NSF Middleware Initiative (NMI)

National Science Foundation
Directorate for Computer and Information Science and Engineering
Division of Shared Cyberinfrastructure

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

May 14, 2004

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

NSF Middleware Initiative (NMI)

Synopsis of Program:

The purpose of the NSF Middleware Initiative (NMI) is to develop, deploy and sustain a set of reusable and expandable middleware functions that benefit many science and engineering applications in a networked environment. Robust middleware services are especially important for enhancing scientific productivity and for facilitating research and education collaborations through sharing of data, instruments, and computing resources. The program encourages open source software development and distribution approaches, as well as the development of necessary middleware standards.

Middleware refers to the software that is common to multiple distributed applications and is built atop the network transport layer and the operating system. Middleware manages interactions between remote resources and hides the underlying complexity so that rapid development of new networked applications is enabled. Middleware services must, hence, provide high levels of usability and robustness on the individual desktop, the enterprise platforms and beyond. Middleware technology also addresses a variety of security and privacy concerns to support resource sharing and collaborations.

Building on the successes of current projects, the FY 2004 NMI solicitation focuses on two areas for future funding: (1) integration of middleware technologies with domain science and engineering applications to create production environments; and (2) development and prototyping of new middleware functions and services. The intended environments for these areas are not tethered exclusively to high-end computing

systems, and may include other platforms such as desktop and enterprise networks, as well as networks of embedded systems.

Cognizant Program Officer(s):

- Kevin L. Thompson, Program Director, Directorate for Computer & Information Science & Engineering, Division of Shared CyberInfrastructure, 1175 N, telephone: (703) 292-8962, fax: (703) 292-9060, email: kthompso@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 or Cooperative Agreement
- **Estimated Number of Awards:** 7 to 14
- **Anticipated Funding Amount:** $10,000,000 subject to the availability of funds in FY 2004.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Full Proposal Preparation Instructions:** This solicitation contains information that supplements the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full text of this solicitation for further information.

B. Budgetary Information

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

C. Due Dates

- **Full Proposal Deadline Date(s)** (due by 5 p.m. proposer's local time):
  May 14, 2004

Proposal Review Information

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

Award Administration Information

- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Standard NSF reporting requirements apply.

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I. INTRODUCTION

Middleware services are a key enabler for distributed applications consisting of multiple interacting processes running in different networked locations. They facilitate access to remote resources, enabling scientists and researchers to collaborate with one another and to share instruments, computing resources, and data sets. Middleware software resides between the applications software and the network transport layer, and offers interfaces and tools that enable ready development of new distributed applications and services. Successful middleware is broadly shared across a wide range of distributed applications, and will be a major component of the national and international cyberinfrastructure, as noted in a recent NSF Advisory Panel report, "Revolutionizing Science and Engineering through Cyberinfrastructure" (www.cise.nsf.gov/sci/reports/toc.cfm). Powerful shared software services, together with customized domain specific software components, will create new capabilities and applications, enhance the productivity and efficiency of investigators, and ultimately revolutionize the conduct of scientific and engineering research and education.

The NMI program began in 2001 with a mission to develop, disseminate, and evaluate middleware software and services for

a range of distributed applications. Core NMI awards have established teams responsible for campus enterprise integration and overall systems integration functions. Collectively, these teams have successfully developed a common middleware architecture as well as a process for integrating middleware components into production releases. The teams have begun to use this process to test, harden, and package middleware software for use in production grid computing services. They have also begun to deploy middleware services in campus environments to enhance security functions and to facilitate research collaborations. Details on the NMI program and software suite releases can be found at the URL: www.nsf-middleware.org.

Building on the successes of the existing projects, this solicitation identifies two focus areas for new projects. The first focus area is middleware service *integration and deployment* to create new production environments that support domain science and engineering applications. The second focus area is *development and prototyping* of new middleware components that may, in future, lead to broad use. Each proposal should clearly identify the focus area to which it is being submitted, as described in the proposal preparation instructions.

II. PROGRAM DESCRIPTION

The two primary focus areas of this announcement are described below:

1. Middleware Integration and Deployment

The first focus area involves middleware integration with specific applications in science and engineering, and deployment in a production environment. Projects in this category will use existing NMI software and/or other middleware technologies to enable new ways of conducting research and/or education in a specific field of science or engineering. While demonstration within specific domain environments is emphasized, the resulting software infrastructure should have additional merits of reusability and possible broader sharing across multiple application domains.

Projects will have the following required characteristics:

- Clear impact on domain science. Projects require cross-disciplinary teaming between computer scientists and scientific specialists in application disciplines.
- Significant production use and associated support must be demonstrated during the lifetime of the award. Projects may target "green field" areas or may enable a new deployment phase built on existing partnerships. Successful proposals will include a clear plan and milestones, and describe metrics to measure progress. Deployment strategies may include, for example, staged introduction of software components or new nodes and sites on a scheduled basis. Plans for operational support of installed software during the term of the project should be described (e.g., maintenance and bug report handling).
- Existing grid and middleware technologies must be leveraged. While it is recognized that middleware and grid services are at an early stage of maturity, sufficiently robust core capabilities are available so that they may be productively harnessed to create new services. PI's must demonstrate in-depth understanding of existing middleware capabilities (as well as limitations) and describe how they will be leveraged (and perhaps enhanced) within the project.
- Adherence to open standards where possible.

Although these awards emphasize service deployment and creation of a production environment, the necessary integration efforts may uncover gaps in the required middleware component capabilities. Hence, limited software development and support activities may be necessary as part of the projects. Projects should also reflect the need for an end-to-end perspective for applications and emphasize, for example, usability, robustness, and security in a multi-domain operational environment. The awards are not restricted to high-end computing projects, and alternative platforms and environments are encouraged.

The teams are encouraged to use open source software whenever possible in their projects. NSF also encourages investigators to explore opportunities for teaming with industry and to consider as a component of such a cooperative activity

utilizing the partner's (commercially available) software or services. NSF also encourages leveraging of existing hardware resources, and procurement of new hardware resources is discouraged.

NSF requests all proposals in this focus area to adopt titles that start with "NMI DEPLOYMENT" together with an identifier for the science or engineering discipline targeted. For example, a proposal to grid-enable a human genome project would start with "NMI DEPLOYMENT (BIO)," thus identifying the relevant NSF directorate of the target scientific field or application.

2. Middleware Development and Prototyping

The second focus area involves the development of new middleware capabilities that can dramatically enhance productivity for researchers and educators, and in some cases create new modes of conducting research. Proposals for this focus area will have the following characteristics:

- Identification of at least one application area in science or engineering and a description of the value of the work in the context of a missing capability required by the domain fields.
- A clear description of the proposed approach in comparison to alternative or existing approaches (including other commercial and research solutions).
- The project plan should include a proof-of-concept demonstration of the key software components within the first eighteen to twenty-four months.
- Tangible metrics used to measure the success of the middleware developed, and the steps necessary to take the software from prototype status to production use.

This activity emphasizes new middleware capabilities which may include, but are not limited to: scalable authentication, authorization, and accounting methods and tools; data acquisition, data management, and metadata definitions; and middleware for integrating instrumentation and on-line grid monitoring. This activity also stresses the importance of shared software and tools that enable adaptive, real-time capabilities to be integrated into new applications. Examples in this area include: real-time processing of signals from multiple sources; coupling physical measurements with simulations to enable real-time control of data acquisition and other parameters; on-demand computing and tightly-integrated use of richly networked computational resources (for example, Teragrid system). The time-constants associated with these dynamic capabilities will depend on the requirements of the application systems.

Significant enhancements to existing middleware components will also be considered as a part of the awards. In such cases, the proposal will also be expected to demonstrate an existing user base and how those users benefit in the work applied to enhancing and hardening the code base.

Strong preference will be shown for efforts that provide near-term benefit in manners consistent with ongoing activities of the NMI Program. Open source software development (including community development efforts) and distribution methods are strongly encouraged.

Finally, the proposed environments are not restricted to high-end computing or Grid environments. We also encourage proposers to develop and enhance middleware for desktop and enterprise networks, and environments with networked embedded nodes and other instruments.

All proposals in this focus area will have titles that begin with "NMI DEVELOPMENT."

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

The limited NSF resources available for this undertaking require a balance between the need to achieve real results through middleware deployment, and further exploratory development of new middleware technologies. It is expected that a larger portion of funds in FY 2004 will be invested in integration and deployment projects.

The NMI program will fund 3-6 middleware integration/deployment projects at up to a maximum total of $1M per year for 2-3 years as Cooperative Agreements, and 4-8 projects supporting middleware development/prototyping projects at $50,000 - $500,000 a year for 2-3 years as standard or continuing grants. **Proposal budgets for middleware integration/deployment projects may not exceed the maximum total of $1 million per year, and proposal budgets for development/ prototyping projects may not exceed the maximum total of $500,000 per year.**

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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.

This information supplements the GPG guidelines.

Proposals must identify the focus area (and the application domain) in the title. Integration and deployment proposal titles must start with "NMI DEPLOYMENT (xxx)," where xxx denotes the relevant NSF Directorate.   The titles of development and prototyping proposals must start with "NMI DEVELOPMENT."

Proposers are reminded to identify the program announcement/solicitation number (04-555) in the program announcement/ solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost Sharing:

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

C. Due Dates

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

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

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: http://www.fastlane.nsf.gov/a1/ newstan.htm. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program 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.

Additional Review Criteria:

Projects in the first focus area (integration and deployment) will be evaluated with careful attention to the following:

- The extent to which the proposed project may have positive impact on the associated domain science.
- The extent to which plans demonstrate significant production use and associated support during the lifetime of the award. Projects may target "green field" areas or a new deployment phase built on existing partnerships. Successful proposals will include a clear plan and milestones, and describe metrics to measure the progress. Deployment strategies may include, for example, staged introduction of software components or new nodes and sites on a scheduled basis. Plans for operational support of installed software during the term of the project should be described (e.g. maintenance and bug report handling).
- The extent to which existing grid and middleware technologies are leveraged. While we recognize that middleware and grid services are at an early stage of maturity, we also believe that enough base capabilities are available so that they may be productively harnessed to create new services. PI's must demonstrate in-depth understanding of existing middleware capabilities (as well as limitations) and describe how they will be leveraged (and perhaps enhanced) within the project.
- The extent of adherence to open standards .

Projects in the second focus area (development and prototyping) will be evaluated with careful attention to the following:

- The extent to which the value of the work is described in the context of a missing capability required by the domain fields.
- Clarity in a comparison of the proposed approach to alternative or existing approaches (including other commercial and research solutions)
- Detail in the project plan including a proof-of-concept demonstration of the key software components within the first eighteen to twenty-four months.
- Tangible metrics described to measure the success of the middleware developed, and the steps necessary to take the software from prototype status to production use.

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 (301) 947-2722 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.

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:

- Kevin L. Thompson, Program Director, Directorate for Computer & Information Science & Engineering, Division of Shared CyberInfrastructure, 1175 N, telephone: (703) 292-8962, fax: (703) 292-9060, email: kthompso@nsf.gov

For questions related to the use of FastLane, contact:

- Priscilla L. Bezdek, Program and Technology Specialist, Directorate for Computer & Information Science & Engineering, Division of Shared CyberInfrastructure, 1175 N, telephone: (703) 292-8962, fax: (703) 292-9060, email: pbezdek@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.

The FY 2004 NMI Program complements several other NSF programs:

- **SEIII -** The Science and Engineering Information Integration and Informatics (SEIII) Program focuses on advancing the state of the art in domain informatics - that is, the application of advanced information technology to science and engineering problems in specific science and engineering domains. Since individual domain informatics projects will have many needs in common - information management tools, data analysis tools, etc. - advancement of such infrastructure tools is central to SEIII. A special emphasis will be placed on domain-specific and general-purpose tools for integrating information from disparate sources. Such integration is a key step of many projects yet is rarely addressed in full generality.
- **ITR** - In FY 2004, the focus for the Information Technology Research (ITR) Program is *ITR for National Priorities.* We encourage the submission of proposals targeting one or more of the following National Priorities:
  - advances in science and engineering;
  - economic prosperity and vibrant civil society; and
  - national and homeland security.

  Particular emphasis is placed on research and education associated with the distributed systems and networks that support the attainment of these national priorities. ITR is an activity that includes all research units at NSF and the Program places particular emphasis on interdisciplinary research projects.

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

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

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

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

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

- **TDD (for the hearing-impaired):**   (703) 292-5090 or (800) 281-8749

- **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

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