Broadening Participation in Computing (BPC)

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

Letter of Intent Due Date(s) *(required):*

April 12, 2006

    Letters of Intent are required for Supplements ONLY

August 09, 2006

    Letters of Intent are required for Supplements ONLY

December 13, 2006

    Letters of Intent are required for Supplements ONLY

April 11, 2007

    Letters of Intent are required for Supplements ONLY

August 08, 2007

    Letters of Intent are required for Supplements ONLY

December 12, 2007

    Letters of Intent are required for Supplements ONLY

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

May 17, 2006

    For Alliance and Demonstration Projects (Letters of Intent not required)

May 16, 2007

    For Alliance and Demonstration Projects (Letters of Intent not required)

REVISIONS AND UPDATES

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

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

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

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

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that collaborative proposals submitted in response to this Program Solicitation via Grants.gov will be requested to be withdrawn and proposers will need to resubmit these proposals via FastLane.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

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

C. All Letters of Intent must be submitted via the NSF FastLane system.

This solicitation replaces NSF 05-562. The following items are major revisions to the previous program solicitation:

1. The deadlines for Full Proposals were changed from early April to mid May;

2. Maximum award amounts were modified;

3. PI Eligibility has been changed so that a person can be a PI or CoPI on at most one Alliance and one Supplement proposal in a competition; and,

4. Minor corrections and clarifications have been made throughout the text and PIs are advised to read the Synopsis and Program Description carefully.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Broadening Participation in Computing (BPC)

Synopsis of Program:

The Broadening Participation in Computing (BPC) program aims to significantly increase the number of U.S. citizens and permanent residents receiving post secondary degrees in the computing disciplines. Initially, its emphasis will be on students from communities with longstanding underrepresentation in computing: women, persons with disabilities, and minorities. Included minorities are African Americans, Hispanics, American Indians, Alaska Natives, Native Hawaiians, and Pacific Islanders. The BPC program seeks to engage the computing community in developing and implementing innovative methods to improve recruitment and retention of these students at the undergraduate and graduate levels. Because the lack of role models in the professoriate can be a barrier to participation, the BPC program also aims to develop

effective strategies for identifying and supporting members of the targeted groups who want to pursue academic careers in computing. While these efforts focus on underrepresented groups, it is expected that the resulting types of interventions will improve research and education opportunities for *all* students in computing.

There are three components to the BPC program:

Alliances. Broad Alliances of institutions and organizations will design and carry out comprehensive programs that address underrepresentation in the computing disciplines. Alliances will join academic institutions of higher learning with secondary (and possibly middle) schools, government, industry, professional societies, and other not-for-profit organizations. In most cases, Alliances will involve multiple academic institutions of higher learning. Together, the participants will (1) develop and implement interventions that support students, (2) create sustainable changes in culture and practices at the institutional, departmental, and organizational levels, and (3) serve as models and repositories for effective practices to broaden participation. The emphasis will be on activities that have significant impact both in the quality of opportunities afforded to students and in the number of students potentially served. While the focus is on implementations, an Alliance may include complementary research that informs the design of its activities. The leveraging of existing efforts both across and within the targeted communities is strongly encouraged.

Demonstration Projects. Demonstration Projects (DPs) are smaller in scope and narrower in focus than Alliance projects. Typically DPs will be pilots of innovative programs that, once fully developed, could be incorporated into the activities of an Alliance. Projects might, for example, be proposed by a single institution or might focus on a specific underrepresented community, a specific point in the academic pipeline, or on a specific impediment to full participation in computing. As in the case of Alliances, complementary, well-defined research aimed at informing the development of the project can be included.

Supplements. Supplements to existing CISE grants will be made in order to engage more members of the computing research community in significant BPC efforts. These supplements will increase target community participation in specific research areas.

Cognizant Program Officer(s):

- Janice Cuny, Program Director, Directorate for Computer & Information Science & Engineering, Division of Computer and Network Systems, 1175 N, telephone: (703) 292-8950, fax: (703) 292-9010, email: jcuny@nsf.gov
- Caroline E. Wardle, Senior Science Advisor, Directorate for Computer & Information Science & Engineering, Division of Computer and Network Systems, 1175 N, telephone: (703) 292-8950, fax: (703) 292-9010, email: cwardle@nsf.gov
- Harriet G. Taylor, Program Manager, Directorate for Computer & Information Science & Engineering, Division of Computer and Network Systems, 1175 N, telephone: (703) 292-8950, fax: (703) 292-9010, email: htaylor@nsf.gov

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

- 47.070 --- Computer and Information Science and Engineering

Eligibility Information

- **Organization Limit:** There is no organization limit. However, at least one participant in an Alliance proposal must be a degree-granting, academic institution of higher learning located in the U.S., its territories or possessions, or a consortium of such institutions.
- **PI Eligibility Limit:** A person can be a PI or CoPI on at most one Alliance and one Supplement proposal in a competition (although he or she may serve in other capacities on additional proposals.)
- **Limit on Number of Proposals:** None Specified.

Award Information

- **Anticipated Type of Award:** Other - Standard or Continuing Grants, or Supplements
- **Estimated Number of Awards:** 10 to 20
- **Anticipated Funding Amount:** $14,000,000 in FY2007 pending the availability of funds and the quality and size of the proposals submitted.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

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

- **Full proposals submitted via FastLane:**
    - Grant Proposal Guide (GPG) Guidelines apply

- **Full proposals submitted via Grants.gov:**
    - NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: http://www.nsf.gov/bfa/dias/policy/docs/grantsgovguide.pdf) To obtain copies of the Application Guide and Application Forms Package: click on the Apply tab on the Grants.gov website, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required by NSF.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Not Applicable.

C. Due Dates

- **Letters of Intent** *(required):*
    April 12, 2006
        Letters of Intent are required for Supplements ONLY
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    May 16, 2007
        For Alliance and Demonstration Projects (Letters of Intent not required)

Proposal Review Information

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

Award Administration Information

- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Additional reporting requirements apply. Please see the full text of this solicitation for further information.

TABLE OF CONTENTS

I. INTRODUCTION

Information technology (IT) is one of the fastest-growing areas of job growth. Department of Labor projections have IT job growth outstripping IT degree production for the current decade. If the U.S. economy is to remain competitive, we must increase the number of students receiving undergraduate and graduate degrees in the computing disciplines. This increase must occur across all segments of our population, but it is particularly important among those groups that historically have not participated at high rates: minorities, women, and persons with disabilities. The under participation of these groups causes a loss of opportunity for individuals, a loss of talent to the workforce, and a loss of diverse perspectives and creativity in shaping the future of technology.

II. PROGRAM DESCRIPTION

The Broadening Participation in Computing (BPC) program is intended to significantly increase the number of domestic students receiving post secondary degrees in the computing disciplines. Initially, its emphasis will be on those communities that have a longstanding underrepresentation in computing: persons with disabilities, women, and minorities. Included minorities are African Americans, Hispanics, American Indians, Alaska Natives, Native Hawaiians, and Pacific Islanders. Members of these groups participate in computing at rates well below their proportionate representation in the population. At the same time, it is expected that the types of interventions developed for these students will improve research and education opportunities for *all* students in computing.

Specifically, the BPC program aims to develop and implement innovative models for recruiting, mentoring, and retaining students from the underrepresented communities in post secondary programs in the computing disciplines. Since the lack of role models in the professoriate can be a barrier to participation, the program also aims to develop effective strategies for identifying and supporting students from the targeted groups who want to pursue academic careers in computing. While the focus is on implementation, a project may include complementary research that informs the design of its activities. PIs are encouraged to include social scientists in any research, evaluation, and assessment activities.

NSF intends to support a portfolio of projects under the BPC program that serve as effective models for addressing issues of underrepresentation. The program will have three components: Alliances; Demonstration Projects; and Supplements.

Projects involving broadening participation efforts in any of the fields normally supported by CISE are eligible. Alliance projects (but not necessarily Demonstration Projects or Supplements) should be comprehensive, covering a wide range of computing areas.

Alliances

The BPC program seeks to build broad Alliances – joining academic institutions of higher learning with secondary (and possibly middle) schools, industry, government, professional societies, and other not-for-profit organizations – to implement comprehensive programs that address underrepresentation in the computing disciplines. In most cases, Alliances will involve more than one academic institution of higher learning. Alliances will (1) develop and implement interventions that support students, (2) create sustainable changes in culture and practices at the institutional, departmental, and organizational levels, and (3) serve as models and repositories for effective practices in broadening participation. The emphasis will be on activities that will have significant impact both in the quality of opportunities afforded to students and in the number of students potentially served. Alliances that leverage BPC efforts both across and within underrepresented communities are strongly encouraged.

The BPC program is not intended to support efforts that involve primarily curriculum development or fellowships, although they can be included as part of a larger set of activities (see below for a description of allowable student support). Research on issues of underrepresentation is allowable only if it is narrowly focused on informing the development of the Alliance's implementation projects. Finally, while K-12 interventions are encouraged as part of a broader set of Alliance activities, we expect to fund very few proposals that are primarily focused on K-12.

An Alliance consists of two or more institutions or organizations. At least one participant must be a degree-granting, academic institution of higher learning located in the U.S. its territories or possessions, or a consortium of such institutions. One participant must be designated as the lead for the project. Institutions and organizations can be added over the course of the project.

An Alliance should address underrepresentation with a coordinated and comprehensive set of implementation projects. Complementary research that informs Alliance activities can be included. Proposals should clearly describe the objectives and strategies with respect to the underrepresented groups served. Strategies may include, but are not limited to:

- Development and implementation of outreach programs to create positive engagement of students at all levels in the computing disciplines;
- Development of immersive bridge programs to increase the preparedness of students making critical transitions in the academic pipeline: from high school to college, from 2 to 4 year postsecondary programs, from undergraduate to graduate education, or from graduate school to the professoriate;
- Support for student participation in enriched research and internship programs that are part of a comprehensive set of student mentoring and support activities;
- Development of systemic mentoring and mentor training programs;
- Development of student networks and peer support programs;
- Support for students to attend conferences and mechanisms to maximize the benefits they get from their attendance;
- Development of innovative methods for career counseling and career placement;
- Development of programs and incentives for faculty and student exchanges in support of collaborative research and education activities;
- Support for faculty as they enter the professoriate so that they can become actively and competitively engaged in research; and,
- Research and assessment activities aimed at informing the projects and activities of the Alliance.

These activities are merely illustrative of the broad range of activities that are possible under the program. Other innovative activities are encouraged.

Institutions with documented success in producing minority degrees in the computing disciplines are strongly encouraged to participate. Alliances are encouraged to partner with institutions that graduate large numbers of undergraduate students from the underrepresented groups (e.g., Historically Black Colleges and Universities (HBCUs), Hispanic-Serving Institutions (HSIs), Tribal Colleges and Universities, and institutions with strong programs serving persons with disabilities). They are also encouraged to develop linkages with other related NSF-supported programs including (but not limited to) the Louis Stokes Alliances for Minority Participation (LSAMP), the Historically Black Colleges and Universities Undergraduate Program (HBCU-UP), the Tribal Colleges and Universities Program (TCUP), the Alliances for Graduate Education and the Professoriate (AGEP), the program for Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers (ADVANCE), and Cyberinfrastructure-TEAM (CI-TEAM).

Competitive projects must include evaluation and assessment components that can effectively document both successes and failures. Awardees must set (and meet) measurable goals and collect evidence to determine progress toward those goals. Awardees must also participate in a BPC program-level evaluation, and supply data (disaggregated by ethnicity, gender, and

discipline). Alliance proposals must include a comprehensive dissemination plan.

In support of these activities, the BPC program provides funding in a variety of cost categories, including:

- Provision for faculty release time and summer salary;
- Program coordination and clerical support;
- Special workshop/seminar support costs;
- Participant costs;
- Peer mentoring stipends;
- Faculty/student travel between institutions (for recruitment, joint research, etc.); and,
- Evaluation and assessment costs.

BPC is not intended to be a fellowship program. Allowable student support is limited to individual skill development (e.g. participation in special seminars and colloquia or bridge/transition programs), involvement in research (e.g. stipends or salaries for academic year or summer research programs), related personal career counseling and mentoring, and other activities designed to enhance student experiences and student/faculty/mentor interaction. If financial support is requested, proposers must clearly explain the need being addressed, as well as student recruitment, selection, and accountability criteria. Further, the program is not intended to fund faculty research programs except where that support is given to junior faculty to increase their potential for participating competitively in the research community with the aim of increasing the pool of role models and mentors available to students from underrepresented groups. BPC program funds are not intended to replace funding for existing programs. In each case, funding requested must be clearly justified as necessary to the successful completion of the project. Budgets and proposed projects should be appropriate for the stage of development of the Alliance.

Demonstration Projects

The Demonstration Project (DP) component seeks to develop innovative projects and strategies that could be effectively adopted by BPC Alliances. Typically Demonstration Projects will be pilots which, if proven successful, could be scaled for larger impact. It is anticipated that these projects will have a smaller scope and a more narrow focus than Alliance projects. They might be proposed by a single institution or target, for example, one underrepresented community, a specific point in the academic pipeline, or a single impediment to full participation in computing. It is possible for a DP to be focused entirely on K-12 although we expect to fund very few of those. As in the case of Alliances, Demonstration Projects can include complementary research aimed at informing the development of the project. Where appropriate, DPs can be proposed in the context of an existing Alliance.

Proposed Demonstration Projects should fall within the scope of Alliance activities as described above. Proposers should demonstrate an understanding of the issues involved in underrepresentation and a commitment to addressing them. Unlike the Alliance awards, Demonstration Project awards may be made to a single institution or organization. Like Alliances, projects must have clearly defined objectives and strategies with respect to underrepresented groups served, and they must include strong evaluation and assessment components that document both their successes and failures.

Supplements

Too often efforts at Broadening Participation are left to a dedicated few. This component of the BPC program aims to involve more members of the computing research community in significant BPC projects by funding supplements to existing CISE grants. The supplements are intended to support innovative projects led by single investigators (or small groups of co-investigators) aimed at the inclusion of additional students and researchers from the underrepresented communities in their research area and activities.

Supported activities can be similar to those described for Alliances as above, but their focus should be on engaging students and faculty from the underrepresented communities in the specific research area of the supplemented grant. Supplements might fund, for example, summer schools to introduce students to a computing research topic, tutorial sessions and additional mentoring at research conferences, student exchanges between research labs, or area-specific student research forums. Proposed projects should have clearly defined objects and strategies, and should include an evaluation and assessment plan.

BPC supplemental requests will be considered for budgets up to $100,000 over one to two years. All BPC supplements will be competitively reviewed; requests in excess of 20% of the existing grant size will be externally reviewed under normal merit review procedures. Supplements will not be given if they would require an extension beyond the expiration date of the original grant.

CISE PIs interested in submitting a BPC supplement request **MUST** first submit a letter of intent through FastLane on or before the due dates stated in this solicitation. After a brief review by the Program Officers, a recommendation either for or

against submitting a supplement request will be sent to the PI. Supplemental requests will be considered for funding **ONLY** after such a recommendation has been sent. At that point, the PI should submit the request for BPC supplemental support electronically through FastLane. See details in Section V.

III. ELIGIBILITY INFORMATION

- **Organization Limit**: There is no organization limit. However, at least one participant in an Alliance proposal must be a degree-granting, academic institution of higher learning located in the U.S., its territories or possessions, or a consortium of such institutions.

- **PI Eligibility Limit**: A person can be a PI or CoPI on at most one Alliance and one Supplement per competition (although he or she can serve in other capacities on multiple proposals).
- **Limit on Number of Proposals**: None specified

IV. AWARD INFORMATION

BPC awards will be made in three categories: standard or continuing grants, or supplements.

Alliance awards can range from $100,000 to $750,000 per year for three years; maximum amount $2,000,000.

Demonstration Project awards can range to $200,000 per year for three years; average amount $500,000.

Supplements will be for a maximum of $100,000 for a one to two year project.

Funds for the BPC program are estimated to be $14 million in FY 2007. Estimated number of awards is subject to the quality and size of the proposals submitted and the availability of funds.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent *(required):*

Letters of intent are required for BPC supplement proposals only. Letters of intent must be submitted only through NSF's FastLane system on or before the due dates stated in this solicitation. Letters of intent may not be submitted through Grants. gov. The letter of intent should include the PI's existing CISE grant number, the proposed budget request level, and a one paragraph description of the proposed supplemental project. See additional information under "Instructions for Supplement Proposals" (below).

Full Proposal Instructions:

Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane:

  Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF Website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov. Proposers are reminded to identify this program announcement/solicitation number in the program announcement/solicitation block on the NSF Cover Sheet For Proposal to the National Science

Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

- Full proposals submitted via Grants.gov:

  Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants. gov website and on the NSF website at: (http://www.nsf.gov/bfa/dias/policy/docs/grantsgovguide.pdf). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

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

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

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

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

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

C. All Letters of Intent must be submitted via the NSF FastLane system.

The following instructions supplement the GPG guidelines.

I. Instructions for Alliance and Demonstration Projects

Proposal Title. To assist NSF staff in sorting proposals for review, proposal titles should begin with an acronym that identifies the solicitation being addressed.

- "BPC-A:" for Alliances, and
- "BPC-DP:" for Demonstration Projects.

Project Description Page Limit.

Standard page limits apply for Demonstration Project proposals. The body of the project description of an Alliance proposal must fit within the standard 15 page limit but an additional 1 to 5 pages can be included for Results from Prior NSF support.

Project Description Content. Project descriptions should include the following sections.

- **Project Goals and Outcomes.** Clearly describe the goals and anticipated outcomes of the proposed project. Project goals should be clearly informed by the participating organizations' demonstrated knowledge of factors affecting the successful recruitment and retention of students from the underrepresented communities targeted through undergraduate study, graduate study, and academic career entry.
- **Implementation Plan.** Describe in detail the activities to be undertaken to realize the project goals and anticipated outcomes.
  - Highlight the potential for successfully aligning with similar programs and efforts (NSF-supported or otherwise) within and across the targeted communities to ensure a comprehensive, integrated effort.
  - Describe the creative, strategic actions that promise significant improvements in underrepresented group

participation and retention in computing disciplines.
- Describe the research base on which the project builds and, if appropriate, describe the research that will further contribute to the knowledge base associated with increasing the participation of underrepresented groups in computing.
- Describe plans to disseminate the results of the project, both positive and negative.

- **Partnership Plan.** Alliance proposals and Demonstration Project proposals that are submitted by partnerships must provide evidence of the following:
  - The participating organizations will work together to realize the project goals and that all key stakeholders (including faculty and administrators) participated in project planning and design;
  - The institutional and organizational commitment to the project goals;
  - The participating organizations have had experience in dealing with the non-academic components of undergraduate and graduate education that are necessary to insure the success of underrepresented minorities, persons with disabilities, and women in obtaining computing degrees; and,
  - The commitment of the participating organizations to sustain the proposed institutional and organizational change.
- **Evaluation Plan.** Describe the evaluation plan that will guide the project progress and measure its impact, including a description of the instruments/metrics by which the project leaders will measure, document, and report on the project's progress. Please note that many of the project evaluations will involve human subjects and, therefore, will need Institutional Review Board (IRB) approval from the submitter's institution before funding can be awarded.

II. Instructions for Supplement Proposals

CISE PIs interested in submitting a BPC supplement request **MUST** submit a letter of intent through FastLane on or before the due dates stated in this solicitation. The letter of intent should include the PI's existing CISE grant number, the proposed budget request level, and a one paragraph description of the proposed supplemental project. CISE BPC program officers may contact the PI directly for further information. After a brief review by the Program Officers, a recommendation to proceed or not to proceed with a supplement request will be sent to the PI. Supplemental requests will be considered for funding ONLY after such a recommendation has been sent. At that point, a request for a BPC Supplement should be electronically submitted through FastLane in accordance with the GPG guidelines for the submission of requests for supplemental support. It must include a summary of the proposed BPC project, a justification of the need for the funds, and a budget, highlighting the use by budget category, of the additional funding.

Proposers are reminded to identify the program announcement/solicitation number (06-540) in the program announcement/ solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost Sharing:

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

C. Due Dates

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

Letters of Intent *(required):*

> April 12, 2006
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Full Proposal Deadline(s) (due by 5 p.m. submitter's local time):

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May 16, 2007
    For Alliance and Demonstration Projects (Letters of Intent not required)

D. FastLane/Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

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

Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. Further instructions regarding this process are available on the FastLane Website at: http://www.fastlane.nsf.gov/

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

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. The Grants.gov's Grant Community User Guide is a comprehensive reference document that provides technical information about Grants.gov. Proposers can download the User Guide as a Microsoft Word document or as a PDF document. The Grants.gov User Guide is available at: http://www.grants.gov/CustomerSupport. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF pr ogram staff contact(s) listed in Section VIII of this solicitation.

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

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

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

The National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 (NSB 97-72). All NSF proposals are evaluated through use of the two merit review criteria. In some instances, however, NSF will

employ additional criteria as required to highlight the specific objectives of certain programs and activities.

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

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

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

The two National Science Board approved merit review criteria are listed below (see the Grant Proposal Guide Chapter III.A for further information). The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which he/she is qualified to make judgments.

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

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

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

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

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

Additional Review Criteria:

The following additional review criteria apply to Alliance and Demonstration Project proposals only.

- The degree to which proposers have demonstrated awareness of the issues and remedies of underrepresentation.
- The degree to which the proposal describes a comprehensive evaluation plan.

The following criteria apply to Alliance proposals only.

- The degree to which the proposal demonstrates institutional and organizational commitment that the project will be sustainable and part of a comprehensive effort to address underrepresentation.
- The degree to which the proposal includes an effective plan for dissemination.

B. Review Protocol and Associated Customer Service Standard

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

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

In most cases, proposers will be contacted by the Program Officer after his or her recommendation to award or decline funding has been approved by the Division Director. This informal notification is not a guarantee of an eventual award.

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

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1); * or Federal Demonstration Partnership (FDP) Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

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

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

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

C. Reporting Requirements

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

BPC Alliance and Demonstration Project awardees will be expected to participate in a BPC program-level evaluation by which NSF can assess quantitative gains in relevant measures. Shortly after the awards have been made, project evaluators will be asked to assist in developing a program evaluation that will mutually benefit the agency and project participants. The participants will be expected to collect and analyze data (disaggregated by ethnicity, gender, and discipline) for this evaluation. Awardees may also be asked to participate in annual PI meetings to report on their progress.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for the PI and all Co-PIs. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project reporting system, available through FastLane, for preparation and submission of annual and final project reports. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system.

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding this program should be made to:

- Janice Cuny, Program Director, Directorate for Computer & Information Science & Engineering, Division of Computer and Network Systems, 1175 N, telephone: (703) 292-8950, fax: (703) 292-9010, email: jcuny@nsf.gov
- Caroline E. Wardle, Senior Science Advisor, Directorate for Computer & Information Science & Engineering, Division of Computer and Network Systems, 1175 N, telephone: (703) 292-8950, fax: (703) 292-9010, email: cwardle@nsf.gov
- Harriet G. Taylor, Program Manager, Directorate for Computer & Information Science & Engineering, Division of Computer and Network Systems, 1175 N, telephone: (703) 292-8950, fax: (703) 292-9010, email: htaylor@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.

For questions related to the use of FastLane, contact:

- Sharon Glivens, Program Technology Specialist, Directorate for Computer & Information Science & Engineering, Division of Computer and Network Systems, 1175 N, telephone: (703) 292-8950, fax: (703) 292-9010, email: sglivens@nsf.gov

IX. OTHER PROGRAMS OF INTEREST

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

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

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

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

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

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

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

- **To Order Publications or Forms:**

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

  or telephone: (703) 292-7827

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

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Division of Administrative Services, National Science Foundation, Arlington, VA 22230.

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