Software and Tools for High-End Computing (ST-HEC)

Program Solicitation
NSF 04-569

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

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

May 14, 2004
The submission of a letter of intent is strongly encouraged.

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

July 07, 2004

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Software and Tools for High-End Computing (ST-HEC)
NSF/DARPA High-End Computing University Research

Synopsis of Program:

Because of the ever-growing complexity of scientific and engineering problems, computational needs continue to increase rapidly. Breakthrough-quality scientific discoveries and the optimal design of large and complex artifacts impose enormous demands on computing resources and the expertise to utilize them. But most of the currently available hardware, software, systems, and algorithms are primarily focused on business applications or smaller scale scientific and engineering problems, and cannot meet the high-end computing (HEC) needs of cutting-edge scientific and engineering work.

This solicitation is concerned exclusively with high-end software tools for extreme-scale scientific computation, which are highly computation- and data-intensive, and cannot be satisfied in today's typical cluster environment. The target hosts for these tools are systems comprised of thousands to tens of thousands of processors.

The ST-HEC program will support innovative research activities aimed at building complex software and tools (on top of the operating system) for high-end architectures. The topics of interests are:

- Pre-processors and compilers.
- Software tools for dynamic and adaptive computation.
- Software tools for job scheduling and resource management.
- Software tools for debugging and monitoring.
- Programming and software tools for effective locality-aware computing.
- Software tools for adaptive and global memory management.

Cognizant Program Officer(s):

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- Xiaodong Zhang, Program Director, Directorate for Computer & Information Science & Engineering, Division of Computing and Communication Foundations, 1122 S, telephone: (703) 292-8910, fax: (703) 292-9059, email: xzhang@nsf.gov

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

- 47.070 --- Computer and Information Science and Engineering

Eligibility Information

- **Organization Limit:** None Specified.
- **PI Eligibility Limit:** None Specified.
- **Limit on Number of Proposals:** None Specified.

Award Information

- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 10 - awards with cumulative budgets of $500K-$1M for durations of up to 3 years
- **Anticipated Funding Amount:** $7,000,000 of which $6M is provided by NSF and $1M is provided by DARPA., subject to availability of funds.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is optional. Please see the full text of this solicitation for further information.
- **Full Proposal Preparation Instructions:** Standard GPG Guidelines apply.

B. Budgetary Information

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

C. Due Dates

- **Letters of Intent *(optional)*** :

  May 14, 2004

  The submission of a letter of intent is strongly encouraged.
- **Full Proposal Deadline Date(s)** (due by 5 p.m. proposer's local time):

  July 07, 2004

Proposal Review Information

- **Merit Review Criteria:** National Science Board approved criteria apply.

Award Administration Information

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

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I. INTRODUCTION

The way in which scientific and engineering research is conducted has radically changed in the past two decades as simulation and computation are being increasingly used to augment, and in many cases replace, physical experimentation and the construction of prototypes. Complex systems such as proteins, human organs, the atmosphere, and galaxies can be analyzed and better understood through computer models. In many instances, such as astro-physics or climate modeling, computational simulation is the principal method for exploring concepts and ideas. Complex human-made objects such as aircraft and advanced drugs might be better designed through computational optimization and computer-based experimentation and testing. Computation is bound to play an ever more critical role not only in coping with advanced scientific and engineering challenges, but in solving societal and environmental problems and in improving the nation's economic productivity and competitiveness.

Because of the ever-growing complexity of scientific and engineering problems, the computational needs continue to increase rapidly. Breakthrough-quality scientific discoveries and the optimal design of large and complex artifacts impose enormous demands on computing resources and the expertise to utilize them. But most of the currently available hardware, software, systems, and algorithms are primarily focused on business applications or smaller scale scientific and engineering problems, and cannot meet the high-end computing (HEC) needs of cutting-edge scientific and engineering work.

HEC vendors supply a base set of compilers (e.g., Fortran, C, C++) with a HEC system. However, these compilers are developed and optimized for commercial systems and applications, and are typically not optimized for the HEC systems of interest to advanced scientific and engineering work. Moreover, current HEC systems are extremely difficult to program and to port applications to, and consequently applications rarely achieve an acceptable fraction of the peak capability of the system. The development of better programmer tools (e.g., for porting, debugging, scaling) is needed to radically improve this situation, enabling true performance portability to new architectures. These tools must become vastly easier to use, totally seamless (integrated into software development environments), completely cross-platform, and highly efficient when applied to applications running at the full scale of the system.

An interagency "High-End Computing Revitalization Task Force (HECRTF)" assembled by the U.S. National Science and Technology Council in March 2003 sought to determine the nation's high-end computing needs and recommended a "Federal Plan" for work in this area. The HECRTF report (http://www.itrd.gov/hecrtf-outreach/index.html) and the report (http://www.itrd.gov/hecrtf-outreach/20040112_cra_hecrtf_report.pdf) of a workshop commissioned by HECRTF provide detailed "roadmaps" for high-end computing work in hardware, software, systems and algorithms. The reports also contain references to several other recent workshops and studies related to the subject.

Responding to the HECRTF recommendations, an interagency group, presently consisting of NSF, DOE Office of Science, DARPA and NSA, has started a pilot program called High-End Computing University Research Activity (HECURA) to address basic research. The HEC theme chosen for FY 2004 is Software. This solicitation, undertaken jointly with DARPA, supports research and education projects in the area of software tools and compilers for high-end computing. All proposals should be submitted to NSF. All proposals will be merit reviewed using NSF's merit review process. NSF and DARPA will jointly select proposals for award..

II. PROGRAM DESCRIPTION

The High-End Computing Revitalization Task Force (HECRTF) was formed in March 2003 to develop a federal high-end computing plan to ensure that the U.S. undertakes and sustains a robust high-end computing program to maintain U.S. leadership in science and technology. Additional information on HECRTF may be found at http://www.itrd.gov/hecrtf-outreach/index.html.

HECRTF recommended, among other things, a comprehensive technology strategy involving basic research, advanced development, engineering and prototype development, and test and evaluation. The High-End Computing University Research Activity (HECURA) is a funding initiative by several government agencies participating in HECRTF to address the recommended basic research. As indicated above, this program solicitation is part of HECURA designed to specifically support primarily university-based research in the area of software and tools for high-end computing (ST-HEC).

This solicitation is concerned exclusively with high-end software tools for extreme-scale scientific computation, which are highly computation- and data-intensive, and cannot be satisfied in today's typical cluster environment. The target hosts for these tools are systems comprised of thousands to tens of thousands of processors.

The ST-HEC program will support innovative research activities aimed at building complex software and tools (on top of the operating system) for high-end architectures. The topics of interests are:

- Pre-processors and compilers.
- Software tools for dynamic and adaptive computation.
- Software tools for job scheduling and resource management.
- Software tools for debugging and monitoring.
- Programming and software tools for effective locality-aware computing.
- Software tools for adaptive and global memory management.

The objective of the ST-HEC program is to enable high end-computing application developers and users to achieve maximum sustained performance and effectiveness with reduced power consumption and high reliability. Supported areas include but are not limited to:

- **Efficient interactions between applications and systems.** High-end systems are highly complex. As a result, the application programs executing on such systems demand increasingly dynamic and diverse resources. Existing software and tools lack the ability to efficiently handle the interactions and there is therefore a need for tools to enable the efficient interaction between application software and systems. Ideally, such mechanisms would be architecture agnostic to enable users to use these tools from system to system without having to relearn mechanisms. Special cases within this more general area include:

    - **Performance monitoring.** In order to gain insight into dynamic program execution and to closely monitor resource allocations at run-time in high-end systems, powerful and accurate monitoring systems are mandatory. These monitors collect information on program behavior and are used to identify performance bottlenecks. Innovative approaches to performance monitoring for high end computing are sought that also address interfaces and presentation of results to programmers.

    - **Functional debugging.** Debugging any complex software is difficult; debugging the highly complex applications running on high-end computers is especially difficult. Such debugging is used to identify "bugs", fix problem areas, provide insight into performance, etc. Debuggers must address the large numbers of processors involved, distributed file systems, multiple threads spanning multiple processors, etc. Innovative approaches to debugging for high end computing are sought that also address debugging interfaces and the presentation of results to programmers.

- **Exploiting the deep memory hierarchy.** Memory performance continues to be a bottleneck in high-end computing. The high-end community demands effective software support, such as libraries, tools, and compilers, to exploit the memory locality at multiple levels, resulting in improved utilization of global memory resources. The goal of this effort is to narrow the significant existing gap between the peak performance and the sustained performance realized on today's high-end computing systems.

System Scalability and Reliability. High-end systems must be reliably scaled to thousands and tens-of-thousands of processors. Currently available and projected software and tools can only handle moderate size systems and typically do so without any guaranteed reliability. It is therefore necessary to create the necessary tools, libraries and compiler technology to enable users to effectively and transparently exploit the additional computing resources to be made available in tomorrow's high-end computing platforms.

Funded proposals will support multiple-investigator projects within the focused range of research topics described above. Research collaborations are encouraged with industry, non-profit organizations, federal laboratories and Federally Funded Research and Development Centers (FFRDCs), including the DOE National Laboratories. The resulting ST-HEC award portfolio will: advance the high-end computing software research frontier; build national education and workforce capacity (including undergraduate, graduate, and faculty development and training); and impact high-end computing practice.

III. ELIGIBILITY INFORMATION

The categories of proposers identified in the Grant Proposal Guide are eligible to submit proposals under this program announcement/solicitation.

IV. AWARD INFORMATION

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds. NSF anticipates making up to 10 awards with cumulative budgets of $500K-$1M for durations of up to 3 years. Total funding available is approximately $7M of which NSF will provide $6M and DARPA will provide $1M, subject to availability of funds.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent *(optional):*

The submission of a letter of intent is strongly encouraged. Letters of intent help NSF plan for merit review. Letters of intent must be sent via e-mail (hard copy will NOT be accepted) to: ST-HEC@nsf.gov. A letter of intent must include:

- Proposal title, the name of the lead/submitting institution, and the names of any partner organizations.
- Brief description of the research and education project.
- Description of external collaboration and technology at a sufficient level of detail to permit identification of conflicts of interests and to allow potential reviewers to be selected.
- List of project team members, including their full names, e-mail addresses, departmental and institutional affiliations, and roles in the activity.
- List of individuals, with organizational affiliations, who are not members of the proposing team and whose selection as reviewers might constitute a conflict of interest due to involvement in proposal development, thesis supervision, co-publication or authorship, co-PI relations, and other usual conflict of interest relationships.
- List of suggested reviewers, with organizational affiliations, who have the expertise to review the proposal and have no affiliations that would cause conflicts.

Full Proposal Instructions:

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/cgi-bin/getpub?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 the program announcement/solicitation number (04-569) 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.

B. Budgetary Information

Cost Sharing:

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

C. Due Dates

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

Letters of Intent *(optional):*

May 14, 2004
The submission of a letter of intent is strongly encouraged.

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

July 07, 2004

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this announcement/solicitation through the FastLane system. Detailed 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 announcement/solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this announcement/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

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.

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.

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 date of receipt. 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 also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). 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.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/home/grants/grants_gac.htm. 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 is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/cgi-bin/getpub?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.

Special Award Conditions:

PI attendance at annual PI meetings of the HEC URA is required.

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.

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:

- S. Kamal Abdali, Division Director, Directorate for Computer & Information Science & Engineering, Division of Computing and Communication Foundations, 1145 S, telephone: (703) 292-8910, fax: (703) 292-9059, email: kabdali@nsf.gov
- Robert Graybill DARPA/IPTO, 3701 Fairfax Drive, Arlington, VA, 22203-1714, USA telephone: 703-696-2220, email: rgraybill@darpa.mil
- Gregory R. Andrews, Division Director, Directorate for Computer & Information Science & Engineering, Division of Computer and Network Systems, 1160 N, telephone: (703) 292-8950, fax: (703) 292-9010, email: gandrews@nsf.gov
- Sangtae Kim, Division Director, Directorate for Computer & Information Science & Engineering, Division of Shared CyberInfrastructure, 1122 S, fax: (703) 292-9060, email: skim@nsf.gov
- Jose Munoz, Senior Scientific Advisor, Directorate for Computer & Information Science & Engineering, Division of Shared CyberInfrastructure, 1122 S, fax: (703) 292-9060, email: jmunoz@nsf.gov

- Frederica Darema, Senior Science and Technology Advisor, Directorate for Computer & Information Science & Engineering, Division of Computer and Network Systems, 1122 N, telephone: (703) 292-8950, fax: (703) 292-9010, email: fdarema@nsf.gov

- Xiaodong Zhang, Program Director, Directorate for Computer & Information Science & Engineering, Division of Computing and Communication Foundations, 1122 S, telephone: (703) 292-8910, fax: (703) 292-9059, email: xzhang@nsf.gov

For questions related to the use of FastLane, contact:

- Velma Lawson, Program Specialist, Directorate for Computer & Information Science & Engineering, Division of Computing and Communication Foundations, 1145 S, telephone: (703) 292-8910, fax: (703) 292-9059, email: vlawson@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 Custom News Service (http://www.nsf.gov/home/cns/start.htm) 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** (NSF Information Center)**:** (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**

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

  or telephone: (703) 292-7827
- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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

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

OMB control number: 3145-0058.

The National Science Foundation
4201 Wilson Boulevard, Arlington, Virginia 22230, USA
Tel: 703-292-5111, FIRS: 800-877-8339 | TDD: 800-281-8749