ACCELERATING DISCOVERY IN SCIENCE AND ENGINEERING THROUGH PETASCALE SIMULATIONS AND ANALYSIS (PetaApps)

Program Solicitation
NSF 07-559

National Science Foundation

Office of Cyberinfrastructure

Directorate for Computer & Information Science & Engineering

Directorate for Engineering

Directorate for Geosciences
Division of Earth Sciences

Directorate for Mathematical & Physical Sciences

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

July 23, 2007

REVISION NOTES

In furtherance of the President's Management Agenda, NSF has identified programs that will offer proposers the option to utilize Grants.gov to prepare and submit proposals, or will require that proposers utilize Grants.gov to prepare and submit proposals. Grants.gov provides a single Government-wide portal for finding and applying for Federal grants online.

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

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.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

ACCELERATING DISCOVERY IN SCIENCE AND ENGINEERING THROUGH

PETASCALE SIMULATIONS AND ANALYSIS (PetaApps)

Synopsis of Program:

This solicitation seeks proposals to develop the future simulation, optimization and analysis tools that can use petascale computing to advance the frontiers of scientific and engineering research. Proposals are sought from researchers aiming to capitalize on emerging petascale computing architectures, catalyzing progress in science and engineering beyond the current state-of-the-art. NSF's emphasis is on implementation and exploitation of forefront techniques. Proposers must be prepared to demonstrate that they have a science or engineering research problem that requires or can exploit petascale computing capabilities. Proposals from or including junior researchers are encouraged as one of the goals of this solicitation is to build a community capable of using petascale computing.

Cognizant Program Officer(s):

- Abhijit Deshmukh, Program Director, ENG, telephone: (703) 292-7061, email: adeshmuk@nsf.gov
- Daryl Hess, Program Director, MPS, telephone: (703) 292-4942, email: dhess@nsf.gov
- Hans Kaper, Program Director, MPS, telephone: (703) 292-4859, email: hkaper@nsf.gov
- Stephen Meacham, Program Director, OCI, telephone: (703) 292-8970, email: smeacham@nsf.gov
- Eduardo Misawa, Program Director, ENG, telephone: (703) 292-5353, email: emisawa@nsf.gov
- Abani Patra, Program Director, OCI, telephone: (703) 292-8970, email: apatra@nsf.gov
- Celeste Rohlfing, Program Director, MPS, telephone: (703) 292-4962, email: crohlfin@nsf.gov
- Barry Schneider, Program Director, MPS, telephone: (703) 292-7383, email: bschneid@nsf.gov
- Nigel Sharp, Program Director, MPS, telephone: (703) 292-4905, email: nsharp@nsf.gov
- Almadena Chtchelkanova, Program Director, CISE, telephone: (703) 292-8910, email: achtchel@nsf.gov
- Eva Zanzerkia, Program Director, GEO, telephone: (703) 292-8556, email: ezanzerk@nsf.gov

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

- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences
- 47.050 --- Geosciences
- 47.070 --- Computer and Information Science and Engineering
- 47.080 --- Office of Cyberinfrastructure

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 11 to 22

Anticipated Funding Amount: $21,500,000 including anticipated out-year commitments, pending availability of funds

Eligibility Information

Organization Limit:

None Specified

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI: 1

An individual may be the PI in no more than one proposal that responds to this solicitation. There is no limit on the number of proposals with which an individual may be associated in other capacities such as co-PI or other senior personnel.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable
- **Full Proposals:**
  - Full Proposals submitted via FastLane: 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 by NSF.
- **Indirect Cost (F&A) Limitations:** Not Applicable
- **Other Budgetary Limitations:** Not Applicable

C. Due Dates

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

  July 23, 2007

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

How do massive stars explode and produce the heaviest elements in the periodic table? If we could design catalysts atom-by-atom, could we transform industrial synthesis? What strategies might be developed to optimize management of complex infrastructure systems? What kind of language processing can occur in large assemblages of neurons? Can we enable integrated planning and response to natural and man-made disasters that prevent or minimize the loss of life and property? Can we enable full reactive fluid flow, structural, dynamical and thermal simulation of combustion engines? Can we solve large-scale inverse problems leading to product, material, manufacturing process and supply chain synthesis and optimization? What are the thermal and mechanical properties of minerals at the temperatures and pressures encountered in the lower mantle and outer core of the Earth? These are just some of the important questions that researchers wish to answer using state-of-the-art High-Performance Computing (HPC) systems.

By 2011, it is anticipated that researchers will be able to access a rich mix of HPC systems with some capable of delivering sustained performance in excess of one petaflop/s. Trends in HPC architecture are such that, at the highest end, production systems in the next two to three years are expected to consist of tens of thousands to a few hundred thousand processors, with each processor containing multiple cores, each core capable of executing multiple threads, and, often, arithmetic units that

support small vector instructions. These features present a programmer with a number of different ways to exploit different types of parallelism within algorithms. Optimizing performance involves a number of challenges, including discovering and exploiting parallelism within codes and overlapping different types of operations. Multi-level caches, local and remote main memory, intra-nodal and inter-nodal communication networks and parallel I/O interfaces offer an increasingly deep hierarchy of latency within computing systems. In addition, other types of commercial HPC system designs are emerging, including hybrid systems in which general purpose processors are coupled with specialized co-processors, either on-chip or separate.

Several recent developments can simplify the challenge of developing scientific and engineering computer codes that scale to large fractions of leading-edge computing systems. One such development consists of increasingly sophisticated techniques for fine-grained performance analysis that take advantage of improved hardware and software instrumentation. Performance modeling enables an investigator to predict the performance of a well-characterized code on new systems and thus to structure the code so that it is more portable across a range of HPC systems. Another example is the development of more sophisticated compilers that offer simpler programming models; for example, Partitioned Global Address Space compilers, such as Co-Array Fortran, UPC and Titanium, together with their underlying native-mode communications libraries.

An area of innovation is that of algorithm design. New modeling techniques enable researchers to take a more comprehensive view of physical phenomena stretching across disparate length and time scales, including the capability to match details accurately at the scale boundaries. As our ability to simulate multi-scale phenomena increases, in some cases it may become important to include stochastic effects to represent aspects of phenomena at the microscopic scale. Thus there is a need for sophisticated statistical sampling techniques in large-scale scientific computations. New statistical and geometrical techniques have increased our ability to uncover structure in seemingly uncorrelated multi-dimensional data sets. New numerical algorithms can take advantage of petascale computing architectures. Many of these advances are only slowly being included in computationally intensive scientific and engineering research.

This solicitation seeks proposals to develop the future simulation, optimization and analysis tools that can use petascale computing to advance the frontiers of scientific and engineering research.

II. PROGRAM DESCRIPTION

The primary purpose of this solicitation is to support projects that will enable researchers to capitalize on emerging petascale computing architectures and thus catalyze progress in science and engineering beyond the current state-of-the-art. The emphasis is on implementation and exploitation of forefront techniques. Proposals from or including junior researchers are encouraged as one of the goals of this solicitation is to build a community capable of using petascale computing.

Proposers must be prepared to demonstrate that they have a science or engineering research challenge requiring petascale computing and that they have a path to exploiting such computation capabilities effectively. For example, such a path might consist of exploring new ideas for how to scale algorithms and codes from current computing capabilities to the petascale level, for the development of new algorithms and techniques that exploit O(1,000,000) processors and deep memory hierarchies, or for algorithms that require hundreds of terabytes of memory. Research outcomes should demonstrate an ability to solve the science or engineering research challenge identified. It is not necessary that proposals contain a complete plan to answer the science or engineering research question definitively, but PIs should show that they will, by the end of the project, be able to enlist petascale computing to tackle their problem, with a strong expectation of success. The codes developed should have broad impact in a particular research field and should be made freely available under one of the standard forms of open-source licenses.

Proposals are encouraged in the following areas, although work in other areas will also be considered:

- enhancing algorithmic scalability using techniques that better exploit multi-threaded, highly parallel, hierarchical architectures,
- improving and creating data sampling, analysis, and clustering algorithms for massive data sets, including scalable interactive visualization tools,
- developing innovative modeling, simulation or optimization algorithms suitable for petascale systems,
- developing platform-independent software to solve forefront scientific problems on petascale systems,
- optimizing software for specific petascale hardware or predicted “best guess” extrapolations to future hardware,
- exploring innovative computational techniques that were not previously considered viable because of limited hardware capability,
- conducting performance analysis and profiling of software that is heavily used but may never have been analyzed for scalability, bottle-necks, and optimization,
- changing functioning problem solvers by substituting algorithmic implementations known from CS research to scale more effectively to computing systems of very large scale,
- adapting a research code that currently uses MPI on supercomputers, to one or more of Co-Array Fortran, UPC or Titanium, in a form that will be useful for specific petascale problems.

The focus of the proposal may be in any of the following areas:

- Astronomy and Astrophysics
- Chemistry
- Computer Science
- Earth Sciences
- Engineering
- Materials Science
- Mathematics and Statistics
- Physics

It is anticipated that, in each of these areas, only one or two proposals will be funded (up to five in engineering) and that these will be proposals that have a high potential for a strategically important impact in these research areas. Projects that involve computer scientists and computational mathematicians in the development of new algorithms, programming techniques, or HPC software libraries, and that will benefit a broad range of science and engineering disciplines will be welcomed but all proposals should clearly define the scientific or engineering research questions that will be addressable with the petascale software that the proposals intend to develop. Successful proposals in response to this solicitation will describe projects that go beyond the scope and priorities of core programs in computational science and engineering, for example through interdisciplinary collaborations. Investigators should include in their proposals a clearly labeled statement explaining why they believe the proposed work presents a special opportunity for early coding and testing on petascale hardware.

III. AWARD INFORMATION

Estimated program budget, number of awards and average award size/duration are subject to the availability of funds. Proposal budgets should not exceed $2M in size and the requested duration should not exceed five years.

IV. ELIGIBILITY INFORMATION

Organization Limit:

None Specified

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI: 1

An individual may be the PI in no more than one proposal that responds to this solicitation. There is no limit on the number of proposals with which an individual may be associated in other capacities such as co-PI or other senior personnel.

Additional Eligibility Info:

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.

Proposals must include a clearly labeled statement explaining why the investigators believe the proposed work would not be appropriate for existing NSF funding opportunities, including core programs, and a clearly labeled statement explaining why the investigators believe that the proposed work presents a special opportunity for early coding and testing on petascale hardware.

Supplementary Documents

Proposals should include the following sections as Supplementary Documents:

- A list of all organizations involved in the project;
- A single, alphabetically ordered list of all people, in the academic or professional community, who have collaborated with (within the last 48 months), or have been a Ph.D. advisee or advisor of, any of the personnel involved in the proposed project. In this list, please include, next to the name of each conflicted individual, that individual's institution or company and the name of the project member with whom he or she has the conflict of interest. It is not necessary to list, as collaborators, personnel who are employees of an institution or company clearly involved in the project; and,
- Letters of commitment from individuals who are from organizations other than the proposing organization or proposed sub-awardees and who are described in the Project Description as involved in the project in a senior capacity, or from authorized representatives of institutions or organizations collaborating with the lead institution.

B. Budgetary Information

Cost Sharing: Cost sharing is not required by NSF in proposals submitted to the National Science Foundation.

C. Due Dates

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

  July 23, 2007

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 and, if they meet NSF proposal preparation requirements, for review. 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 with the proposer.

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 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:

Additional factors in the evaluation process will include the likelihood of enabling future transformative research, the importance of any products within and/or across scientific fields, the efficiency with which petascale computing will be exploited, and the appropriate use of forefront methods. In addition, reviewers will be asked to evaluate the investigator's statement about why the proposed work would not be appropriate for existing NSF funding opportunities, including core programs.

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 date of receipt. 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 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 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/general_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 *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpm.

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:

- Abhijit Deshmukh, Program Director, ENG, telephone: (703) 292-7061, email: adeshmuk@nsf.gov
- Daryl Hess, Program Director, MPS, telephone: (703) 292-4942, email: dhess@nsf.gov
- Hans Kaper, Program Director, MPS, telephone: (703) 292-4859, email: hkaper@nsf.gov
- Stephen Meacham, Program Director, OCI, telephone: (703) 292-8970, email: smeacham@nsf.gov
- Eduardo Misawa, Program Director, ENG, telephone: (703) 292-5353, email: emisawa@nsf.gov
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- Barry Schneider, Program Director, MPS, telephone: (703) 292-7383, email: bschneid@nsf.gov
- Nigel Sharp, Program Director, MPS, telephone: (703) 292-4905, email: nsharp@nsf.gov
- Almadena Chtchelkanova, Program Director, CISE, telephone: (703) 292-8910, email: achtchel@nsf.gov
- Eva Zanzerkia, Program Director, GEO, telephone: (703) 292-8556, email: ezanzerk@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.
- Priscilla Bezdek, telephone: (703) 292-4537, email: pbezdek@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

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