

# NSF Science, Engineering and Education for Sustainability Fellows

NSF SEES Fellows

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## PROGRAM SOLICITATION

NSF 12-601

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REPLACES DOCUMENT(S):

NSF 11-575

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### National Science Foundation

Directorate for Biological Sciences

Directorate for Computer & Information Science & Engineering

Directorate for Engineering

Directorate for Geosciences

Directorate for Education & Human Resources

Directorate for Mathematical & Physical Sciences

Directorate for Social, Behavioral & Economic Sciences

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

November 26, 2012

November 21, 2013

Third Thursday in November, Annually Thereafter

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## IMPORTANT INFORMATION AND REVISION NOTES

PI Eligibility Criteria have been changed from previous version of the solicitation.

**Previously** (NSF 11-575), to be eligible, a prospective PI must have received his or her doctoral degree no more than four years prior to the application deadline. The revised solicitation **now** requires that the prospective PI must not have worked for more than 36 months in position(s) which required the doctoral degree. In addition, the revised solicitation **now** requires that prospective PIs **cannot** be employed in a tenure-track (or equivalent) position. (See Section IV, PI Limit and Section V.A for specific instructions.)

The Project Summary and Project Description **must** explicitly address solicitation-specific requirements. (See Section V.A.)

Letters of Collaboration from PI's Host Mentor and Partner Mentor **must** be included with application. (See Section V.A.)

PIs are encouraged to read the revised solicitation carefully and follow all instructions.

### Important Reminders

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

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

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

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## SUMMARY OF PROGRAM REQUIREMENTS

## General Information

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### Program Title:

NSF Science, Engineering and Education for Sustainability Fellows  
NSF SEES Fellows

### Synopsis of Program:

Through the SEES Fellows Program, NSF seeks to advance science, engineering, and education to inform the societal actions needed for environmental and economic sustainability and human well-being while creating the necessary workforce to address these challenges. The Program's emphasis is to facilitate investigations that cross traditional disciplinary boundaries and address issues of sustainability through a systems approach, building bridges between academic inquiry, economic growth, and societal needs. The Fellow's proposed investigation must be interdisciplinary and allow him/her to obtain research experiences beyond his/her current core disciplinary expertise. Fellows are required to develop a research partnership(s) that will advance and broaden the impact/scope of the proposed research, and present a plan for their own professional development in the area of sustainability science and engineering.

### Cognizant Program Officer(s):

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

- Charles D. Pibel, Directorate for Mathematical and Physical Sciences, telephone: (703) 292-4971, email: [cpibel@nsf.gov](mailto:cpibel@nsf.gov)
- Larry Weber, Directorate for Geosciences, telephone: (703) 292-7240, email: [lweber@nsf.gov](mailto:lweber@nsf.gov)
- Fahmida N. Chowdhury, Directorate for Social, Behavioral and Economic Sciences, telephone: (703) 292-4672, email: [fchowdhu@nsf.gov](mailto:fchowdhu@nsf.gov)
- Paul "Wyn" Jennings, Directorate for Education and Human Resources, telephone: (703) 292-5307, email: [pjennin@nsf.gov](mailto:pjennin@nsf.gov)
- Carole Read, Directorate for Engineering, telephone: (703) 292-2418, email: [cread@nsf.gov](mailto:cread@nsf.gov)
- John H. Reppy, Directorate for Computer & Information Science, telephone: (703) 292-7849, email: [jreppy@nsf.gov](mailto:jreppy@nsf.gov)
- Samuel M. Scheiner, Directorate for Biological Sciences, telephone: (703) 292-7175, email: [sscheine@nsf.gov](mailto:sscheine@nsf.gov)
- John E. Snyder, Office of International Science and Engineering, telephone: (703) 292-8572, email: [jesnyder@nsf.gov](mailto:jesnyder@nsf.gov)

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

- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences
- 47.050 --- Geosciences
- 47.070 --- Computer and Information Science and Engineering
- 47.074 --- Biological Sciences
- 47.075 --- Social Behavioral and Economic Sciences
- 47.076 --- Education and Human Resources
- 47.078 --- Office of Polar Programs
- 47.079 --- Office of International Science and Engineering
- 47.080 --- Office of Cyberinfrastructure
- 47.081 --- Office of Experimental Program to Stimulate Competitive Research

## Award Information

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**Anticipated Type of Award:** Standard Grant

**Estimated Number of Awards:** 15 to 20

**Anticipated Funding Amount:** \$7,000,000, pending availability of funds.

## Eligibility Information

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### Organization Limit:

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.
- Proposals may also be submitted by individuals who are unaffiliated or who are affiliated with for-profit organizations, state or local governments or federal agencies. When applying as independent/unaffiliated individuals, Fellow applicants must register with FastLane prior to submitting their proposals and, if recommended for an award, must affiliate with a U.S. university, college, or non-profit, non-academic organization, which will administer the award.

### PI Limit:

The Principal Investigator (PI) on the NSF SEES Fellows proposal must be the prospective Fellow. No co-PIs are allowed.

To be eligible to submit a proposal to the NSF SEES Fellows program, an individual must, as of the proposal deadline date, meet all of the following criteria:

- Be a U.S. citizen, national, or permanent resident;
- Have earned the doctoral degree, or expect to have earned the doctoral degree, by the start date of the award;
- Not have worked for more than 36 full-time equivalent months in one or more positions that require the doctoral degree. If more than 36 months have elapsed between conferral of the doctoral degree and the SEES Fellows proposal deadline date, PIs must include specific language in their Biographical Sketch (discussed below) affirming that they meet this eligibility requirement.
- Not be employed in a tenure-track (or tenure-track-equivalent) position at an academic institution or at a non-profit, non-degree-granting organization such as a museum, observatory, or research lab.

**Limit on Number of Proposals per Organization:**

None Specified

**Limit on Number of Proposals per PI:** 1

## Proposal Preparation and Submission Instructions

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### A. Proposal Preparation Instructions

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

### B. Budgetary Information

- **Cost Sharing Requirements:** Inclusion of voluntary committed cost sharing is prohibited.
- **Indirect Cost (F&A) Limitations:** Not Applicable
- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

### C. Due Dates

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):
  - November 26, 2012
  - November 21, 2013
  - Third Thursday in November, Annually Thereafter

## Proposal Review Information Criteria

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

## Award Administration Information

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

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

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## I. INTRODUCTION

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A sustainable world is one in which human needs are met equitably without harm to the environment, and without sacrificing the ability of future generations to meet their needs. Meeting this formidable challenge requires a substantial increase in our understanding of the integrated system of society, the natural world, and the alterations humans bring to Earth. NSF's Science, Engineering, and Education for Sustainability (SEES) activities aim to address this need through support for interdisciplinary research and education.

Fundamental to all sustainability research is the simultaneous consideration of social, economic, and environmental systems and the long-term viability of those systems. Concepts that underlie the science of sustainability include complex adaptive systems theory, emergent behavior, multi-scale processes, as well as the vulnerability, adaptive capacity, and resilience of coupled human-environment systems. An important research goal is to understand how patterns and processes at the local and regional scales are shaped by and feed into processes and patterns that manifest at the global scale over the long term. These topics guide research to explore alternate ways of managing the environment, migrating from finite resources to renewable or inexhaustible resources, and applying technology to improve human well-being. Conceptual frameworks for sustainability, including general theories and models, are critically needed for such informed decision-making.

SEES activities span the entire range of scientific domains at NSF and aim to: 1) support interdisciplinary research and education that can facilitate the move towards global sustainability; 2) build linkages among existing projects and partners and add new participants in the sustainability research enterprise; and 3) develop a workforce trained in the interdisciplinary scholarship needed to understand and address the complex issues of sustainability. The SEES Fellows program addresses all three of these SEES aims.

## II. PROGRAM DESCRIPTION

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There is a critical need to develop the workforce in the area of sustainability science and engineering. Through SEES Fellows, NSF seeks to advance science, engineering, and education to inform the societal actions needed for environmental and economic sustainability and sustainable human well-being while creating the necessary workforce to address these challenges. The program's emphasis is to facilitate investigations that cross traditional disciplinary boundaries and address issues of sustainability through a systems approach, building bridges between academic inquiry, economic growth, and societal needs. The Fellow's proposed investigation must be interdisciplinary and allow him/her to obtain research experience beyond his/her current core disciplinary expertise.

A goal of the SEES Fellows Program is to support research that would not fit neatly into a single NSF disciplinary research program.

Fellows are required to develop a partnership(s) that will advance and broaden the impact/scope of the proposed research. Partners may include, but are not limited to, a NSF Research Coordination Network (RCN), center or facility; industry; National Laboratory; state, regional, or local resource management agency; Non-Government Organization (NGO); foreign institution; or international organization.

Fellows are required to have two mentors, one for the proposed research at the host institution (the institution that will administer the award) and the other for the partnership. The host mentor and partner mentor must be from different institutions, and must provide different disciplinary expertise.

Fellows must also present a plan for their own professional development in the area of sustainability science and engineering. Activities may include, but are not limited to, obtaining training in a new discipline, gaining expertise on new methods/tools, serving in a leadership role in a professional society or industry group, mentoring students, undertaking efforts to broaden participation of under-represented groups in sustainability science, developing an education activity, developing a professional network or working on a project that focuses on public engagement.

Fellows may include a plan for leading and teaching a course at the undergraduate or graduate level that ideally relates directly to their proposed sustainability science or engineering research, partnerships, or professional development activities. If proposed, the institution where the teaching would take place must cover the Fellow's salary plus fringe benefit costs for time committed to the course. The teaching is limited to no more than one course per term, and no more than three courses throughout the period of the SEES Fellows award. This restriction is meant to provide the Fellow adequate time to engage in research collaborations and other professional development, and the teaching experience would be in addition to other professional development activities described in the proposal.

The challenge of sustainability is of global concern, and international partnerships are encouraged. As with all partnerships, these should represent true intellectual collaborations that are mutually beneficial, and leverage the expertise, specialized skills, facilities, and/or resources of all partners. While the formal host institution for the SEES Fellow must be in the United States (for award administration requirements), Fellows may spend extended periods at other locations, including international sites, as called for by the research, partnerships, and professional development plans. Fellows are responsible for obtaining any required visas for foreign travel, research permits, and import/export documents. Please review NSF's web page "Information for U.S. Travelers" at <http://www.nsf.gov/od/aise/for-travelers-main.jsp>.

Fellows must propose a well-integrated, synergistic research plan with their chosen host institution, an effective research partnership(s), and a meaningful professional-development plan. Overall, the proposal should reflect the Fellow's own research interests and professional goals presented in relationship to overall impact on science, engineering and education for sustainability. Because there may be different expectations within different disciplinary fields and/or different partnering organizations, a wide range of research and professional activities may be appropriate for the NSF SEES Fellows program. More information about NSF's SEES investment area can be found on the SEES webpage at: <http://www.nsf.gov/sees/>.

NSF enables career-life balance through a variety of mechanisms. Support to address dependent care issues may be available for awardees. For more information, please see <http://www.nsf.gov/career-life-balance/>.

### III. AWARD INFORMATION

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**Anticipated Type of Award:** Standard Grant

**Estimated Number of Awards:** 15 to 20

**Anticipated Funding Amount:** \$7,000,000, pending availability of funds

### IV. ELIGIBILITY INFORMATION

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#### Organization Limit:

Proposals may only be submitted by the following:

- Universities and Colleges - Universities and two- and four-year colleges (including community colleges) accredited in, and having a campus located in the US, acting on behalf of their faculty members. Such organizations also are referred to as academic institutions.
- Non-profit, non-academic organizations: Independent museums, observatories, research labs, professional societies and similar organizations in the U.S. associated with educational or research activities.
- Proposals may also be submitted by individuals who are unaffiliated or who are affiliated with for-profit organizations, state or local governments or federal agencies. When applying as independent/unaffiliated individuals, Fellow applicants must register with FastLane prior to submitting their proposals and, if recommended for an award, must affiliate with a U.S. university, college, or non-profit, non-academic organization, which will administer the award.

#### PI Limit:

The Principal Investigator (PI) on the NSF SEES Fellows proposal must be the prospective Fellow. No co-PIs are allowed.

To be eligible to submit a proposal to the NSF SEES Fellows program, an individual must, as of the proposal deadline date, meet all of the following criteria:

- Be a U.S. citizen, national, or permanent resident;
- Have earned the doctoral degree, or expect to have earned the doctoral degree, by the start date of the award;
- Not have worked for more than 36 full-time equivalent months in one or more positions that require the doctoral degree. If more than 36 months have elapsed between conferral of the doctoral degree and the SEES Fellows proposal deadline date, PIs must include specific language in their Biographical Sketch (discussed below) affirming that they meet this eligibility requirement.
- Not be employed in a tenure-track (or tenure-track-equivalent) position at an academic institution or at a non-profit, non-degree-granting organization such as a museum, observatory, or research lab.

#### Limit on Number of Proposals per Organization:

None Specified

#### Limit on Number of Proposals per PI: 1

### V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

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#### A. Proposal Preparation Instructions

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

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

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

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

Requirements listed in the NSF Grant Proposal Guide or NSF Grants.gov Application Guide must be strictly adhered to. **SEES Fellows proposals must also adhere to the following additional guidelines:**

1. Cover Sheet. The title of the proposed project must start with "SEES Fellows:" followed by a short, descriptive title of the research. If the project will involve international partners, check the "International Cooperative Activities" box and identify the country/countries involved.
2. Project Summary. In addition to describing the intellectual merit and broader impacts of the proposed activity, the Project Summary must: 1) identify the host and partner mentors and their organizations, 2) explicitly address the relevance of the proposed research to sustainability and the goal of the SEES Fellows Program to support interdisciplinary research, and 3) highlight the Fellow's proposed professional development activities.
3. Project Description. As noted in the Program Description section above, a competitive SEES Fellows proposal will include well developed plans for research, partnerships, and the Fellow's own professional development. The Project Description must address all three aspects. The Project Description must also explicitly address the relevance of the proposed research to sustainability and the goal of the SEES Fellows Program to support interdisciplinary research.
4. Biographical Sketch. The Biographical Sketch must include identification of U.S. citizenship or permanent resident status, and the month and year when PhD was (or is expected to be) received. If more than 36 months have elapsed between the date that the doctoral degree was conferred and the application deadline for the SEES Fellows solicitation, the Biographical Sketch must include the following statement: "**I affirm that I have not worked for more than 36 full-time equivalent months in positions for which the doctoral degree was a requirement.**" Do not include personal information such as birth date or place of birth. **Only** the Fellow's Biographical Sketch should be uploaded in this section. Biographical Sketches for the host mentor and partner mentor must be included in the Supplementary Documentation section, together with their letters of collaboration.
5. Budget Pages. The proposed SEES Fellow is listed as PI. For allowable budget items, see the Other Budgetary Limitations section below.
6. Current and Pending Support. Under pending support, include this proposal, as well as pending and planned applications to other fellowship or research programs.

#### **Supplementary Documentation**

7. Postdoctoral Researcher Mentoring Plan. Because the potential SEES Fellow is the PI on the proposal, this does not apply, and nothing should be uploaded to this module.
8. Data Management Plan. Required, as noted in the Important Information and Revision Notes section.
9. Letter of Collaboration from Host Mentor. (Maximum 2 pages for letter; 2 pages for NSF format biographical sketch). The host mentor must confirm support of the Fellow's plan for research at their institution as well as agreement with the proposed partnership(s). The host mentor must include a description of the mentoring activities that will be provided for the Fellow, such as career counseling, training in preparing grant applications, guidance on ways to improve teaching skills, and training in research ethics. The host mentor's 2-page Biographical Sketch (conforming to NSF Grant Proposal Guide or NSF Grants.gov Application Guide requirements) must be appended to their letter of collaboration.
10. Letter of Collaboration from Partner Mentor. (Maximum 2 pages for letter; 2 pages for NSF format biographical sketch). The partner mentor must outline the nature of the collaboration and explain how the partnership(s) will advance and broaden the impact/scope of the proposed research. The letter must also include a description of the mentoring activities that will be provided for the Fellow. The partner mentor's 2-page Biographical Sketch (conforming to NSF Grant Proposal Guide or NSF Grants.gov Application Guide requirements) must be appended to their letter of collaboration.
11. Additional Letters of Collaboration. Letters of collaboration (up to one page each) are allowed to document agreement with other collaborators discussed in the proposal. These letters should focus on how the collaboration will advance and broaden the impact/scope of the proposed research.

## **B. Budgetary Information**

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

#### Other Budgetary Limitations:

- Salary plus fringe benefits for the Fellow may be up to a maximum of \$264,000, based on 36 months full-time equivalent effort. Amounts for the Fellow's salary plus fringe benefits may be less than the stated maximum, based on institutional policies and pay scales.
- Up to a maximum of \$60,000 (for 36 months full-time equivalent effort) may be requested for expenses directly related to the proposed research, partnerships and professional development, including but not limited to salary and fringe benefits for student research assistants, equipment, domestic and foreign travel, materials and supplies, computing resources, access to data, and publication charges. Included in this amount, the Fellow must budget for trips to NSF for PI meetings in the second and third year of their award.
- Fellows proposing international partnerships may request up to an additional \$30,000 (for 36 months full-time equivalent effort) for international travel, subsistence, and other expenses required for the research, partnerships and professional development activities. These costs should be clearly explained in the budget justification, including number of trips and duration of stays. Please refer to the GPG ([http://www.nsf.gov/pubs/policydocs/pappguide/nsf11001/gpg\\_2.jsp#IIC2givc](http://www.nsf.gov/pubs/policydocs/pappguide/nsf11001/gpg_2.jsp#IIC2givc)) for guidelines on international travel.
- No other direct cost budget items are allowed.
- For Fellows proposing projects requiring less than 36 months full-time equivalent effort, salary plus fringe benefits, together with other expenses, must be prorated accordingly.
- To allow for limited teaching time or other activities not paid for by the award, the proposed duration of the SEES Fellows project can be for a maximum of 48 months, with up to 36 months of NSF funding for the Fellow's salary and other expenses.
- Funding for SEES Fellows is provided as an NSF standard grant, and awards are subject to standard indirect cost policies and rates.

#### C. Due Dates

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

November 26, 2012

November 21, 2013

Third Thursday in November, Annually Thereafter

#### D. FastLane/Grants.gov Requirements

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- **For Proposals Submitted Via FastLane:**

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

**Submission of Electronically Signed Cover Sheets.** The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane Website at: <https://www.fastlane.nsf.gov/fastlane.jsp>.

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

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

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

## VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

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Proposals received by NSF are assigned to the appropriate NSF program where they will be reviewed if they meet NSF proposal preparation requirements. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with the oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with

the proposal.

## A. NSF Merit Review Criteria

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

The two NSB-approved merit review criteria are listed below. The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which the reviewer is qualified to make judgments.

### **What is the intellectual merit of the proposed activity?**

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

### **What are the broader impacts of the proposed activity?**

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

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

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

### **Additional Solicitation Specific Review Criteria**

#### **SEES**

- Will the proposed activities advance the foundations of sustainability science and engineering by including a strong conceptual framework?
- Will the proposed activities integrate across NSF-supported disciplines and will the applicant expand beyond his or her current core disciplinary expertise?

#### **Hosts and Partnerships:**

- Are the proposed host mentor and partner mentor effective and committed to enable the Fellow to be successful? Do the host and partner's organizations have the infrastructure to enable the Fellow to be successful?
- Will the proposed partnerships advance and broaden the impact/scope of the proposed research activities?
- Are the partnerships based on mutual benefits and will they leverage the expertise, specialized skills, facilities, and/or resources of all partners?

#### **Professional Development:**

- Will the proposed professional development activities enhance the Fellow's career growth while complementing the proposed interdisciplinary research and partnerships?

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

#### ***Integration of Research and Education***

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

#### ***Integrating Diversity into NSF Programs, Projects, and Activities***

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

## B. Review and Selection Process

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

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

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



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

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

## VII. AWARD ADMINISTRATION INFORMATION

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### A. Notification of the Award

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

### B. Award Conditions

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

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

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

#### Special Award Conditions:

NSF SEES-Fellow applicants will be notified if they will be offered an award. The applicant must accept the award (via email to the cognizant Program Officer) or withdraw their application within 30 days of notification. The exact start date of the award will be determined by NSF after discussion between the cognizant Program Officer and the PI.

Unaffiliated applicants must affiliate with a host organization in order to receive the award. A Fellow's Award will not be finalized until a host organization provides to NSF a revised cover sheet and budget for the proposed activity signed by an authorized organizational representative. Guidance regarding this process will be provided by the NSF Program Officer.

Awards are made to the organization on behalf of the Fellow. If the Fellow chooses to affiliate with another organization during the grant and receives approval from the NSF Program Officer, the current awardee organization must allow the award to be transferred.

Fellows who are granted family or medical leave by the grantee institution may request supplemental support. Please see <http://www.nsf.gov/career-life-balance/> for additional information on NSF's career-life balance initiative, and contact your Program Director.

### C. Reporting Requirements

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

Failure to provide the required annual or final project reports, or the project outcomes report will delay NSF review and processing of any future funding increments as well as any pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through FastLane, for preparation and submission of annual and final project reports. Such reports provide information on activities and findings, project participants (individual and organizational), publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system. Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

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

## VIII. AGENCY CONTACTS

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

General inquiries regarding this program should be made to:

- Charles D. Pibel, Directorate for Mathematical and Physical Sciences, telephone: (703) 292-4971, email: [cpibel@nsf.gov](mailto:cpibel@nsf.gov)
- Larry Weber, Directorate for Geosciences, telephone: (703) 292-7240, email: [lweber@nsf.gov](mailto:lweber@nsf.gov)
- Fahmida N. Chowdhury, Directorate for Social, Behavioral and Economic Sciences, telephone: (703) 292-4672, email: [fchowdhu@nsf.gov](mailto:fchowdhu@nsf.gov)
- Paul "Wyn" Jennings, Directorate for Education and Human Resources, telephone: (703) 292-5307, email: [pjennin@nsf.gov](mailto:pjennin@nsf.gov)
- Carole Read, Directorate for Engineering, telephone: (703) 292-2418, email: [cread@nsf.gov](mailto:cread@nsf.gov)
- John H. Reppy, Directorate for Computer & Information Science, telephone: (703) 292-7849, email: [jreppy@nsf.gov](mailto:jreppy@nsf.gov)
- Samuel M. Scheiner, Directorate for Biological Sciences, telephone: (703) 292-7175, email: [sscheine@nsf.gov](mailto:sscheine@nsf.gov)
- John E. Snyder, Office of International Science and Engineering, telephone: (703) 292-8572, email: [jesnyder@nsf.gov](mailto:jesnyder@nsf.gov)

For questions related to the use of FastLane, contact:

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

For questions relating to Grants.gov contact:

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

General inquiries regarding this program should be made to [seesfellows@nsf.gov](mailto:seesfellows@nsf.gov)

## IX. OTHER INFORMATION

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

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

## ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

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

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS)

capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

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

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

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

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

## PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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

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

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

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