

# Collaborative Large-Scale Engineering Analysis Network for Environmental Research (CLEANER): An Engineering Cyberinfrastructure "Test Bed" (CLEANER)

---

## Program Solicitation

NSF 03-607



### National Science Foundation

Directorate for Engineering

Division of Bioengineering and Environmental Systems

Division of Civil and Mechanical Systems

Division of Chemical and Transport Systems

Division of Electrical and Communications Systems

Division of Design, Manufacture and Industrial Innovation

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

January 07, 2004

---

## SUMMARY OF PROGRAM REQUIREMENTS

---

### General Information

#### Program Title:

Collaborative Large-Scale Engineering Analysis Network for Environmental Research (CLEANER): An Engineering Cyberinfrastructure "Test Bed" (CLEANER)

#### Synopsis of Program:

Through planning grants, the NSF Directorate for Engineering is exploring "Concept Development" of a new cyberinfrastructure project. This new research focus centers on a **network** of "Environmental Field Facilities", which would constitute a "Collaborative Large-scale **Engineering Analysis Network (EAN) for Environmental Research (CLEANER)**". The goal of **CLEANER** is to advance knowledge and integrated assessment modeling of complex environmental systems, thereby enabling more effective approaches to adaptive management. **CLEANER** will provide the capability for near-real time dynamic monitoring and analysis of key parameters for effective environmental management. (See <http://cleaner.ce.berkeley.edu>)

#### Cognizant Program Officer(s):

- Nicholas L. Clesceri, Program Director, Directorate for Engineering, Division of Bioengineering & Environmental Systems, 565 S, telephone: (703) 292-7940, fax: (703) 292-9098, email: [nclescer@nsf.gov](mailto:nclescer@nsf.gov)

- Richard J. Fragaszy, Program Director, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-8360, email: [rfragasz@nsf.gov](mailto:rfragasz@nsf.gov)
- Thomas W. Chapman, Program Director, Directorate for Engineering, Division of Chemical & Transport Systems, 525 N, telephone: (703) 292-8370, fax: (703) 292-9054, email: [tchapman@nsf.gov](mailto:tchapman@nsf.gov)
- Delcie R. Durham, Program Director, Directorate for Engineering, Division of Design, Manufacture, & Industrial Innovation, 550 S, telephone: (703) 292-7060, fax: (703) 292-9056, email: [ddurham@nsf.gov](mailto:ddurham@nsf.gov)
- Paul J. Werbos, Program Director, Directorate for Engineering, Division of Electrical & Communications Systems, 675 S, telephone: (703) 292-8339, fax: (703) 292-9147, email: [pwerbos@nsf.gov](mailto:pwerbos@nsf.gov)
- Tapan K. Mukherjee, Program Director, Directorate for Engineering, Division of Engineering Education & Centers, 585 N, telephone: (703) 292-8381, fax: (703) 292-9051, email: [tmukherj@nsf.gov](mailto:tmukherj@nsf.gov)
- Joanne D. Culbertson, Staff Associate for Planning and Evaluation, Directorate for Engineering, 505 N, telephone: (703) 292-4602, fax: (703) 292-9013, email: [jculbert@nsf.gov](mailto:jculbert@nsf.gov)
- Priscilla P. Nelson, Senior Advisor, Directorate for Engineering, 505 N, telephone: (703) 292-7018, fax: (703) 292-9013, email: [pnelson@nsf.gov](mailto:pnelson@nsf.gov)

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

- 47.041 --- Engineering

#### Eligibility Information

---

- **Organization Limit:** U.S. Academic Institutions
- **PI Eligibility Limit:** None Specified.
- **Limit on Number of Proposals:** None Specified.

#### Award Information

---

- **Anticipated Type of Award:** Standard Grant
- **Estimated Number of Awards:** 10 - Planning Grants of up to a total of \$100,000 each for a duration of up to one or two years
- **Anticipated Funding Amount:** \$1,000,000

#### 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:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

#### C. Due Dates

- **Full Proposal Deadline Date(s)** (due by 5 p.m. proposer's local time):  
January 07, 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.

#### TABLE OF CONTENTS

---

### Summary of Program Requirements

- I. **Introduction**
- II. **Program Description**
- III. **Eligibility Information**
- IV. **Award Information**
- V. **Proposal Preparation and Submission Instructions**
  - A. Proposal Preparation Instructions
  - B. Budgetary Information
  - C. Due Dates
  - D. FastLane Requirements
- VI. **Proposal Review Information**
  - A. NSF Proposal Review Process
  - B. Review Protocol and Associated Customer Service Standard
- VII. **Award Administration Information**
  - A. Notification of the Award
  - B. Award Conditions
  - C. Reporting Requirements
- VIII. **Contacts for Additional Information**
- IX. **Other Programs of Interest**

## I. INTRODUCTION

---

**CLEANER** (Collaborative Large-scale Engineering Analysis Network for Environmental Research) will be an integrated network to support fundamental engineering research and education on large-scale, environmental problems. It will provide researchers across the nation with access to leading-edge linked sensing networks, data repositories, characterization and computational tools for integrated assessment modeling, connected through high performance computing and telecommunications networks. Modeling would be the central component for analysis, knowledge synthesis, and design of further experimentation, including hydrodynamics, episodic sediment transport, flow diversion, population impacts, and biological pathways, among others. Modeling for adaptive management would also include systems analysis and life cycle assessment (LCA) models that incorporate consideration of economics, uncertainty and risk, and decision-making on how to use sensor networks effectively. Specifically, the integrated assessment models will allow both disciplinary and multidisciplinary researchers to synthesize knowledge about diverse environmental settings, and based on the identification of knowledge gaps, the need for new or expanded sensing capabilities. Such interactions will facilitate cross-disciplinary discussion, which can lead to improved theory.

**CLEANER** will enable a new mode of research for the engineering community and will be instrumental in developing a workforce skilled in multidisciplinary research and education. Through a focus on multidisciplinary approaches to understanding large-scale environmental problems and developing tools and protocols to integrate data from different disciplines, the development of new collaborative tools will be facilitated. Because such collaborations will entail numerous time scales, real-time dynamic data acquisition, navigating various databases, and unifying tools and methodologies, the development of cyberinfrastructure is integral to the success of **CLEANER**. **CLEANER** will be a real-world test bed for cyberinfrastructure development in the Engineering Directorate.

Since **CLEANER** will be a networked facility to promote multidisciplinary research on adaptive environmental management and a test bed for engineering cyberinfrastructure investments, it will provide a focus for developing and/or defining:

- user needs and system architecture, software, hardware, technical support, and outreach and training for effectively addressing these user needs;
- innovative high performance sensors;
- configuring, siting, and operating integrated sensor networks;
- advanced modeling capabilities;
- LCA models and tools supporting complex analysis of tradeoffs between data quality and quantity, and data integration across different spatial and temporal scales;
- collaborative tools;
- characterization tools that identify distribution gradients and sources of unanticipated stressors;
- new tools and strategies for storing, accessing, manipulating, analyzing, integrating and visualizing diverse data sets;
- common data handling protocols and standards; and
- integration of experimentation and simulation.

Among the many challenges facing environmental quality management, the success of **CLEANER** to provide engineering options for adaptive management hinges on creating sensing systems and networks, including identifying what new sensors are needed and facilitating their development. The networked sensing systems encompass data management systems, and the integration of experimentation and simulation to achieve the goal of sustainable environmental management. To enable this success, there will be close collaboration with the IT community, including any of the generalized information or systems technologies important to cyberinfrastructure, ranging from network technology, to adaptive systems, to sensor fusion, and to signal processing, among others. Consequently, proposers are required to team with IT researchers.

Additionally, a global perspective and collaboration to achieve overall balance and mutual benefit with research partners may be appropriate, e.g., specific international networks for research and education. Investigators considering an international component in their proposal are strongly encouraged to contact a cognizant program director early in the proposal planning process.

## II. PROGRAM DESCRIPTION

---

The goal of **CLEANER** is to enable a community framework for model forecasting that will promote more effective adaptive management approaches for anthropogenically stressed environmental systems. Through integrated assessment modeling, **CLEANER** would utilize modeling as the central component for analysis, knowledge synthesis and design of further experimentation, when appropriate. The possibilities for such analysis and synthesis are further enhanced by new detection and communication modes made possible through emerging and revolutionary cyberinfrastructure. Because **CLEANER** will be a networked facility, it will provide a focus for developing and/or defining user needs, system architecture, high performance sensors, the operation of integrated sensor networks, and data handling protocols and standards. The coupling of these capabilities with advanced modeling will lead to the integration of experimentation and simulation.

**CLEANER** would accomplish this goal by providing researchers and educators across the Nation access to leading-edge linked sensing networks, data repositories, and characterization and computational tools for integrated assessment modeling. Through development of an **Engineering Analysis Network** linked by cyberinfrastructure, a collaborative research atmosphere will be facilitated. ENG considers Information Technology to be integral to the success of **CLEANER** and requires proposers to team with an IT researcher.

To assist in the further development of the **CLEANER** concept, we seek planning grant proposals, the purpose of which is to define key characteristics of:

- a. the role of the network as a whole, including how to partner/collaborate with current activities, and how it complements existing small- and large-scale facilities, therewith clearly defining **CLEANER**'s value adding to existing infrastructure/research activities, both at NSF and other agencies;
- b. different scale and location strategies for defining/selecting field facilities to form an integrated network, esp., comparing benefits of a network based on a large-scale focus on *cross-cutting key issues* (e. g., nitrogen impacts on aquatic systems) vs. *regional environmental systems*;
- c. identifying fundamental knowledge gaps in adaptive management that can be addressed by **CLEANER**, including an assessment of the existing information infrastructure and how information is used in decision making;
- d. a potential portfolio of tools for the integrated network, especially what kinds of capabilities the network should provide and what kinds of tools would be essential to identify and address essential research issues, including design and implementation of sensor networks and how they would advance fundamental multidisciplinary research, and how the tools at potential sites might complement and support those of other sites;
- e. the development and management of intellectual collaborative and synthesis tools and activities, including key issues that would have to be addressed in terms of data standards, quality and access, as well as, the tools and standards for effective knowledge synthesis and integration of models, and the training and technical support that would be provided to assist in organizing the user community;

- f. an effective management structure to define research and education priorities for the network and to ensure close linkage and cooperation among the individual facilities such that they operate as a cohesive national network; and
  
- g. a focus on integrated assessment modeling yielding effective adaptive environmental management options through a cybernetworked infrastructure of linked facilities that would build upon existing modeling efforts and enable a community framework for predictive modeling.

These planning grant proposals, if awarded, would represent an initial effort to develop a research plan that the Engineering research and education community and practitioners will continue to develop through additional planning activities.

ENG has funded three workshops for early development of the **CLEANER** concept. **CLEANER** Workshop 1 was held at Stanford University on December 4-5, 2001. **CLEANER** Workshop 2 was hosted by the University of Minnesota-Minneapolis on October 20-22, 2002. **CLEANER** Workshop 3 was hosted by Duke University on February 2-4, 2003. Workshop reports are posted on the web at <http://cleaner.ce.berkeley.edu>, and should be consulted for additional information on **CLEANER**.

Overall, these planning grants, and other continuing efforts should provide ENG with direction in the development of the **CLEANER** concept. A Grantee's Workshop will be held in the Fall of 2004 to assist NSF in the ongoing concept development for **CLEANER** and how it can be a cyberinfrastructure test bed. Grantees must set aside funds to attend this required workshop, which will be held at NSF in Arlington, VA.

A primary challenge for science and engineering is to probe and elucidate the environmental needs of our time and the ways in which they can be effectively met. At the core of this challenge is the requirement for fundamental understanding of the interactions of the atmosphere, geosphere, biosphere and human interventions in environmental systems, across spatial and time scales. The role of engineering in the development of appropriate technologies, and their fundamental underpinnings, must work in consonance with this understanding in maintaining sustainable resources, through adaptive environmental management. This suggests an iterative process of analysis, identification and discovery of new knowledge, and feedback to promote new technologies, leading to redefining the next point of departure, *i.e.*, from basic to applied research focusing on science, technology, and education. Thus, the development of cyberinfrastructure is integral to the success of **CLEANER**.

### III. ELIGIBILITY INFORMATION

---

U. S. Academic Institutions are eligible to submit proposals under this program announcement. Proposers are required to team with an IT researcher.

### IV. AWARD INFORMATION

---

10 Standard Planning Grants of up to a total of \$100,000 each for a duration of up to one or two years.

### 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](mailto:pubs@nsf.gov).

Proposers are reminded to identify the program announcement/solicitation number (03-607) 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.

### Other Budgetary Limitations:

Budget may not exceed \$100,000 and should include funds for a Grantees' workshop in the Fall of 2004.

## 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):

January 07, 2004

## D. FastLane Requirements

---

Proposers are required to prepare and submit all proposals for this announcement/solicitation through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <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](mailto: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](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](mailto: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:

- Nicholas L. Clesceri, Program Director, Directorate for Engineering, Division of Bioengineering & Environmental Systems, 565 S, telephone: (703) 292-7940, fax: (703) 292-9098, email: [nclescer@nsf.gov](mailto:nclescer@nsf.gov)
- Richard J. Fragaszy, Program Director, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-8360, email: [rfragasz@nsf.gov](mailto:rfragasz@nsf.gov)
- Thomas W. Chapman, Program Director, Directorate for Engineering, Division of Chemical & Transport Systems, 525 N, telephone: (703) 292-8370, fax: (703) 292-9054, email: [tchapman@nsf.gov](mailto:tchapman@nsf.gov)

- Delcie R. Durham, Program Director, Directorate for Engineering, Division of Design, Manufacture, & Industrial Innovation, 550 S, telephone: (703) 292-7060, fax: (703) 292-9056, email: [ddurham@nsf.gov](mailto:ddurham@nsf.gov)
- Paul J. Werbos, Program Director, Directorate for Engineering, Division of Electrical & Communications Systems, 675 S, telephone: (703) 292-8339, fax: (703) 292-9147, email: [pwerbos@nsf.gov](mailto:pwerbos@nsf.gov)
- Tapan K. Mukherjee, Program Director, Directorate for Engineering, Division of Engineering Education & Centers, 585 N, telephone: (703) 292-8381, fax: (703) 292-9051, email: [tmukherj@nsf.gov](mailto:tmukherj@nsf.gov)
- Joanne D. Culbertson, Staff Associate for Planning and Evaluation, Directorate for Engineering, 505 N, telephone: (703) 292-4602, fax: (703) 292-9013, email: [jculbert@nsf.gov](mailto:jculbert@nsf.gov)
- Priscilla P. Nelson, Senior Advisor, Directorate for Engineering, 505 N, telephone: (703) 292-7018, fax: (703) 292-9013, email: [pnelson@nsf.gov](mailto:pnelson@nsf.gov)

For questions related to the use of FastLane, contact:

- Marcia Rawlings, Computer Specialist, Directorate for Engineering, Division of Bioengineering & Environmental Systems, 565 S, telephone: (703) 292-7956, fax: (703) 292-9098, email: [mrawling@nsf.gov](mailto:mrawling@nsf.gov)
- FastLane Help Desk telephone: 1-800-673-6188, email: [fastlane@nsf.gov](mailto:fastlane@nsf.gov)

## IX. OTHER PROGRAMS OF INTEREST

---

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

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

## ABOUT THE NATIONAL SCIENCE FOUNDATION

---

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

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities and persons with disabilities to compete fully in its programs. In accordance with Federal statutes, regulations and NSF policies, no person on grounds of race, color, age, sex, national origin or disability shall be excluded

from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF, although some programs may have special requirements that limit eligibility.

*Facilitation Awards for Scientists and Engineers with Disabilities (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 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](mailto: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.

[nsf.gov](http://nsf.gov)

[| About NSF](#) | [Funding](#) | [Publications](#) | [News & Media](#) | [Search](#) | [Site Map](#) | [Help](#)

---



**The National Science Foundation**  
4201 Wilson Boulevard, Arlington, Virginia 22230, USA  
Tel: 703-292-5111, FIRS: 800-877-8339 | TDD: 703-292-5090 or (800) 281-8749

[Policies](#)  
[Contact NSF](#)  
[Customize](#)