

CISE Pathways to Revitalized Undergraduate Computing Education (CPATH)

PROGRAM SOLICITATION

NSF 08-516

REPLACES DOCUMENT(S):

NSF 06-608



National Science Foundation

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

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

March 11, 2008

REVISION NOTES

Major changes in CPATH solicitation:

1. Elimination of CISE Distinguished Education Fellow (CDEF) component;
2. Streamlined award structure into two distinct tracks, Community Building and Institutional Transformation;
3. Addition of a Conceptual Development and Planning (CDP) grant category in the Institutional Transformation track;
4. Combination of former Evaluation, Adoption, and Extension (EAE) and Transformation (T) award categories into a single grant category, Transformative Implementation (TI) in the Institutional Transformation track;
5. Inclusion of enhanced language on CPATH evaluation requirements;
6. Addition of an emphasis on computational thinking approaches; and
7. Addition of language to clarify issues identified in the first competition.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

CISE Pathways to Revitalized Undergraduate Computing Education (CPATH)

Synopsis of Program:

Computing has permeated and transformed almost all aspects of our everyday lives. As computing becomes more important in all sectors of society, so does the preparation of a globally competitive U.S. workforce with the ability to generate and apply new knowledge to solve increasingly complex problems and understand human behavior. Unfortunately, despite the deep and pervasive impact of computing and the creative efforts of individuals in a small number of institutions, undergraduate computing education today often looks much as it did several decades ago.

The field of computing has broadened to include applications that often require integration of multidisciplinary domains to support computationally intense e-science environments. Emerging information technology disciplines offer unique opportunities to develop the next generation of computing education models that respond to technological trends and that meet many stakeholders' needs and expectations. At the same time, new transformative educational models have the potential to respond to current challenges such as addressing fluctuating enrollments in undergraduate computing, increasing relevance of educational experiences through industry connections, developing leaders and communities to foster revitalization efforts, and integrating fast-paced computing innovations into the curriculum.

Future students will expect to see academic pathways that allow them to pursue careers that require blended experiences in multiple disciplines with a strong computational and computing core of knowledge. Models and methods based on computational thinking offer particular promise in meeting these expectations. Computational thinking involves solving problems and designing complex systems using a range of mental tools reflecting the breadth of the fields of computer science and computing. Computational thinking has already influenced the nature of many scientific disciplines and the range of scientific challenges that can be realistically conquered. Thus,

computational thinking skills can provide the basis for transformative models for undergraduate computing education that offer exciting, relevant academic pathways in which students and faculty can thrive.

Through the CISE Pathways to Revitalized Undergraduate Computing Education (CPATH) program, NSF's Directorate for Computer and Information Science and Engineering (CISE) is challenging its partners – colleges, universities and other stakeholders committed to advancing the field of computing and its impact - to **transform undergraduate computing education on a national scale**, to meet the challenges and opportunities of a world where computing is essential to U. S. leadership.

The CPATH vision is of a U.S. workforce with the computing competencies and skills crucial to the Nation's health, security and prosperity in the 21st century. This workforce includes a cadre of professionals with the computing depth and breadth needed for sustained leadership in a wide range of application domains and career fields, and a broader professional workforce with deep knowledge and understanding of critical computing concepts, computational thinking methodologies and techniques.

To achieve this vision, CISE is calling for colleges and universities to work together and with other stakeholders to formulate and implement plans to revitalize undergraduate computing education in the United States. The full engagement of faculty and other individuals in CISE disciplines will be critical to success. Successful CPATH projects will be systemic in nature and will demonstrate significant potential to contribute to the transformation and revitalization of undergraduate computing education on a national scale.

CPATH will support three *types* of projects in two major track categories, Community Building and Institutional Transformation:

Community Building Track

- Community Building (CB) Grants

Institutional Transformation Track:

- Conceptual Development and Planning (CDP) Grants
- Transformative Implementation (TI) Grants

Cognizant Program Officer(s):

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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: 17 to 30 total. 10 to 15 Community Building (CB) awards several of which may be focused at the national level; 5 to 10 Conceptual Development and Planning (CDP) Awards; 2 to 5 Transformative Implementation (TI) awards.

Anticipated Funding Amount: \$5,000,000 in FY 2008 pending the availability of funds. CB projects will be funded from levels of \$50,000 to a maximum of \$500,000 total for durations of up to three years. CDP projects will be funded at levels of \$50,000 up to a maximum of \$150,000 total for durations of up to two years. TI projects will be funded at levels up to \$1,000,000 total for a maximum duration of three years.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- Organizational limits differ by CPATH project type as defined below:

For CB projects. GPG eligibility guidelines apply.

For CDP and TI projects. Universities and two- and four-year colleges (including community colleges) located and accredited in the United States, its territories or possessions, or the Commonwealth of Puerto Rico, that award degrees in a field supported by NSF are eligible to apply for CDP and TI awards. Such organizations also are referred to as academic institutions.

CPATH proposals that describe partnerships with other organizations with a stake in undergraduate computing education are strongly encouraged. Partner organizations may include industry, professional societies, and not-for-profit organizations, amongst others.

PI Limit:

At least one individual on the project leadership team (PI or co-PI) must be a member of the community served by CISE.

Limit on Number of Proposals per Organization:

For CDP and TI proposals: an academic institution may submit or participate in no more than one TI and one CDP proposal. There is no organizational limit for CB proposals.

Limit on Number of Proposals per PI: 2

An individual may participate as PI, Co-PI, or Senior Personnel on at most one CDP or TI proposal. An individual may also participate as PI, Co-PI or Senior Personnel on at most one CB proposal.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

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

B. Budgetary Information

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

C. Due Dates

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):
March 11, 2008

Proposal Review Information Criteria

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

Award Administration Information

Award Conditions: Standard NSF award conditions apply.

Reporting Requirements: Standard NSF reporting requirements apply.

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I. INTRODUCTION

Computing has permeated and transformed almost all aspects of our everyday lives. As computing becomes more important in all sectors of society, so does the preparation of a globally-competitive U.S. workforce with knowledge and understanding of critical computing concepts, methodologies, and techniques. Computational thinking is rapidly becoming an essential skill for students in all disciplines. Unfortunately, despite the deep and pervasive impact of computing and the creative efforts in a small number of institutions, undergraduate computing education today often looks much as it did several decades ago. To date, undergraduate computing education has been highly heterogeneous, and has suffered from a lack of recognized leaders or mechanisms for identifying leaders. Often, the small grassroots communities that have emerged flounder due to lack of leadership, administrative support or other resources needed to help them flourish. To enable systemic changes within institutions, among groups of institutions, and at the national level, leaders must be nurtured, communities supported, and educational and organizational change catalyzed and sustained. The CPATH program seeks to promote projects that will revitalize undergraduate computing education on a broad scale and develop innovative academic partnerships and pathways that will prepare undergraduates to enter, lead, and thrive in the challenging workplaces and computing environments of the future.

II. PROGRAM DESCRIPTION

The CISE Pathways to Revitalized Undergraduate Computing Education (CPATH) vision is of a U.S. workforce with the computing competencies and skills crucial to the Nation's health, security and prosperity in the 21st century. This workforce includes a cadre of professionals with the computing depth and breadth needed for sustained U.S. leadership in a wide range of application domains and career fields, and a broader professional workforce with deep knowledge and understanding of critical computing concepts, computational thinking methodologies and techniques.

To achieve this vision, NSF's Directorate for Computer and Information Science and Engineering (CISE) is challenging colleges and universities to work together and with others with a stake in undergraduate computing education, including industry, professional societies and other types of organizations, to formulate and implement plans to transform undergraduate computing education to meet the challenges and opportunities of our 21st century world. Critical to this work is the full engagement of faculty and other individuals representing CISE disciplines.

In the aggregate, CPATH projects will:

- Enable implementation of integrative models for undergraduate computing education that are replicable across a variety of programs and institutions, and have a high probability of adoption on a national scale;
- Foster the integration of computational thinking approaches into all undergraduate academic disciplines;
- Nurture emerging undergraduate computing education communities and leaders to ensure a continuing sustained focus on innovation in computing education;
- Provide models for new multi-disciplinary programmatic pathways for undergraduate computing education;
- Contribute to the development of a diverse, agile workforce with the computing knowledge essential to U.S. leadership in the global innovation enterprise;
- Promote the formation of partnerships among academic institutions, industry and other organizations with a stake in the revitalization of undergraduate computing education; and
- Develop exemplar pathways for institutions to reinvigorate undergraduate computing education.

In the FY 2008 competition, CISE will support CPATH awards in two tracks, Community Building and Institutional Transformation, as defined below.

Community Building Track

The Community Building track provides support for development of communities distributed across many institutions and organizations who are focused on common goals and activities to revitalize undergraduate computing education. This might include a topical focus, pedagogical focus, geographical focus, or any other common framework that defines the community of stakeholders actively working on revitalizing undergraduate computing education. Community building can take place within and across disciplines or within blended multi-disciplinary groups. Community building activities focus on developing, nurturing, supporting, and sustaining the group through ongoing active involvement of a diverse set of community participants.

Many community members will be actively engaged in producing pilot activities at their own institutions and in building community resources and support structures to share their experiences, models, and expertise in the area of common interest. Community Building Projects may lead to the development of focused institutional transformation projects at one or more of the institutions of the participating faculty.

Community Building Projects

Community Building (CB) awards will support efforts that bring a diverse group of stakeholders together to develop, nurture, and sustain communities that are actively engaged with a common intellectual focus or goals related to revitalization of undergraduate computing education. Community Building projects have four central elements: community focus and goals, leadership development, well-planned activities for ongoing engagement and broadening of communities, and clear support of the communities involved. These elements should be clearly documented in CPATH CB proposals. Typical community building projects involve a team of leaders, rather than a single PI, and include documentation of relevant prior activities related to the community that is being served. Community building efforts focused on multidisciplinary communities that blur traditional bounds of computer science are particularly encouraged.

The scope of CB activities is deliberately broad and can involve a range of activities. Activities must be designed in the context of the current state of the community served or engaged, as well as with full awareness of prior work already underway within the

community. In the development of community building proposals, PIs may wish to consider the following: strategies for broad faculty engagement should be articulated in all projects; all projects should include plans for sustainable implementation within the participating organizations and institutions; in projects including industry stakeholders, industry partners should actively participate in the education activities as well as the research activities of the participating institutions and faculty; projects with international components should clearly articulate a strategy to prepare students for participation in a global economy; and, projects involving workshops and national forums should include active ongoing engagement of the target communities after the workshops and clear goals for the sustained development and support of the communities, as well as follow-up and dissemination activities.

All projects in the community building track are encouraged to include secondary teachers and students in meaningful ways motivated by the project goals. Projects that build communities focused on the integration of computational thinking approaches into the curriculum at the undergraduate level with outreach connections to secondary schools are specifically encouraged.

Projects must include plans for evaluation and assessment of the project to effectively document both successes and failures, as well as for sustainability of the communities beyond the period of funding. CISE encourages proposers to develop and implement creative strategies likely to result in transformative activities at institutional, local, regional and/or national levels and across all institution types. Community building projects may lead to the development of focused transformative implementation projects at one or more of the institutions. The transformative implementation projects that result will by design include broader institutional participation and a shared vision for institutional transformation.

Institutional Transformation Track

The Institutional Transformation Track provides support for single institutions or coordinated groups of multiple institutions to develop and implement transformative models of innovative undergraduate computing education within the participating institution or institutions. Institutional Transformation projects include not only curricular reform, but also institutional infrastructure and administrative reform, and clear participation of broad groups of faculty within each institution in the transformative activities. Projects that may result in new and innovative pathways for faculty and student participation in undergraduate computing education are particularly encouraged.

The Institutional Transformation Track includes two project types: Conceptual Development and Planning (CDP) projects and Transformative Implementation (TI) projects. Together these two types of projects form a pathway for institutional revitalization of undergraduate computing education. CDP awards support the first steps in conceptual design and planning prior to large scale institutional implementation. TI awards support full implementation of models, usually preceded by extensive planning pilot activities. Investigators should assess the readiness state of the institution to determine which of the two project categories (CDP or TI) to pursue.

CDP awards provide support for institutions at early stages of their transformative process. Some institutions will require one to two years of support for initial activities within the institution to develop the basic conceptual design for institutional transformation and corresponding implementation plans. Other institutions with a clear agreement on their transformative conceptual design will require support for a one year implementation planning phase. It is expected that CDP projects will result in concrete plans and institutional commitments for implementing the models designed and that a well formulated CPATH Transformative Implementation proposal will be developed.

TI awards provide support for large scale implementation and institutionalization of innovative models for revitalizing undergraduate computing education at one or more participating institutions. Investigators must document institutional readiness for the implementation, including prior conceptual development and planning, any prior pilot activities, and institutional commitment for the implementation. TI awards may involve basic implementation at a particular institution or extension of a prior implementation within an institution combined with adaptation and adoption implementation at other institutions.

The two Institutional Transformation award types, Conceptual Development and Planning (CDP) and Transformative Implementation (TI), are defined below.

Conceptual Development and Planning (CDP) Projects.

Conceptual Development and Planning (CDP) awards will support the institutional groundwork preparation for institutional transformative implementation activities. CDP grants support conceptual design and planning for innovative programs and academic structures involving collaborative computing-intensive disciplinary units or groups of faculty. CDP activities must be targeted at moving multiple departments or schools within a single institution or group of institutions towards transformative learning which goes beyond the more common process of assimilative learning.

Institutions just beginning transformative processes may wish to start with a CPATH CDP project proposal. Funds can be requested for developing faculty collaborative groups, convening workshops and focused activities for designing conceptual frameworks, gaining faculty and administrative organizational support, and laying the foundation for the infrastructure changes needed to realize the implementation of the institutional transformative vision for undergraduate computing education. CDP projects are expected to address ALL planning aspects essential to the preparation of a strong CPATH Transformative Implementation (TI) project.

Transformative Implementation (TI) Projects.

Transformative Implementation projects have a focus on transformation at a single institution or group of institutions. Single institution TI grants must engage multiple academic units or disciplines. TI awards also support the work of multiple institutions committed to the implementation of common or related models of undergraduate computing education. All TI projects are expected to include outreach to broader institutional communities as the projects and models mature, including the participation of secondary teachers and students as appropriate within the context of the project.

TI awards will support advanced development and assessment of innovative undergraduate computing education reform within and across higher educational academic institutions. TI grants will support the implementation of innovative, integrative models for undergraduate computing education that have potential to serve as national models. TI projects are expected to:

- Implement innovative, integrative organizational models for undergraduate computing education at one or more institutions;
- Provide new or enhanced programmatic pathways for undergraduate computing education;
- Create sustainable changes in culture and practice within the participating organizations;
- Serve as models and resources for the national computing community;
- Extend already implemented innovative undergraduate computing education models and/or approaches to additional institutions; and
- Evaluate the success and impact of the models being implemented.

TI projects must include a comprehensive evaluation plan involving external evaluators with the expertise to conduct project evaluation and to oversee quasi-experimental evaluation projects as part of a CPATH programmatic evaluation. Funds must be requested for the project evaluator to attend an annual evaluator meeting organized by NSF. Evaluation should comprise at least 10% of the total budget of TI projects. Evaluation of most TI projects will involve contact with students and faculty. For that reason, it

is likely that PIs will need to request and receive Human Subjects Certification from their institutions if their projects are funded.

CPATH is focused on systemic change impacting the nature, delivery, support infrastructure, and administration of undergraduate computing education. Successful TI proposals will fully address organizational as well as curricular issues. There must be a detailed plan for sustainability of the undergraduate computing education model that is the basis for the proposed implementation effort. Funding will reflect active participation from all stakeholders rather than a single academic group. For TI projects, letters of support included in the Supplementary Documents Section of the proposal are required as one method of documenting institutional and community support.

CPATH will fund implementation of innovative models for undergraduate computing education that can serve as sustainable national models. CPATH encourages the development of TI projects that accomplish one or more of the following:

- Produce outcomes that are transportable to varieties of programs and institutions and have a high probability of adoption at a broad range of institutions;
- Foster computational thinking models rather than general computer or information literacy across the undergraduate curriculum;
- Involve community college, industrial, and/or international partnerships;
- Develop innovative models of institutional organization and administration for undergraduate computing education;
- Streamline traditional pathways through undergraduate computer science programs;
- Address global competitiveness issues; and
- Foster faculty collaborations across disciplines and cooperative mechanisms for delivering integrated, interdisciplinary undergraduate computing-centric programs.

Additional information relevant to all CPATH projects:

It is likely that many CPATH projects will have a curricular component. However, strong CPATH proposals will extend well beyond the simple writing of a curriculum and passive dissemination through a web site. The incremental revision of existing courses, such as the introductory computing course sequence, does not satisfy the goals of CPATH. Curricular efforts must be broad and inclusive. They must include active engagement of a community and an ongoing community component. Typically, a CPATH curricular component would be broader than a single course, single workshop, single faculty member, or single institution. While some TI projects may involve a single institution, it is expected that in the final years a significant outreach effort to other institutions or a broader faculty community is included in project plans. Curricular efforts need to be described and justified within the context of other related efforts and the national need for the proposed project.

All CPATH projects must include evaluation and assessment of components that can effectively document both successes and failures. Awardees must set and meet measurable goals and collect evidence to determine progress towards these goals. Awardees must also participate in a CPATH program-level evaluation, and supply common data. CB and CDP type projects must include sound evaluation plans including contracting an individual external to the project but not necessarily the institution with appropriate expertise. TI projects must include external evaluators as described in the TI project description above.

CPATH projects must be well grounded in research and practice. Proposals are expected to include discussion of the intellectual basis of both the education and scientific components of the project, including relevant references and demonstration of awareness of related literature and activities.

CPATH projects are collaborative in nature – either among disciplines within institutions or among multiple institutions or faculty members. It is imperative that proposals demonstrate community support for the activities as well as demonstrate clearly the existence of an active community to be served. Letters of collaborative support engagement included in the Supplementary Documents Section of the proposal are required as one method of documenting community support.

CPATH is focused on undergraduate computing education. The primary goals and activities of any CPATH project must be related to fostering innovative change in undergraduate computing education. CPATH, however, does provide for modest engagement of secondary teachers and students as part of CB or TI projects. Investigators interested in projects dealing with core K-12 education or activities for elementary education might consider other relevant NSF programs to increase their chances of funding. Some NSF programs dealing with outreach and experiences of K-12 students and teachers of particular interest to the CISE community include Broadening Participation in Computing (BPC), Information Technology Experiences for Students and Teachers (ITEST), and NSF Graduate Teaching Fellows in K-12 Education (GK-12).

Many CPATH projects and activities will result in new pathways and opportunities that might attract a broader audience of students and faculty to undergraduate computing programs. CPATH projects must focus on goals related to fundamentally changing the nature of undergraduate education rather than on strategies primarily for recruitment and supporting broadening participating. While these goals may well be a component of CPATH projects, other broader educational goals must dominate. Individuals primarily interested in broadening participation might consider the CISE Broadening Participation in Computing (BPC) program.

III. AWARD INFORMATION

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds. NSF anticipates having \$5M in FY2008 for new awards under this solicitation, pending the availability of funds. CDP projects will be funded from levels of \$50,000 to a maximum of \$150,000 total for up to two years. CB projects will be funded from levels of \$50,000 to a maximum of \$500,000 total for durations up to three years. TI projects will be funded at levels up to \$1,000,000 total for a maximum duration of three years. It is anticipated that 2 to 5 TI projects will be funded in FY 2008.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- Organizational limits differ by CPATH project type as defined below:

For CB projects. GPG eligibility guidelines apply.

For CDP and TI projects. Universities and two- and four-year colleges (including community colleges) located and accredited in the United States, its territories or possessions, or the Commonwealth of Puerto Rico, that award degrees in a field supported by NSF are eligible to apply for CDP and TI awards. Such organizations also are referred to as academic institutions.

CPATH proposals that describe partnerships with other organizations with a stake in undergraduate computing education are strongly encouraged. Partner organizations may include industry, professional societies, and not-for-profit organizations, amongst others.

PI Limit:

At least one individual on the project leadership team (PI or co-PI) must be a member of the community served by CISE.

Limit on Number of Proposals per Organization:

For CDP and TI proposals: an academic institution may submit or participate in no more than one TI and one CDP proposal. There is no organizational limit for CB proposals.

Limit on Number of Proposals per PI: 2

An individual may participate as PI, Co-PI, or Senior Personnel on at most one CDP or TI proposal. An individual may also participate as PI, Co-PI or Senior Personnel on at most one CB proposal.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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

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

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

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. Chapter II, Section D.3 of the Grant Proposal Guide provides additional information on collaborative proposals.

Proposers are reminded that all projects involving human subjects must either (1) have approval from the organization's Institutional Review Board (IRB) before issuance of an NSF award or, (2) must affirm that the IRB or an appropriate knowledgeable authority previously designated by the organization (not the Principal Investigator) has declared the research exempt from IRB review, in accordance with the applicable subsection, as established in section 101(b) of the Common Rule. NSF's Common Rule on Protection of Human Subjects is available on the NSF website at:

<http://www.nsf.gov/bfa/dias/policy/docs/45cfr690.pdf>.

Guidance about the regulation is available at:

<http://www.nsf.gov/bfa/dias/policy/human.jsp>

Additional Instructions for Proposal Preparation.

Proposal Title: To assist NSF staff in sorting proposals for review, proposal titles should begin with the acronym that identifies the type of project proposed. For example: "CPATH TI: Adopting the Distributed Computing Practice Model at Liberal Arts Institutions"; or, "CPATH CB: Developing a Professional Community for Integrated Computing Education".

Project Summary: The project summary should also clearly identify the CPATH project type – CB, CDP, or TI. The project summary must specifically discuss in separate **labeled sections** the **Intellectual Merit** and **Broader Impacts** of the proposed activities, in accordance with the guidelines described in the GPG or the NSF Grants.gov Application Guide. Proposals that fail to do so will be returned without review.

Project Description: The project description instructions for CPATH proposals vary by project type as described below.

The Project Description for **TI** proposals should include the following sections:

Project Vision, Goals, Objectives and Outcomes. Motivated by the CPATH vision articulated in this solicitation, describe the vision, goals, objectives, and anticipated outcomes of the proposed project. The activities described should be clearly informed by relevant research and current knowledge of factors impacting undergraduate computing education.

Intellectual Basis/ Related Work. Describe the intellectual basis of the transformative project and discuss related prior work. Include a brief review of the research literature relevant to the project and corresponding References section within the proposal.

Current State. Provide a current assessment of undergraduate computing education in the relevant participating organizations. Describe any prior pilot programs or planning activities conducted to date, if any, and their outcomes. Describe how the project vision, goals, objectives, and anticipated outcomes are innovative and improvements over existing practices. Where possible, provide institutional data to document the current environment by uploading data into the Supplementary Documents section of the proposal.

Implementation Plan. Describe in detail the activities to be undertaken to realize the project vision, goals, objectives and anticipated outcomes. Identify the targeted undergraduate cohort that will benefit from the project. Describe the potential for the project to contribute to the revitalization of undergraduate computing education on a national scale. Where appropriate, describe current or emerging models and their connection to the project. Describe how organizational change will be effected and sustained. Describe the roles that each partner organization will play in the project. Describe the role of individuals from CISE disciplines in the project.

Management Plan. Using a table, a spreadsheet, or one of the many project management tools that are available provide a management plan for the activities that will take place during the lifetime of the project. The Management Plan should describe project milestones in the context of a project timeline, it should identify responsible parties and expected outcomes for each milestone, and it should be included either as a figure within this section in the proposal or uploaded into the Supplementary Documents section of the proposal.

Project Expertise: Describe the expertise and capacity of the proposing team to carry out the proposed work. Document prior experience in both the disciplinary research areas and educational aspects of the project.

Collaboration Plan. Describe the participating groups or organizations that will work together to realize the project vision, goals, objectives, and outcomes, and the key stakeholders (faculty, students, administrators, industry, professional societies) participating in project planning and implementation. Describe how the proposing team will form, orient, manage, and reinforce team relationships on the project. Provide evidence of the commitment of the participating organizations to the project vision and goals. Letters of collaborative support are required for TI projects and should be uploaded into the Supplementary Documents section of the proposal. Provide evidence of the commitment of the participating institutions to sustain the educational and organizational change effected.

Evaluation Plan. Describe the plan that will inform the project progress and measure its impact. Include a description of the instruments/metrics used to measure, document, and report on the project's progress. Identify the external evaluator who will be responsible for the evaluation component and discuss their expertise related to the evaluation as well as any other linkages to the project or organizations involved.

Dissemination and Outreach Plan. Describe how the project assures that the project results and effectiveness will be disseminated in a broader context and to a larger audience. List relevant publications, conferences, and workshops targeted by dissemination efforts. Describe how organizational models will be disseminated to broad community groups and how project resources will be made available to others to adopt or adapt. Identify proactive measures that will be put in place to find and support adopters of promising models and practices. Describe plans for outreach to other groups or interested institutions that will take place during the project.

- The Project Descriptions for **CB** proposals should include the following sections:

Vision, Goals, Objectives, and Outcomes. Motivated by the CPATH vision articulated in this solicitation, describe the vision, goals, objectives, and anticipated outcomes of the proposed project.

Intellectual Basis/ Related Work. Describe the intellectual basis of the community building project and discuss related prior work. Include a brief review of the research literature relevant to the project and corresponding References section within the proposal.

Implementation Plan. Describe in detail the activities to be undertaken to realize the project vision, goals, objectives and anticipated outcomes. Identify the types of participants likely to engage in the activity (e.g. if a workshop is being proposed, the names of workshop participants need not be identified, but the target audience should be, for example, faculty from local community colleges and undergraduate institutions or local industry leaders). Describe the potential for the project to contribute to the revitalization of undergraduate computing education. Describe the roles that each of the proposing partner organizations will play in the project. Describe approaches to engage individuals from CISE disciplines in the activities, both as leaders and as participants.

Management Plan. Using a table, a spreadsheet, or one of the many project management tools that are available provide a management plan for the activities that will take place during the lifetime of the project. The Management Plan should describe project milestones in the context of a project timeline, it should identify responsible parties and expected outcomes for each milestone, and it may be included as a figure in this section of the proposal or uploaded into the Supplementary Documents section of the proposal.

Project Expertise: Describe the expertise and capacity of the proposing team to carry out the proposed work. Document prior experience in both the disciplinary research areas and educational aspects of the project.

Community Support. Provide evidence of community support for the activity and discuss the plans to develop leaders to sustain and nurture the community. Include letters of support in the Supplementary Documents section of the proposal.

Evaluation Plan. Describe the plan that will inform the project progress and measure its impact. Include a description of the instruments/metrics used to measure, document, and report on the project's progress. Identify the evaluator who will be responsible for the evaluation component and discuss their expertise related to the evaluation as well as any other linkages to the project or organizations involved.

Dissemination Plan. Describe how project results will be disseminated to the community and other relevant groups. List relevant publications, conferences, and workshops targeted by dissemination efforts. Describe how community building models will be disseminated to broad community groups and how project resources will be made available to others. Describe efforts to build the community and involve the community in ongoing dissemination activities and activities to sustain the community.

- The Project Descriptions for CDP proposals should include the following sections:

Project Vision, Goals, Objectives and Outcomes. Motivated by the CPATH vision articulated in this solicitation, describe the vision,

goals, objectives, and anticipated outcomes of the proposed project. The activities described should be clearly informed by relevant research and current knowledge of factors impacting undergraduate computing education.

Intellectual Basis/ Related Work. Describe the intellectual basis of the transformative activities in and discuss related prior work. Include a brief review of the research literature relevant to the project and corresponding References section within the proposal.

Implementation Plan. Describe in detail the planning activities to be undertaken to realize the project vision, goals, objectives and anticipated outcomes. Identify the types of participants likely to engage in the activity (e.g. if a workshop is being proposed, the names of workshop participants need not be identified, but the target audience should be, for example, faculty from local community colleges and undergraduate institutions or local industry leaders). Describe the potential for the project to contribute to the revitalization of undergraduate computing education. Describe the roles that each of the proposing partner organizations will play in the project. Describe approaches to engage individuals from CISE disciplines in the activities, both as leaders and as participants.

Project Expertise: Describe the expertise and capacity of the proposing team to carry out the proposed work. Document prior experience in both the disciplinary research areas and educational aspects of the project.

Institutional/Community Support. Provide evidence of institution and/or community support for the activity. Include letters of support in the Supplementary Documents section. Letters of support should be uploaded into the Supplementary Documents section of the proposal.

Evaluation Plan. Describe the plan that will inform the project progress and measure its impact. Include a description of the instruments/metrics used to measure, document, and report on the project's progress.

Dissemination Plan. Describe how project results will be disseminated to the community and other relevant groups. List relevant publications, conferences, and workshops targeted by dissemination efforts.

B. Budgetary Information

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

Other Budgetary Limitations:

The CPATH program provides funding for activities that include:

- Faculty summer salary and/or release salary;
- Program coordination and clerical support;
- Faculty travel for project coordination and dissemination;
- Workshop costs; and
- Evaluation and assessment costs.

CPATH will not provide funding for large equipment purchases and facilities.

All CPATH project budgets must include funds for at least one PI to attend the annual CPATH PI meeting. All TI projects must include funds for their external evaluator to attend an annual CPATH Evaluators' meeting.

Significant faculty involvement and commitment is essential for all CPATH proposals. This should be reflected in the budget as well as in the project description. CPATH allows at most modest support for graduate students in a supporting role, with a maximum of one graduate student for a CB project and two for TI projects. Faculty should be leading the implementation, instruction, and community engagement aspects of CPATH projects.

C. Due Dates

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

March 11, 2008

D. FastLane/Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

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

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

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

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

be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

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

VI. 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>.

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:

Additional review criteria differ by CPATH project type as described below.

- **TI proposals**

In the context of the Intellectual Merit and Broader Impacts review criteria, reviewers will be asked to consider specifically the following aspects of TI proposals.

Project Vision, Goals, Objectives, and Anticipated Outcomes. Assess the potential of the proposed project and the likelihood that it will contribute in significant ways to realization of the CPATH vision, and to systemic change in undergraduate computing education. Is the project truly innovative and does it have the potential to serve as a national model?

Current State. Evaluate the readiness of the participating organizations to undertake the proposed work. Do the proposers demonstrate a clear understanding of the current state of undergraduate computing education within the nation, within participating organizations, and within the domain of focus for the proposed project. If data are provided, do they support the proposing team's assessment?

Implementation Plan. Evaluate the soundness that the proposed implementation plan and its potential to result in realization of the proposed vision, goals, objectives and milestones for the project. Determine the degree to which individuals from CISE disciplines are engaged in the project, both in the leadership team and in the project as a whole.

Collaboration Plan. Evaluate the proposed collaboration plan and the commitment of the participating organizations to the project vision, goals, objectives and outcomes. Does the collaboration plan give confidence that organizational change necessary to project success will be implemented? Does it have the potential to develop new and sustain new multi-disciplinary computing units within institutions?

Project Expertise. Evaluate the expertise of the project team to carry out the project. Is there sufficient expertise on both the research and the educational aspects?

Institution and Community Support. Evaluate the institutional support for the project. Is there sufficient administrative and infrastructure support for the proposed transformations? Are there letters of support documenting this commitment?

Evaluation and Dissemination Plan. Assess the quality of the proposed evaluation and dissemination activities.

- **CB proposals**

In the context of the Intellectual Merit and Broader Impacts review criteria, reviewers will be asked to comment specifically on the following aspects of CB proposals:

Project Vision, Goals, Objectives, and Anticipated Outcomes. Assess the potential of the proposed project and the likelihood that it will contribute in significant ways to realization of the CPATH vision. Is the project innovative and does it have the potential to develop and sustain new multi-disciplinary computing communities?

Implementation Plan. Evaluate the soundness of the proposed implementation plan and its potential to result in realization of the proposed vision, goals, objectives and outcomes. Assess the degree to which individuals from CISE disciplines will be engaged in the proposed activities.

Project Expertise. Evaluate the expertise of the project team to carry out the project. Is there sufficient expertise on both the research and the educational aspects? Assess the degree to which individuals from CISE disciplines will be engaged in the proposed activities.

Institution and Community Support. Evaluate the community support for the project.

Evaluation and Dissemination Plan. Assess the quality of the proposed evaluation and dissemination activities.

- **CDP proposals**

In the context of the Intellectual Merit and Broader Impacts review criteria, reviewers will be asked to comment specifically on the following aspects of CDP proposals:

Project Vision, Goals, Objectives, and Anticipated Outcomes. Assess the potential of the proposed project and the likelihood that it will contribute in significant ways to realization of the CPATH vision, and to systemic change in undergraduate computing education. Is the vision of the conceptual development and planning activity for projects that are truly innovative and within the CPATH vision? Is planning needed or is there sufficient activity underway that fuller implementation is in order?

Implementation Plan. Evaluate the soundness of the proposed CDP project implementation plan and its potential to result in realization of the proposed vision, goals, objectives and outcomes. Assess the degree to which individuals from CISE disciplines will be engaged in the proposed activities.

Project Expertise. Evaluate the expertise of the project team to carry out the project. Is there sufficient expertise on both the research and the educational aspects? Are all stakeholders integrally involved in the CDP project activities?

Institutional and Community Support. Evaluate the institutional or community support for this CDP activity.

Evaluation and Dissemination Plan. Assess the quality of the proposed evaluation and dissemination activities.

B. Review and Selection Process

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

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

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

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

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

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

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

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

C. Reporting Requirements

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

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.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Harriet Taylor, Program Director, Division of Computer and Network Systems, 1175, telephone: (703) 292-8950, email: htaylor@nsf.gov
- Sol Greenspan, 1108, telephone: (703) 292-8910, email: sgreensp@nsf.gov
- Sylvia Spengler, Program Director, Division of Information and Intelligent Systems, 1125, telephone: (703) 292-8930, email: sspengle@nsf.gov

For questions related to the use of FastLane, contact:

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

For questions relating to Grants.gov contact:

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

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, MyNSF (formerly the Custom News Service) is an information-delivery system 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 or the user's Web browser each time new publications are issued that match their identified interests. MyNSF also is available on NSF's Website at <http://www.nsf.gov/mynsf/>.

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

NSF receives approximately 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.

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

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

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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

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

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

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

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