Grants

Third Thursday in June
thereafter

Second Thursday in December
thereafter

Planning Grants: Proposals must be submitted on the same deadline dates as those indicated above for Preliminary Proposals, following discussion with a Program Officer.

Conference, Symposia, and Workshop Grants: Proposals may be submitted at any time, *generally at least one year in advance,* following discussion with a Program Officer. This category does not require Preliminary Proposals.

Grant Supplements (for existing ISE Awards): Requests must be submitted *at least two months* prior to the need for additional funds, following discussion with the Cognizant Program Officer.

D. FastLane / Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

  Detailed technical instructions for proposal 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 solicitation.

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. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. Further instructions regarding this process are available on the FastLane Website at: http://www.fastlane.nsf.gov/.

- **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. The Grants.gov's Grant Community User Guide is a comprehensive reference document that provides technical information about Grants.gov. Proposers can download the User Guide as a Microsoft Word document or as a PDF document. The Grants.gov User Guide is available at: http://www.grants.gov/CustomerSupport. 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. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest, at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

The National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 (NSB 97-72). All NSF proposals are evaluated through use of the two merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

On July 8, 2002, the NSF Director issued Important Notice 127, Implementation of new Grant Proposal Guide Requirements Related to the Broader Impacts Criterion. This Important Notice reinforces the importance of addressing both criteria in the preparation and review of all proposals submitted to NSF. NSF continues to strengthen its internal processes to ensure that both of the merit review criteria are addressed when making funding decisions.

In an effort to increase compliance with these requirements, the January 2002 issuance of the GPG incorporated revised proposal preparation guidelines relating to the development of the Project Summary and Project Description. Chapter II of the GPG specifies that Principal Investigators (PIs) must address both merit review criteria in separate statements within the one-page Project Summary. This chapter also reiterates that broader impacts resulting from the proposed project must be addressed in the Project Description and described as an integral part of the narrative.

Effective October 1, 2002, NSF will return without review proposals that do not separately address both merit review criteria within the Project Summary. It is believed that these changes to NSF proposal preparation and processing guidelines will more clearly articulate the importance of broader impacts to NSF-funded projects.

The two National Science Board approved merit review criteria are listed below (see the Grant Proposal Guide Chapter III.A for further information). 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 he/she 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 and original 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?

NSF staff 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.

Additional Review Criteria:

ISE reviewers will consider the following as specific aspects of Intellectual Merit and Broader Impacts.

Within Intellectual Merit, reviewers will assess:

Deliverables. Does this project creatively "push the envelope" in enhancing informal science learning? Have the deliverables been selected and integrated to achieve the greatest project impacts? Are front-end and formative evaluation efforts adequate for their development? Are their scope and depth of STEM content appropriate to the target audience? (Innovation)

Project Design. Are the deliverables, project design, and timeline well developed and integrated to produce the specified impacts? Does the project design build on informal learning research and on lessons learned from prior efforts? Is the proposed budget reasonable and adequate? Does the proposal present meaningful strategies for managing potential risks? (Innovation)

Project Team. Is the team qualified to carry out the project? Do external advisors provide the expertise necessary to conduct the project, including relevant expertise based in informal science learning, STEM content, any media used, and evaluation? (Collaboration).

Partnerships. Does the project fully take advantage of partnerships to enhance project impacts? Is there a credible strategy and plan for fostering or strengthening collaboration among the partners? (Collaboration)

Within Broader Impacts, reviewers will assess:

Audience. Is the primary target audience, as well as any secondary audience, clearly identified and segmented into

subgroups as appropriate? Does the project demonstrate knowledge about the target audiences, their needs, and their interests? (Impact)

Public Audiences. Will the project likely achieve a significant impact on the target audience of informal learners? Does the project maximize reach to audiences nationally, regionally, or community-wide? Does the proposal offer effective ways to reach nontraditional audiences and underrepresented groups? (Impact)

---or---*Professional Audiences.* Will the project likely achieve a significant impact on professionals in the field of informal science learning? (Impact)

Impact Evaluation. Are there clear, appropriate measures and criteria for defining project success? Is there an appropriate summative evaluation plan for assessing impact? Is there an effective plan for broadly sharing project outcomes and findings? (Impact)

Strategic Impact. Is the project likely to advance the field of informal science education in a significant way? (Impact)

B. Review Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by 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.

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 Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

NSF is striving to be able to tell proposers whether their proposals have been declined or recommended for funding within six months. The time interval begins on the closing date of an announcement/solicitation, or the date of proposal receipt, whichever is later. The interval ends when the Division Director accepts the Program Officer's recommendation.

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 Division 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.A. 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 (NSF-GC-1); * or Federal Demonstration Partnership (FDP) Terms and Conditions * and (5) any announcement or other NSF issuance that

may be incorporated by reference in the award letter. Cooperative agreement awards are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

Consistent with the requirements of OMB Circular A-16, *Coordination of Geographic Information and Related Spatial Data Activities*, and the Federal Geographic Data Committee, all NSF awards that result in relevant geospatial data must be submitted to Geospatial One-Stop in accordance with the guidelines provided at: www.geodata.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpm. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Website at http://www.gpo.gov/.

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

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

PIs are required to submit the Summative Evaluation of the project for posting to the web site www.informalscience.org (or other sites designated by ISE) as part of submission of the Final Report and may be requested to provide project data for ISE program analysis and evaluation.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for the PI and all Co-PIs. 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. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, 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.

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding this program should be made to:

- Alphonse T. Desena, Program Director [exhibit projects], Directorate for Education & Human Resources, Division of Elementary, Secondary, & Informal Education, 885 S, telephone: (703) 292-5106, fax: (703) 292-9044, email: adesena@nsf.gov
- Arlene M. de Strulle, Program Director [technology projects], Directorate for Education & Human Resources, Division of Elementary, Secondary, & Informal Education, 885 S, telephone: (703) 292-5117, fax: (703) 292-9044, email: adestrul@nsf.gov
- Sylvia M. James, Program Director [youth & community programs], Directorate for Education & Human Resources, Division of Elementary, Secondary, & Informal Education, 885 S, telephone: (703) 292-5333, fax: (703) 292-9044, email: sjames@nsf.gov
- Valentine H. Kass, Program Director [media projects], Directorate for Education & Human Resources, Division of Elementary, Secondary, & Informal Education, 885 S, telephone: (703) 292-5095, fax: (703) 292-9044, email: vkass@nsf.gov
- Mary Ann Steiner, Program Director [youth & community programs], Directorate for Education & Human Resources, Division of Elementary, Secondary, & Informal Education, 885 S, telephone: (703) 292-5128, fax: (703) 292-9044, email: msteiner@nsf.gov
- David A. Ucko, Section Head, Informal Science Education, Directorate for Education & Human Resources, Division of Elementary, Secondary, & Informal Education, 885 S, telephone: (703) 292-5126, fax: (703) 292-9044, email:

ducko@nsf.gov

- Sandra H. Welch, Program Director [media projects], Directorate for Education & Human Resources, Division of Elementary, Secondary, & Informal Education, 885 S, telephone: (703) 292-5094, email: swelch@nsf.gov

For administrative questions contact:

- Phyliss Minn, Senior Program Assistant, pminn@nsf.gov or (703) 292-5087.

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.

For questions related to the use of FastLane, contact:

- ESIE FastLane Contact, telephone: (703) 292-8620, email: ehr-esie.info@nsf.gov

IX. OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at http://www.nsf.gov/cgi-bin/getpub?gp. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF E-Bulletin, which is updated daily on the NSF Website at http://www.nsf.gov/home/ebulletin, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's MyNSF News Service (http://www.nsf.gov/mynsf/) to be notified of new funding opportunities that become available.

Related Programs:

- Information Technology Experiences for Students and Teachers (NSF 05-621)

The National Science Foundation (NSF) and the National Endowment for the Humanities (NEH) have agreed to encourage TV film projects that meet both the NSF criteria for science content and the NEH criteria for humanities content. Applicants who would like their media projects considered for co-review and possible co-funding by the Public Programs Division of the National Endowment for the Humanities should so indicate in the project description. For relevant NEH guidelines, see:

- Radio Project Development and Production: http://www.neh.gov/grants/guidelines/radiodev.html
- Television Project Planning, Scripting, or Production: http://www.neh.gov/grants/guidelines/tvprojects.html.

In addition to investing in informal science education, the comprehensive programming of the NSF Division of Elementary, Secondary, and Informal Education (ESIE) develops research-based models and high-quality, innovative resources designed to strategically impact the learning and teaching of science, technology, engineering, and mathematics (STEM) education, grades preK-12. Instructional materials and student assessments that promote active investigation, together with new models for teacher education, contribute to STEM classroom environments that serve all students well. These programs create a solid educational foundation in STEM disciplines for the future research, instructional, and technological workforce, as well as for students pursuing post-secondary education in other disciplines. All ESIE efforts incorporate innovations that promote high standards in content, pedagogy, and assessment; and through collaborations, capitalize on the strengths of formal and informal education, research and practitioner communities, and major stakeholders (e.g., higher education, school districts, state education agencies). Other programs administered by ESIE include: Information Technology Experiences for Students

and Teachers (ITEST); Teacher Professional Continuum (TPC); Instructional Materials Development (IMD); Centers for Learning and Teaching (CLT); Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST); and Advanced Technological Education (ATE). Further information on these programs can be found at http://www.nsf.gov/div/index.jsp?div=ESIE.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Awardees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities and persons with disabilities to compete fully in its programs. In accordance with Federal statutes, regulations and NSF policies, no person on grounds of race, color, age, sex, national origin or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF, although some programs may have special requirements that limit eligibility.

Facilitation Awards for Scientists and Engineers with Disabilities (FASED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the GPG Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

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: pubs@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; 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 applicant 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 needing information as part of the review process or in order to coordinate programs; 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," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). 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 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 this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Division of Administrative Services, National Science Foundation, Arlington, VA 22230.

OMB control number: 3145-0058.

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