Science of Design (SoD)

Program Solicitation
NSF 04-552

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

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

May 19, 2004

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Science of Design (SoD)
Software-Intensive Systems

Synopsis of Program:

The goal of this solicitation is to stimulate research and education projects that build the Science of Design. This solicitation focuses on the scientific study of the design of software-intensive systems that perform computing, communications and information processing. Complex interdependencies strain our ability to create, maintain, comprehend and control these systems. The Science of Design seeks to rectify this situation by building a foundation for the systematic creation of software-intensive systems. This foundation will consist of a body of theoretical and empirical knowledge on design, computational methods and tools for design, and new design curriculum for the next generation of designers.

Topics that are relevant to the Science of Design solicitation include: formal theories and computational methods for the representation, synthesis, and evaluation of designs and requirements; design processes supporting compositionality, maintainability, adaptability and evolution; the role of requirements and specifications in design; computer-aided design for software-intensive systems; studies of designs, designers and design methodologies; development of design education and the integration of knowledge about design methodologies into educational curriculum and training for computer scientists, software engineers and systems engineers.

Cognizant Program Officer(s):

- Sol Greenspan, Program Director, Directorate for Computer & Information Science & Engineering, Division of Computing and Communication Foundations, 1145 S, telephone: (703) 292-8910, fax: (703) 292-9059, email: sgreensp@nsf.gov

- Gregory R. Andrews, Division Director, Directorate for Computer & Information Science & Engineering, Division of Computer and Network Systems, 1160 N, telephone: (703) 292-8950, fax: (703) 292-9010, email: gandrews@nsf.gov

- Maria Zemankova, Program Director, Directorate for Computer & Information Science & Engineering, Division of Information and Intelligent Systems, 1115 N, telephone: (703) 292-8918, fax: (703) 292-9073, email: mzemanko@nsf.gov

- 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

- Charmain Woods, Senior Program Assistant, Directorate for Computer & Information Science & Engineering, Division of Computing and Communication Foundations, 1145 S, telephone: (703) 292-8910, fax: (703) 292-9059, email: cwoods@nsf.gov

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

- 47.070 --- Computer and Information Science and Engineering

Eligibility Information

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

Award Information

- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 15 to 25 - collaborative and/or single investigator projects
- **Anticipated Funding Amount:** $10,000,000 in FY 2004 pending the availability of funds

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

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

B. Budgetary Information

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

C. Due Dates

- **Full Proposal Deadline Date(s)** (due by 5 p.m. proposer's local time):
  May 19, 2004

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

Design is at the core of many professions, including engineering, computer science, architecture, medicine, economics and biotechnology. As we move forward into a world in which the number of devices, amount of software and degree of connectivity in complex systems will all increase by orders of magnitude, it is essential that we have a Science of Design on which to base our efforts at building such systems.

Although many fields may benefit from the Science of Design, this solicitation focuses on design for software-intensive systems. Software-intensive systems include the Internet, large-scale heterogeneous distributed systems, systems for the power grid, avionics and automotive applications, information management systems, etc. These systems pervade business, government, industry, public utilities, health care, the environment and consumer products. The scope, scale and complexity of these systems continue to increase faster than our ability to design them to meet our requirements. The requirements are rarely complete and the true potential of software-intensive systems is often not realized or understood in the first release of a system. Moreover, these systems are difficult to maintain and adapt to additional requirements.

Some of the challenging questions for Science of Design research are: How can we explain, predict and control emergent properties of software-intensive systems? To what extent can we systematize guidance that leads to systems that satisfy requirements? How can we understand and control systems that are developed or assembled from diverse components and large amounts of data that are independently created, managed, and updated, without any central planning or authority? How can we develop theories that rely on aggregate reasoning about overall behavior rather than exact reasoning about all the details? How can we consider the costs and benefits of both the designed artifact and the design process?

The goal of this Science of Design solicitation is to develop a set of scientific principles to guide the design of software-intensive systems. In fields more mature than computer science, design methodology has traditionally relied heavily on constructs such as languages and notational conventions, modularity principles, composition rules, methodical decision procedures and handbooks of codified experience. Such an approach to design is practiced in fields such as architecture and civil engineering. However, the design of software-intensive systems is more often done using rough guidelines, intuition and experiential knowledge. There is a fundamental need to create a scientific foundation for the design of these systems. There is a need to identify design principles, to be able to draw conclusions with confidence about systems designed according to these principles, and to understand the limitations of these principles. These principles, and the body of scientific knowledge that backs them up, should be intellectually sound, formalized whenever appropriate, empirically validated, and teachable to students and practitioners.

The long-term goal for activities funded under this solicitation is to raise the level of engineering practice for software-intensive systems. Ten years from now, the design, construction, testing, commissioning, and modification of complex, software-intensive systems should be based on a coherent, systematic body of scientific knowledge and rationalized experience. At that time, the level of engineering certainty of software-intensive systems should approach that of other engineering disciplines, such as civil or chemical.

II. PROGRAM DESCRIPTION

The Science of Design program seeks proposals that: 1) build the scientific foundations of the Science of Design, 2) investigate and evaluate approaches to education and training for researchers and designers of software-intensive systems, and 3) create innovative methods and new tools that will improve the practice of designing software-intensive systems and/or the education of programmers and other designers. Proposals responsive to this solicitation will address and integrate some of these three concerns.

This solicitation seeks contributions to the science underlying design. It does not seek designs of particular systems or architectures. Because design is important to many CISE programs, some proposals involving the design of specific systems (or types of systems), rather than scientific inquiry into the nature of design, will be more appropriate for submission to other CISE programs, for example, if they focus on issues specific to embedded, trusted, data-intensive or networked systems.

Research Areas

The following research topics are illustrative of the projects encouraged by this solicitation. Proposals are also welcome on

other topics whose relevance is clearly articulated. It is likely that projects will combine elements of several topical areas.

- **Design theory** – theories underlying design representation, reasoning, analysis, decision-making, and synthesis; investigations of design structures and principles supporting composition and adaptability; design languages and modeling frameworks; guidelines for partitioning large tasks into parts; the influence of structure on correctness, reliability, robustness, adaptability, etc.; formalisms for designing under incomplete and unreliable information; semantics for integration of data and computation; theories for combining software and non-software components.

- **Design process** – the development of organized approaches to design that can become highly systematic (i.e., predictable and repeatable) while enabling and facilitating creativity and innovation; the support for rapid exploration and evaluation of design alternatives; the incorporation of guidance according to values such as cost, benefit, risk, and opportunity; the formalization and mechanization of design processes; the alternatives to traditional life-cycle models, such as evolutionary approaches and open source models; the complexities that arise from having people in the loop both as designers and users of software intensive systems.

- **Requirements and specifications** – understanding and framing problems; capturing requirements and specifications; deriving specifications from requirements; designing from specifications; modeling of system environments and domain knowledge; reasoning techniques to explore trade-offs between multiple, conflicting requirements; combining technical requirements of computing, communications and information processing with consideration of economic, social, and aesthetic values; instrumenting design processes for decision support and traceability.
- **Adaptability and evolution** – achieving systems that can be rapidly changed, that can manage themselves, that can adapt in response to changes to their environments, requirements, operating conditions, technology changes, the availability of new data or processing resources, etc.; designing for augmentation of “legacy” systems; making design knowledge available to runtime behavior and operation; empirically-based understanding of evolutionary design phenomenology; maintaining stability and other properties.
- **Design automation and computer-aided design** – formalization of design structures, processes, and knowledge for tool support; problem-solving to enable computer support for design; automation of design tasks e.g. generation and evaluation of candidate designs, program synthesis and generation, automatic refinement and assembly; domain-specific language mechanisms integrated with design tasks and goals; software for mechanized assistance to program composition; validation of correctness of design tools; model-driven design.
- **Quality and productivity** – techniques, methods and tools that improve quality of systems or reduce human effort in designing systems; techniques and tools for modeling, analyzing, simulating, comprehending, predicting and/or quantifying behavior and properties of systems at all stages of design; estimating potential failures, planning for systems that degrade gracefully under stress and can adapt to change.

Research activities

The following are illustrations of research activities that might be incorporated into a project:

- **Empirical studies of designs, designers and design processes** – observation, analysis, experimentation, and evaluation of existing software-intensive systems and their lifecycles; study of exemplary designs and design processes; creation of test beds for design research; study of design assumptions and expected vs. actual outcomes; novel research methodologies for empirical design research.
- **Integrated research and education** – development and codification of design knowledge, e.g., principles, experience, guidance, and problem-solving processes; formulation of teachable design knowledge, experience and best practices; integration of design knowledge into education and training for designers of complex software-intensive systems.
- **Adoption and adaptation of design ideas from other design disciplines** – investigating the applicability for software-intensive systems of methods from other fields such as automation for VLSI/MEMS, architecture, civil engineering, engineering design, and systems engineering.
- **Design environments for specific communities** – creation and/or study of design environments supporting a specific community, for example: 1) scientists who share software systems, applications, and data; 2) students,

educators and developers of educational technology; 3) participants in an enterprise developing customizable systems or product families.

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

NSF anticipates making 15 to 25 awards in FY 2004 as standard or continuing grants for collaborative and/or single investigator projects. Awards funded under this solicitation are anticipated to range from $100,000 per year to $300,000 per year for three to five years. The anticipated funding amount in FY 2004 is approximately $10 million, subject to the availability of funds.

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.

Proposers are reminded to identify the program announcement/solicitation number (04-552) in the program announcement/ solicitation block on the NSF *Cover Sheet For Proposal to the National Science Foundation*. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost Sharing:

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

C. Due Dates

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

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.

B. Review Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by Ad Hoc and/or panel review.

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

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

NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the date of receipt. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the

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

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

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

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1); * or Federal Demonstration Partnership (FDP) Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/home/grants/grants_gac.htm. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/cgi-bin/getpub?gpm. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Website at http://www.gpo.gov.

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:

- Sol Greenspan, Program Director, Directorate for Computer & Information Science & Engineering, Division of Computing and Communication Foundations, 1145 S, telephone: (703) 292-8910, fax: (703) 292-9059, email: sgreensp@nsf.gov
- Gregory R. Andrews, Division Director, Directorate for Computer & Information Science & Engineering, Division of Computer and Network Systems, 1160 N, telephone: (703) 292-8950, fax: (703) 292-9010, email: gandrews@nsf.gov
- Maria Zemankova, Program Director, Directorate for Computer & Information Science & Engineering, Division of Information and Intelligent Systems, 1115 N, telephone: (703) 292-8918, fax: (703) 292-9073, email: mzemanko@nsf.gov
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- Charmain Woods, Senior Program Assistant, Directorate for Computer & Information Science & Engineering, Division of Computing and Communication Foundations, 1145 S, telephone: (703) 292-8910, fax: (703) 292-9059, email: cwoods@nsf.gov

For questions related to the use of FastLane, contact:

- Velma Lawson, Program Specialist, Directorate for Computer & Information Science & Engineering, Division of Computing and Communication Foundations, 1145 S, telephone: (703) 292-8910, fax: (703) 292-9059, email: vlawson@nsf.gov

IX. OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at http://www.nsf.gov/cgi-bin/getpub?gp. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF E-Bulletin, which is updated daily on the NSF Website at http://www.nsf.gov/home/ebulletin, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's Custom News Service (http://www.nsf.gov/home/cns/start.htm) to be notified of new funding opportunities that become available.

Design is an explicit concern in many CISE programs, including those listed, and possibly others. Proposals that are about a

particular type of system or system architecture, or about design issues specific to one of the other programs, should strongly consider submitting to those programs. Proposals should be submitted to the Science of Design solicitation if they are believe to contribute to a Science of Design.

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

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

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

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
- **For General Information** (NSF Information Center)**:** (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090 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

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

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

OMB control number: 3145-0058.