

INITIATIVE ON SENSING AND IMAGING TECHNOLOGIES FOR MULTI-USE APPLICATIONS

Program Solicitation

NSF 00-106

DIRECTORATE FOR ENGINEERING

DEADLINE(S) : September 15, 2000
 5:00 PM your local time



NATIONAL SCIENCE FOUNDATION



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SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

Program Title: INITIATIVE ON SENSING AND IMAGING TECHNOLOGIES FOR MULTI-USE APPLICATIONS

Synopsis of Program: The Engineering Directorate of the National Science Foundation (NSF) announces an Initiative on Sensing and Imaging Technologies for Multi-use Applications. This focused initiative seeks high risk/high return studies involving the application of sensing/imaging technologies to health monitoring, surface and subsurface monitoring, process control and transport phenomena, and distributed sensing and control. Several other NSF directorates also support research on sensors.

Cognizant Program Officer(s):

- Leon Esterowitz, Program Director, Engineering, Bioengineering and Environmental Systems, 565, telephone: 703-306-1318, e-mail: lesterow@nsf.gov.
- Sohi Rastegar, Program Director, Engineering, Bioengineering and Environmental Systems, 565, telephone: 703-306-1318, e-mail: srastega@nsf.gov.
- Fil Bartoli, Program Director, Engineering, Electrical and Communications Systems, 675, telephone: 703-306-1339, e-mail: fbartoli@nsf.gov.
- Lawrence Goldberg, Program Director, Engineering, Electrical and Communications Systems, 675, telephone: 703-306-1339, e-mail: lgolber@nsf.gov.
- Rajinder Khosla, Program Director, Engineering, Electrical and Communications Systems, 675, telephone: 703-306-1339, e-mail: rkhosla@nsf.gov.
- George Hazelrigg, Program Director, Engineering, Design, Manufacture, and Industrial Innovation, 550/590, telephone: 703- 306-1330, e-mail: ghazelri@nsf.gov.
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- Robert Wellek, Deputy Division Director, Engineering, Chemical and Transport Systems, 525, telephone: 703-306-1371, e-mail: rwellek@nsf.gov.
- Theresa Maldonado, Program Director, Engineering, Engineering Education and Centers, 585, telephone: 703- 306-1380, e-mail: tmaldona@nsf.gov.

Applicable Catalog of Federal Domestic Assistance (CFDA) Number:

- 47.041 --- Engineering

ELIGIBILITY INFORMATION

- **Organization Limit:** Proposals may be submitted by U.S. academic institutions and nonprofit research institutions in support of individual investigators or small groups.
- **PI Eligibility Limit:** Only one proposal may be submitted by a Principal Investigator. A Principal Investigator for one proposal may be a co-Principal Investigator on one other proposal.
- **Limit on Number of Proposals:** None

AWARD INFORMATION

- **Anticipated Type of Award:** Standard Grant
- **Estimated Number of Awards:** 8
- **Anticipated Funding Amount:** \$3.75M in FY 2001 subject to availability of funds

PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Guidelines

- **Proposal Preparation Instructions:** Standard Preparation Guidelines
 - Standard GPG Guidelines apply.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required
- **Indirect Cost (F&A) Limitations:** none
- **Other Budgetary Limitations:** Total award amount for three years up to \$600,000 for proposals submitted in response to this solicitation

C. Deadline/Target Dates

- **Letter of Intent Due Date(s):** None
- **Preproposal Due Date(s):** None
- **Full Proposal Due Date(s):**

September 15, 2000

5:00 PM your local time

D. FastLane Requirements

- **FastLane Submission:** Full Proposal Required
- **FastLane Contact(s):**
 - Marcia A. Rawlings, telephone: 703-306-1318, e-mail: mrawling@nsf.gov.

PROPOSAL REVIEW INFORMATION

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

AWARD ADMINISTRATION INFORMATION

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

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I. INTRODUCTION

Sensors have been used in the closed-loop control of engineering systems at least as far back as Watt and the steam engine. But over the past 20 years there has been a revolution in sensing capability. Today, it is possible to sense phenomena in near real-time, such as pathogens and toxins, that could not have been detected even ten years ago. Furthermore the emergence of MEMS (micro-electro-mechanical systems) and nanoscale sensors is decreasing the size, weight and cost of sensors and sensor arrays by orders of magnitude, while at the same time improving their spatial and temporal resolution and increasing accuracy. Thus, in systems that previously were limited to one or a few sensors, emerging technologies make it possible to conceive of millions of sensors integrated into systems to improve their performance, increase their lifetime, make them more flexible in use, and decrease their life cycle costs.

The purpose of all sensors is to gather data regarding the physical world that will, in some way, be used to effect control of a system. Some sensors and imaging devices are used merely to provide data for human interpretation and intervention. Others, however, are integrated into closed-loop control systems that function largely in the absence of human intervention. Examples of the former include medical tests. Examples of the latter include automotive fuel injection systems and airplane autopilots. Most current closed-loop control systems use only a few sensors. Data obtained by the sensors are processed into control information that is used to provide actuation that controls the system. But as sensors become orders of magnitude smaller, lighter and less expensive, it is clearly advantageous to increase the number of sensors used in systems.

As sensors become omnipresent, it is increasingly desirable to incorporate them into systems in ways that often expose them to hostile environments. Automotive sensors, for example, must live in the environment of the engine compartment, where temperatures can exceed 200 C. The integration of sensors with electronics, further complicates the issue of hostile environments. In products and manufacturing systems, environments that include high temperatures, high vibration, high noise, corrosive chemicals and other insults impede the implementation of sensors. In biological systems, the sensors themselves must not adversely affect the system or organism, and they are subject to biofouling and other in-use problems. The technology for sensing and control now has the potential for significant advances, with profound benefits for society. But considerable technological development is needed to realize this potential.

The interest in new sensing and imaging technologies and critical applications for these technologies is ubiquitous across all of the Engineering Directorate's Divisions. Each Division not only has unmet sensing and detection needs, but also supports a diverse set of new technologies that were virtually unknown five years ago and that can be applied to the solution of critical problems. The time is ripe to accelerate the convergence of these multidisciplinary engineering technologies for the solution of major environmental, medical, and infrastructure problems. This initiative is supported by all of the Engineering Directorate's Divisions. It seeks multidisciplinary research on novel information acquisition technologies and novel materials for sensing applicable to a specific critical need or to a broad range of potential applications. Among the newer technologies that are of interest are:

- Nanoscale materials and MEMS, particularly chip-based sensors

- New wireless development technologies, e.g., optical interconnects and microwave photonics
- Subsurface detection methodologies, e.g., confocal and multi-photon microscopy and terahertz imaging
- Use of biomolecular techniques such as DNA arrays, fluorescent proteins, and biological self-assembly for nanoscale engineering
- Phase-conjugate acoustic wave imaging, particularly as a noise reduction technique

Examples of critical unmet needs we are particularly interested in are:

- Major reductions in the size, weight, and cost of sensors/imagers, e.g., portable field sensing systems.
- Major improvements in spatial and temporal resolution, dynamic range, and sensitivity of sensors/imagers
- Robust sensors/imagers for hostile environments, e.g., within engines and plant waste streams.
- Development of implanted and/or minimally invasive sensors/imagers compatible with the human organism
- Integration of state-of-the-art sensors/imagers with control and actuation

II. PROGRAM DESCRIPTION

Proposals are sought under this announcement that seek to obtain major advances in the state-of-the-art of sensing and imaging technologies with the goal of creating advances of significant benefit to society. It is envisioned that research will be carried out in small, multi-disciplinary groups, with the objective of generating new concepts and approaches that are stimulated from the interaction of diverse disciplines. Concepts that amalgamate and integrate novel sensing/imaging technologies with feedback control and actuation are encouraged. Novel stand-alone sensing/imaging concepts and breakthrough ideas are also encouraged. It is important that the research programs on advanced sensing concepts identify and address target applications. Proposals offering incremental advances to current technology are discouraged. This initiative will entertain proposals that leverage other NSF programs and initiatives through which novel sensor technologies (e.g. MEMS based sensors, nanosensors, and chip-based sensors) are being developed. A specific intent of this proposal is to integrate the technologies and varied needs of all the Engineering Divisions (including several Center programs) in a focused program on sensors and to accelerate progress in that area.

TOPICAL AREAS

This initiative will provide research support under four topical areas as follows. It is intended that these areas be broadly defined. Examples are provided to explore the breadth of each topic and are not intended to be all-inclusive.

Health Monitoring - Health monitoring includes sensing and imaging techniques relating to the health of biological and engineered systems. The former includes non-invasive and minimally invasive sensing for medical diagnostics, sensing for research on biological organisms, sensing of the environment including the identification of pathogens and toxins, and the sensing of other phenomena relating to biological organisms. In civil structures, it includes monitoring the health of buildings, roads and bridges, through distributed sensing, feedback, and data analysis. Within buildings, it includes sensing for environmental control. In products and manufacturing systems, it includes monitoring for structural integrity, wear, fatigue, degradation and incipient failure.

Surface and Subsurface Monitoring - In biological organisms, this topic includes detection of cellular and sub-cellular abnormalities. In manufacturing, it includes inspection of electronic structures and circuits, metrology, surface finish monitoring, tolerance measurement and control. In civil infrastructure systems, it includes inspection of underground utility distribution systems for water, sewage, gas, oil, and electric power. It also includes detection of buried features and hazards.

Process Control and Transport Phenomena – Process and reaction engineering as well as separation and purification investigations would receive significant benefits from improvements in a wide range of sensors for basic measurements of temperature, pressure, velocity, and species concentrations that support the chemical process industry. Similarly, the enhanced ability to measure the fundamental (i.e. space and time resolved) kinematic quantities of velocity/vorticity/strain-rate, and the dynamic quantities of wall shear stress and pressure, as well as the scalar variables of temperature and concentration would add significantly to our understanding of basic transport processes. Novel biosensors are desired for applications in chemical kinetics and catalysis. In addition the development of noninvasive sensors that function in the small spatial (nano) and temporal (femto) regions such as of femto-second lasers would have important applications for displays, and cleaning of surfaces (e.g. altering the surface morphology of silicon substrates).

Distributed Sensing and Control - This topic area includes the application of large numbers of sensors in a system to effect determination of the state of the system and its ultimate intelligent control. It includes array and distributed sensors, such as fiber-optic sensors that provide a continuum of sensing along their lengths, and the widespread use of MEMS sensors within a system. It also includes the algorithms needed for the processing of data and the role of data-mining/visualization techniques and sensor fusion for the rapid interpretation of large data sets generated by sensor arrays.

III. ELIGIBILITY INFORMATION

Proposals may be submitted by U.S. academic institutions and nonprofit research institutions in support of individual investigators or small groups. Synergistic collaboration among researchers and collaboration or partnerships with industry or government laboratories is encouraged when appropriate; however, NSF awards will be made to U.S. academic institutions and nonprofit research institutions. Only one proposal may be submitted by a Principal Investigator. However, a Principal Investigator for one proposal may be a co-Principal Investigator on one other proposal. Group and collaborative proposals involving more than one institution must be submitted as a single administrative package from one of the institutions involved. Due to the

limited availability of funds, prospective applicants are strongly urged to contact [one of] the program officer[s] listed at the end of this document for guidance.

IV. AWARD INFORMATION

NSF anticipates that \$3.75M will be available in FY 2001 for this initiative. NSF anticipates funding awards for up to 3-year duration that will range for a cumulative total between \$200,000 - \$600,000. The final number of awards will be subject to the availability of funds and the quality of the proposals.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation 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) (NSF 00-2). The complete text of the GPG (including electronic forms) is available electronically on the NSF Web Site at: <http://www.nsf.gov/pubs/2000/nsf002/start.htm>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (301) 947-2722 or by e-mail from pubs@nsf.gov.

Proposers are reminded to identify the program announcement/solicitation number (NSF 00-106) in the program announcement/solicitation block on the NSF Form 1207, *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 is not required in proposals submitted under this Program Solicitation .

Indirect Cost (F&A) Limitations: none

Other Budgetary Limitations: Total award amount for three years up to \$600,000 for proposals submitted in response to this solicitation

C. Deadline/Target Dates

Proposals submitted in response to this announcement must be submitted by 5:00 PM, local time on the following date(s):

September 15, 2000

5:00 PM your local time

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this Program 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 1-800-673-6188.

Submission of Signed Cover Sheets. The signed copy of the proposal Cover Sheet (NSF Form 1207) must be postmarked (or contain a legible proof of mailing date assigned by the carrier) within five working days following proposal submission and be forwarded to the following address:

National Science Foundation
DIS – FastLane Cover Sheet
4201 Wilson Blvd.
Arlington, VA 22230

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.

Proposals will be reviewed against the following general review criteria established by the National Science Board. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Each reviewer will be asked to address only those that are relevant to the proposal and for which he/she 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?

Principal Investigators should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to both of the above-described NSF merit review criteria. NSF staff will give these elements careful consideration 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.

A summary rating and accompanying narrative will be completed and signed by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are mailed 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.

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 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.

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

NSF will be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 95 percent of proposals. The time interval begins on the proposal deadline or target date or from the date of receipt, if deadlines or target dates are not used by the program. 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 its 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 NSF brochure, program guide, 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 web site 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, (NSF 95-26) available electronically on the NSF web site 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 web site 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. Approximately 30 days before expiration, NSF will send a notice to remind the PI of the requirement to file the final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

NSF has implemented an electronic project reporting system, available through FastLane. 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 should be made to the INITIATIVE ON SENSING AND IMAGING TECHNOLOGIES FOR MULTI-USE APPLICATIONS Program:

- Leon Esterowitz, Program Director, Engineering, Bioengineering and Environmental Systems, 565, telephone: 703-306-1318, e-mail: lesterow@nsf.gov.
- Sohi Rastegar, Program Director, Engineering, Bioengineering and Environmental Systems, 565, telephone: 703-306-1318, e-mail: srastega@nsf.gov.
- Fil Bartoli, Program Director, Engineering, Electrical and Communications Systems, 675, telephone: 703-306-1339, e-mail: fbartoli@nsf.gov.
- Lawrence Goldberg, Program Director, Engineering, Electrical and Communications Systems, 675, telephone: 703-306-1339, e-mail: lgoldber@nsf.gov.
- Rajinder Khosla, Program Director, Engineering, Electrical and Communications Systems, 675, telephone: 703-306-1339, e-mail: rkhosla@nsf.gov.
- George Hazelrigg, Program Director, Engineering, Design, Manufacture, and Industrial Innovation, 550/590, telephone: 703- 306-1330, e-mail: ghazelri@nsf.gov.
- Alison Flatau, Program Director, Engineering, Civil and Mechanical Systems, 545, telephone: 703-306-1360, e-mail: aflatau@nsf.gov.
- Robert Wellek, Deputy Division Director, Engineering, Chemical and Transport Systems, 525, telephone: 703-306-1371, e-mail: rwellek@nsf.gov.

- Theresa Maldonado, Program Director, Engineering, Engineering Education and Centers, 585, telephone: 703- 306-1380, e-mail: tmaldona@nsf.gov.

For questions related to the use of FastLane, contact, Marcia A. Rawlings, telephone: 703-306-1318, e-mail: mrawling@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 listed in Appendix A of the GPG. 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 web site 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 (unless otherwise specified in the eligibility requirements for a particular program).

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) 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 program announcement/solicitation or contact the program coordinator at (703) 306-1636.

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) 306-0090, FIRS at 1-800-877-8339.

The National Science Foundation is committed to making all of the information we publish easy to understand. If you have a suggestion about how to improve the clarity of this document or other NSF-published materials, please contact us at plainlanguage@nsf.gov.

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.

Pursuant to 5 CFR 1320.5(b), 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, Information Dissemination Branch, Division of Administrative Services, National Science Foundation, Arlington, VA 22230, or to Office of Information and Regulatory Affairs of OMB, Attention: Desk Officer for National Science Foundation (3145-0058), 725 - 17th Street, N.W. Room 10235, Washington, D.C. 20503.

OMB control number: 3145-0058.