Expeditions in Computing

National Science Foundation

Directorate for Computer & Information Science & Engineering
    Division of Computing and Communication Foundations
    Division of Information & Intelligent Systems
    Division of Computer and Network Systems

Preliminary Proposal Due Date(s) *(required)* (due by 5 p.m. proposer's local time)**:**

> September 10, 2008

> September 10, Annually Thereafter

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

> February 10, 2009

> February 10, Annually Thereafter

REVISION NOTES

The following changes have been made:

- The Expeditions in Computing program no longer requests the submission of Letters of Intent.
- The preliminary proposal and full proposal deadlines dates have changed.
- Preliminary proposal and full proposal preparation instructions have been revised.

Please be advised that the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) includes revised guidelines to implement the mentoring provisions of the America COMPETES Act (ACA) (Pub. L. No. 110-69, Aug. 9, 2007.) As specified in the ACA, each proposal that requests funding to support postdoctoral researchers must include a description of the mentoring activities that will be provided for such individuals. Proposals that do not comply with this requirement will be returned without review (see the PAPP Guide Part I: *Grant Proposal Guide* Chapter II for further information about the implementation of this new requirement).

As announced on May 21, 2009, proposers must prepare and submit proposals to the National Science Foundation (NSF) using the NSF FastLane system at http://www.fastlane.nsf.gov/. This approach is being taken to support efficient Grants.gov operations during this busy workload period and in response to OMB direction guidance issued March 9, 2009. NSF will continue to post information about available funding opportunities to Grants.gov FIND and will continue to collaborate with institutions who have invested in system-to-system submission functionality as their preferred proposal submission method. NSF remains committed to the long-standing goal of streamlined grants processing and plans to provide a web services interface for those institutions that want to use their existing grants management systems to directly submit proposals to NSF.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

> Expeditions in Computing

Synopsis of Program:

> The far-reaching impact and rate of innovation in the computing and information disciplines has been remarkable, generating economic prosperity and enhancing the quality of life for people throughout the world. But the best is yet to come!

> The Directorate for Computer and Information Science and Engineering (CISE) has created the Expeditions in Computing (*Expeditions*) program to provide the CISE research and education community with the opportunity to pursue ambitious, fundamental research agendas that promise to define the future of computing and information. In planning *Expeditions*, investigators are encouraged to come together within or across departments or institutions

to combine their creative talents in the identification of compelling, transformative research agendas that promise disruptive innovations in computing and information for many years to come.

Funded at levels up to $2,000,000 per year for five years, *Expeditions* represent some of the largest single investments currently made by the directorate. Together with the Science and Technology Centers CISE supports, *Expeditions* form the centerpiece of the directorate's award portfolio. With awards funded at levels that promote the formation of research teams, CISE recognizes that concurrent research advances in multiple fields or sub-fields are often necessary to stimulate deep and enduring outcomes.

CISE anticipates hosting an *Expeditions* competition annually, making three awards in each competition that over five years will result in steady-state support for fifteen projects. The awards made in this program will complement projects supported by other CISE programs, which target particular computing or information disciplines or fields.

Cognizant Program Officer(s):

- Mitra Basu, telephone: (703) 292-8910, email: mbasu@nsf.gov

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

- 47.070 --- Computer and Information Science and Engineering

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 3 annually

Anticipated Funding Amount: $30,000,000 total. Estimated program budget is $30,000,000, subject to the availability of funds. Projects with annual budgets up to $2,000,000 for durations of five years will be supported.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- U.S. academic institutions with undergraduate, masters, and doctoral programs in computer and information science and engineering fields may submit proposals as lead or collaborative institutions. Subawardees may include two-and four-year colleges, non-profit non-academic organizations such as independent museums, institutes, observatories, professional societies and similar organizations in the US that are directly associated with education or research activities in the computing and information fields. Other organizations such as national laboratories, for-profit organizations and organizations in other countries may participate in the proposed activities if they have independent sources of support; they will not be supported by NSF.

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI: 1

- An individual may participate in no more than one preliminary or full proposal as PI, co-PI, or senior personnel.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable

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

- **Full Proposal Preparation Instructions:** This solicitation contains information that deviates from the standard NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full text of this solicitation for further information.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required under this solicitation.

- **Indirect Cost (F&A) Limitations:** Not Applicable

- **Other Budgetary Limitations:** Not Applicable

C. Due Dates

- **Preliminary Proposal Due Date(s)** *(required)* (due by 5 p.m. proposer's local time)*:*

September 10, 2008

September 10, Annually Thereafter

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

    February 10, 2009

    February 10, Annually Thereafter

Proposal Review Information Criteria

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

Award Administration Information

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

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

TABLE OF CONTENTS

I. INTRODUCTION

The computer and information science and engineering community has made significant contributions to society over the past fifty years, generating research and education outcomes that have fueled economic growth, revolutionized healthcare, improved national security, and resulted in products and services that have transformed the everyday lives of people world-wide.

However, the best is yet to come! The Expeditions in Computing (*Expeditions*) program has been created to tap the great reservoir of opportunities that fundamental research advances in computing and information promise for the future. The program is underconstrained by design, to inspire the research and education community to be as creative and imaginative as possible in the design of bold *Expeditions* that explore new scientific frontiers. Investigators in the computer and information science and engineering fields and beyond are encouraged to come together within and/or across departments or institutions in the development of compelling, transformational research agendas that promise disruptive innovations in computing and information for many years to come.

II. PROGRAM DESCRIPTION

The *Expeditions* program has three goals:

- To catalyze far-reaching research explorations motivated by deep scientific questions or hard problems in the computing and information fields, and/or by compelling applications that promise significant societal benefits;
- To inspire current and future generations of Americans, especially those from under-represented groups, to pursue rewarding careers in computer and information science and engineering; and
- To stimulate significant research and education outcomes that, through effective knowledge transfer mechanisms, promise scientific, economic and/or other societal benefits.

Projects supported by the *Expeditions* program comprise the following characteristics:

- Foster research climates that nurture creativity and informed risk-taking, and value complementary research and education contributions such that the whole *Expedition* is greater than the sum of its parts;
- Draw upon well-integrated, diverse teams of investigators from one or more disciplines within computer and information science and engineering, as well as investigators from other fields where necessary;
- Stimulate effective knowledge transfer; and
- Demonstrate experimental systems or support shared experimental facilities (including instruments, platforms and/or testbeds), where necessary, to enable discovery and learning.

Expeditions represent some of the largest single investments made by CISE. Together with the Science and Technology Centers the directorate supports, *Expeditions* form the centerpiece of the directorate's award portfolio. CISE anticipates hosting an *Expeditions* competition annually, making three awards in each competition. Over five years, this will result in steady-state support for at least fifteen *Expeditions* that together demonstrate the tremendous potential of computing and information innovations.

III. AWARD INFORMATION

Estimated program budget is $30,000,000, subject to the availability of funds. Three new awards will be made annually, each with total budgets up to $10,000,000 for durations of five years.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- U.S. academic institutions with undergraduate, masters, and doctoral programs in computer and information science and engineering fields may submit proposals as lead or collaborative institutions. Subawardees may include two-and four-year colleges, non-profit non-academic organizations such as independent museums, institutes, observatories, professional societies and similar organizations in the US that are directly associated with education or research activities in the computing and information fields. Other organizations such as national laboratories, for-profit organizations and organizations in other countries may participate in the proposed activities if they have independent sources of support; they will not be supported by NSF.

PI Limit:

None Specified

 Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI: 1

- An individual may participate in no more than one preliminary or full proposal as PI, co-PI, or senior personnel.

Additional Eligibility Info:

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Preliminary Proposals *(required):* Preliminary proposals are required and must be submitted via the NSF FastLane system.

Preliminary Proposal Preparation Instructions: When preparing a preliminary proposal, proposers are advised to review the Program Description, the Proposal Review Information and the preliminary proposal preparation instructions described below. A preliminary proposal will consist only of the following:

1. Cover Sheet. For planning purposes, July 15 should be shown as the start date.

2. Project Summary (1 page). Provide a rationale for the *Expedition*, describing the unique opportunities to be pursued, and indicating the potential impact of the project. The summary should be informative to other persons working in the same or

related fields and, insofar as possible, understandable to a scientifically or technically literate lay reader. Provide a clear description of the proposed *Expedition*, its overarching goals, its distinguishing features and foci. The names of the collaborative institutions involved and the major contribution of each to the project must be included in the description. The *Intellectual Merit* and *Broader Impacts* merit review criteria must be addressed in separate statements (see NSF's Grant Proposal Guide (GPG) for additional instructions).

3. Table of Contents (automatically generated by Fastlane).

4. Project Description. The Project Description must address Sections (4.a) and (4.b) below. Section (4.c) should be addressed, where appropriate. The Project Description is **limited to 10 pages** including tables and illustrations, regardless of the number of research groups or themes. URL's may not be used (see GPG for additional information). The Broader Impacts resulting from the proposed project must be addressed and described as an integral part of the narrative. Results from Prior NSF Support should **not** be included in the Project Description.

> (4.a) Describe the overarching vision and goal(s) of the proposed *Expedition*. Describe the contributing research, education and knowledge transfer themes or components, emphasizing how "the whole" *Expedition* is greater than the sum of the individual theme or component parts. Describe how the project will contribute to realization of the *Expedition* program goals (address all three as described in the *II. Program Description* section of this solicitation) and demonstrate the *Expedition* characteristics (addressing all four as described in the *II. Program Description* section of this solicitation). Provide sufficient detail to allow assessment of the Intellectual Merit and Broader Impacts of the project and the necessity for support at the requested investment level.

> (4.b) Leadership and collaboration. Describe the organizational structure of the *Expedition*, including plans for integrating and managing all organizations and individuals involved in all components of the *Expedition* to ensure the project goals are met. Explain how collaboration across individuals and organizations will be assured. Describe how effective collaboration will lead to enhanced project outcomes.

> (4.c) Experimental systems or shared experimental facilities (where appropriate). Describe the experimental system to be demonstrated and/or shared experimental facilities (e.g., instruments, platforms, and testbeds) to be used or established and describe how these activities add value to the project.

5. Budget (see NSF GPG). Provide a one-page budget summary for the full five year period. This should be entered in Budget Year 1 in FastLane. (Fastlane will automatically generate a cumulative budget that is identical to the full five-year budget you entered in Year 1.) The proposed budget should be consistent with the needs and complexity of the proposed activity. The budget justification should provide some information for each year of the full five-year period, showing how funds will be allocated to the project components during the start-up phase, and shared facilities that will be required (where necessary).

6. References Cited (two-page limit). Use the instructions from the NSF GPG when observing the two-page limit.

7. Biographical Sketches (two-page limit per person). Biographical sketches are required for all personnel who have a role in the *Expedition*. Follow instructions provided in the NSF GPG. Copies of publications should not be included or sent to NSF.

8. Special Information and Required Supplementary Documents: (Required information to be entered in the Supplementary Documents section of FastLane except for collaborative proposals, where **only** the lead institution should provide the information described below.)

> (8.a) Lists of Partner Institutions and Project Personnel. Provide current, accurate information for the two required lists described below. This information provides NSF and reviewers with a comprehensive list of personnel and institutions involved in the *Expedition*, and will be used when determining conflicts of interest in the review process.

> Partner Institutions. List all institutions and organizations for which there are corresponding project personnel. List all partner organizations at the time of submission of the preliminary proposal. Organize the list of institutions involved in the *Expedition* into the following categories, as applicable: Academic Institutions (colleges, universities), National Laboratories, Federal Government, Industry, Non-Governmental Organizations, State and Local Government, International, and Other. For each category, list the partner institutions for that category in alphabetical order.

> Project Personnel. List all the personnel who have a role in the *Expedition*. For each person listed, provide the first name, last name, and institution/organization.

> (8.b) Projected Commitments by Source (one-page limit). Provide a synopsis of institutional commitments for the proposed project, if any.

> (8.c) Results of Prior Support for PIs and co-PI's (2 pages). Provide information only for the PI(s) and each co-PI, for contributions to research and education in science and engineering over the past five years (from any funding source). Include a brief statement of results of funded projects.

9. Required information to be submitted to NSF via the FastLane Single Copy Documents Section, except for collaborative proposals, where **only** the lead institution should provide the information described below.

The following information should be provided in the Single Copy Document section of FastLane as a PDF file/document.

> (9.a) Project Personnel. This is the same information as entered in Section (8.a), Project Personnel.

> (9.b) Collaborators/Individuals with Conflicts of Interest. Provide the names of all persons, participants and affiliates with potential conflicts of interest as specified in the NSF GPG. For each person, enter the first name, last name, and institution/organization. For each person listed on the project personnel list, include all co-authors/editors and collaborators (within the past 48 months); list all graduate advisors and advisees; list all subawardees who would receive funds through the *Expeditions* award.

No other items or appendices are to be included. Information pertaining to "Current and Pending Support", and "Facilities, Equipment and Other Resources" is not required for preliminary proposals and should not be included. Preliminary proposals containing items other than those required above will not be reviewed or considered for NSF funding.

Full Proposal Instructions: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the guidelines specified 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-PUBS (7827) or by e-mail from nsfpubs@nsf.gov.

When preparing a full proposal for this competition, proposers are advised to review the Program Description and the Proposal Review Information found in this solicitation for general information pertinent to this program. Proposers are encouraged to review the most current NSF Grant Proposal Guide (GPG).

Every effort should be made to update information that was provided in the preliminary proposal and to fully address issues raised in the merit review of the preliminary proposal. Required proposal components and additions to or differences from the NSF GPG are given below.

1. Cover Sheet. For planning purposes, July 15 should be shown as the start date.

2. Project Summary (1 page). Provide a rationale for the *Expedition*, describing the unique opportunities to be pursued, and indicating the potential impact of the project. The summary should be informative to other persons working in the same or related fields and, insofar as possible, understandable to a scientifically or technically literate lay reader. Provide a clear description of the proposed *Expedition*, its overarching goals, its distinguishing features and foci. The names of the collaborative institutions involved and the major contribution of each to the project must be included in the description. The *Intellectual Merit* and *Broader Impacts* merit review criteria must be addressed in separate statements (see NSF's Grant Proposal Guide (GPG) for additional instructions).

3. Table of Contents (automatically generated by Fastlane).

4. Project Description. The Project Description must address Sections (4.a) through (4.c) below. Section (4.d) should be addressed, where appropriate. The Project Description is **limited to 20 pages** including tables and illustrations, regardless of the number of research groups or themes. URL's may not be used (see GPG for additional information). The Broader Impacts resulting from the proposed project must be addressed and described as an integral part of the narrative. Results from Prior NSF Support need **not** be included in the Project Description.

   (4.a) Describe the overarching vision and goal(s) of the proposed *Expedition*. Describe the contributing research, education and knowledge transfer themes or components, emphasizing how "the whole" *Expedition* is greater than the sum of the individual theme or component parts. Describe how the project will contribute to realization of the *Expedition* program goals (address all three as described in the *II. Program Description* section of this solicitation) and demonstrate the *Expedition* characteristics (address all four as described in the *II. Program Description* section of this solicitation). Provide sufficient detail to allow assessment of the Intellectual Merit and Broader Impacts of the project and the necessity for support at the requested investment level.

   (4.b) Leadership and collaboration. Describe the organizational structure of the *Expedition*, including plans for integrating and managing all organizations and individuals involved in all components of the *Expedition* to ensure the project goals are met. Explain how collaboration across individuals and organizations will be assured. Describe how effective collaboration will lead to enhanced project outcomes.

   (4.c) Intellectual property and ethics (up to 1 page). Provide a clear statement of the *Expedition's* policies on intellectual property and ethics. Discuss the nature of the research, methodologies used, ownership and ideas, and roles and responsibilities with respect to intellectual property. Describe the program of ethics to be implemented (required), which should include all project and subawardee staff (including faculty, visiting faculty, industrial fellows, postdoctoral researchers, graduate and undergraduate students).

   (4.d) Experimental systems or shared experimental facilities (where appropriate). Describe the experimental system to be demonstrated and/or shared experimental facilities (e.g., instruments, platforms, and testbeds) to be used or established and describe how these activities add value to the project.

5. Budget (see NSF GPG). Provide a detailed budget for each of the five years. FastLane will automatically generate a cumulative budget. The budget and budget justification should account for start-up time at the commencement of the *Expedition*. The budget should include funds for travel to the Washington, DC area for an annual one-day meeting of awardees. Submit a separate budget and budget justification justification (two-page limit) for each subawardee institution in cases where the budget exceeds $100,000 per year. Identify items of equipment costing more than $10,000. Full justification of the latter is required.

6. References Cited. Follow the instructions from the NSF GPG.

7. Biographical Sketches (two-page limit per person). Biographical sketches are required for all personnel who have a role in the *Expedition*. Follow instructions provided in the NSF GPG. Copies of publications should not be included or sent to NSF.

8. Special Information and Required Supplementary Documents**:** (Required information to be entered in the Supplementary Documents section of FastLane except for collaborative proposals, where **only** the lead institution should provide the information described below.)

   (8.a) Lists of Partner Institutions and Project Personnel. Provide current, accurate information for the two required lists described below. This information provides NSF and reviewers with a comprehensive list of personnel and institutions involved in the *Expedition*, and will be used when determining conflicts of interest in the review process.

   Partner Institutions. List all institutions and organizations for which there are corresponding project personnel. List all partner organizations at the time of submission of the preliminary proposal. Organize the list of institutions involved in the *Expedition* into the following categories, as applicable: Academic Institutions (colleges, universities), National Laboratories, Federal Government, Industry, Non-Governmental Organizations, State and Local Government,

International, and Other. For each category, list the partner institutions for that category in alphabetical order.

Project Personnel. List all the personnel who have a role in the *Expedition*. For each person listed, provide the first name, last name, and institution/organization.

(8.b) Projected Commitments by Source (one-page limit). Provide a synopsis of institutional commitments for the proposed project, if any.

(8.c) Results of Prior Support for PIs and co-PI's (2 pages). Provide information only for the PI(s) and each co-PI, for contributions to research and education in science and engineering over the past five years (from any funding source). Include a brief statement of results of funded projects.

9. Required information to be submitted to NSF via the FastLane Single Copy Documents Section, except for collaborative proposals, where *only* the lead institution should provide the information described below.

The following information should be provided in the Single Copy Document section of FastLane as a PDF file/document.

(9.a) Project Personnel. This is the same information as entered in Section (8.a), Project Personnel.

(9.b) Collaborators/Individuals with Conflicts of Interest. Provide the names of all persons, participants and affiliates with potential conflicts of interest as specified in the NSF GPG. For each person, enter the first name, last name, and institution/organization. For each person listed on the project personnel list, include all co-authors/editors and collaborators (within the past 48 months); list all graduate advisors and advisees; list all subawardees who would receive funds through the *Expeditions* award.

10. Information pertaining to "Current and Pending Support", and "Facilities, Equipment and Other Resources" is required for full proposals. Follow the instructions in the NSF GPG.

Proposers are reminded to identify the program solicitation number (NSF 08-568) 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.

B. Budgetary Information

Cost Sharing: Cost sharing is not required under this solicitation.

C. Due Dates

- **Preliminary Proposal Due Date(s)** *(required)* (due by 5 p.m. proposer's local time)*:*

  September 10, 2008

  September 10, Annually Thereafter

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

  February 10, 2009

  February 10, Annually Thereafter

D. FastLane Requirements

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

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

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program where they will be reviewed if they meet NSF proposal preparation requirements. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with the oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not

review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal.

A. NSF Merit Review Criteria

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

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

> **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.

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.

> **Additional Review Criteria:**

> As an elaboration of the Intellectual Merit and Broader Impacts criteria, reviewers will be asked to consider the following guidance when evaluating both preliminary and full proposals.

>> 1. Value-added of funding the activity as an *Expedition*: Are the identified research and education goals of sufficient import, scale, and/or complexity to justify this type of investment? Will the proposed activity contribute to realization of the Expeditions in Computing program goals and is it likely to demonstrate the characteristics described in the solicitation? Where necessary, comment on the value of the experimental systems or shared experimental facilities proposed.

>> 2. Leadership and Collaboration Plan: Does the leadership team convincingly demonstrate the goals, experience, and capacity to manage a complex, multi-faceted, and innovative research, education, and knowledge transfer enterprise? What is the likely effectiveness of the proposed leadership and collaboration plan? Is there documentation of institutional and other commitments to the proposed activity? Is the requested budget appropriate for the scope and complexity of the research, education and knowledge transfer projects proposed? Does the proposed collaboration approach promise significant value added?

B. Review and Selection Process

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

Following the merit review of preliminary proposals, no more than twenty proposing teams will be invited to submit full proposals. NSF expects to notify proposers of the outcome of the preliminary review process by the middle of December. Full proposals will be accepted **ONLY IF INVITED** by NSF. Unsolicited full proposals will be returned without review.

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

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

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

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

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

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

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

Special Award Conditions: It is anticipated that each *Expedition* will be merit reviewed in a site visit conducted at the end of Year 2 to assess project progress and to determine if the project warrants continued support in Years 3 through 5.

C. Reporting Requirements

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

Failure to provide the required annual or final project reports 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.

In addition, Expeditions awardees must:

- produce three project outcome "highlights" annually, that are prepared for a lay audience; these highlights will be used in NSF reporting and outreach;
- create and maintain an active project web site that shares information about the project; and
- attend a PI meeting at least once each year to share information about the project.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Mitra Basu, telephone: (703) 292-8910, email: mbasu@nsf.gov

For questions related to the use of FastLane, contact:

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

IX. OTHER INFORMATION

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

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

> The *Expeditions* program provides CISE investigators with access to a diverse set of CISE funding opportunities. CISE core programs provide funding for projects ranging from modest single investigator activities through larger multi-investigator efforts funded at levels of approximately $1,000,000 per year. *Expeditions* complement these investments, supporting ambitious, multi-investigator projects requiring annual investments up to $2,000,000. For research and education projects with scopes that require even larger funding levels, PIs are encouraged to consider the opportunities provided by NSF's Engineering Research Center (ERC) and Science and Technology Center (STC) programs. The ERC and STC programs support projects with annual budgets of $3,000,000 to $4,000,000 for up to ten or eleven years.

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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 40,000 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 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.
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- **For General Information** (NSF Information Center)**:**   (703) 292-5111
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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
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Arlington, VA 22230

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