George E. Brown, Jr. Network for Earthquake Engineering Simulation Research (NEESR)

Program Solicitation
NSF 05-527
***Replaces Document* NSF 03-589**

National Science Foundation
Directorate for Engineering
Division of Civil and Mechanical Systems

Letter of Intent Due Date(s) *(optional):*

February 01, 2005

(Optional)

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

March 11, 2005

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

George E. Brown, Jr. Network for Earthquake Engineering Simulation Research (NEESR)

Synopsis of Program:

The Division of Civil and Mechanical Systems in the Directorate for Engineering of the National Science Foundation invites proposals for research that utilizes the George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES). NEES is a national, shared use experimental resource for advancing knowledge and technology to improve the design and performance of the Nation's civil and mechanical infrastructure when subjected to earthquake excitation and tsunamis. NEES became operational for research and education activities on October 1, 2004, and will be operational through September 30, 2014. NEES comprises a network of 15 earthquake engineering experimental equipment sites, available for experimentation on-site or in the field and through telepresence. NEES equipment sites include shake tables, geotechnical centrifuges, a tsunami wave basin, unique large-scale testing laboratory facilities, and mobile and permanently installed field equipment. The NEES networking cyberinfrastructure, known as NEESgrid, connects, via Internet2, the equipment sites as well as provides telepresence, a curated national data repository, simulation tools, and collaborative tools for facilitating on-line planning, execution, and post-processing of experiments. Through NSF funding, NEES Consortium, Inc., operates the NEES infrastructure (equipment sites and NEESgrid); coordinates education, outreach and training activities for NEES; develops partnerships nationally and internationally to enhance the capabilities of and participation in NEES; and establishes community-based policies for facilities sharing and data archiving and sharing.

Projects proposed and funded under this solicitation must utilize one or more of the NEES equipment sites and the NEESgrid cyberinfrastructure operated by NEESinc. Proposals may be submitted in three categories: Grand Challenge, Small Group, and Individual Investigator. Optional "payload" and "cyberinfrastructure tool" project components may be submitted as part of the proposal.

Cognizant Program Officer(s):

- Joy M. Pauschke, Program Director, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-7024, fax: (703) 292-9053, email: jpauschk@nsf.gov

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

- 47.041 --- Engineering

Eligibility Information

- **Organization Limit:**

  U.S. universities and colleges may submit proposals as the lead organization. Proposals involving integrated partnerships (e.g., multi-organizational arrangements including other universities and colleges, minority-serving institutions, women's colleges, predominantly undergraduate institutions, national laboratories, nonprofit organizations, private sector organizations, government agencies, and international collaborators) are encouraged. Note that the number of participating organizations and project participants is not necessarily a measure of quality. Proposals must justify that all participating organizations and project participants are integral to achieving the goals and functions of the project.

  Proposals involving more than one organization must be submitted as a single administrative package from the lead organization; collaborative proposals with multiple administrative packages will not be accepted.

- **PI Eligibility Limit:** None Specified.
- **Limit on Number of Proposals:** A Principal Investigator may submit only one proposal. However, a Principal Investigator for one proposal may be a co-Principal Investigator or project participant on other proposals submitted to this program solicitation.

Award Information

- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 8 to 12 - which includes a combination of Grand Challenge, Small Group, and Individual Investigator awards.
- **Anticipated Funding Amount:** $9,000,000 expected in 2005, pending availability of funds and quality of proposals.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is optional. Please see the full text of this solicitation for further information.
- **Full Proposal Preparation Instructions:** This solicitation contains information that deviates from the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full text of this solicitation for further information.

B. Budgetary Information

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

C. Due Dates

- **Letters of Intent *(optional)*:**
  February 01, 2005
  (Optional)
- **Full Proposal Deadline Date(s)** (due by 5 p.m. proposer's local time):
  March 11, 2005

Proposal Review Information

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

Award Administration Information

- **Award Conditions:** Additional award conditions apply. Please see the full text of this solicitation for further information.
- **Reporting Requirements:** Standard NSF reporting requirements apply.

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IX. **Other Programs of Interest**

I. INTRODUCTION

The Division of Civil and Mechanical Systems (CMS) in the Directorate for Engineering of the National Science Foundation (NSF) invites proposals for research that utilizes the George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES). NEES is a national, shared use experimental resource for advancing knowledge and technology to improve the design and performance of the Nation's civil and mechanical infrastructure when subjected to earthquake excitation and tsunamis. NEES became operational for research and education activities on October 1, 2004, and will be operational through September 30, 2014. NEES comprises a network of 15 earthquake engineering experimental equipment sites, available for experimentation on-site or in the field and through telepresence. NEES equipment sites include shake tables, geotechnical centrifuges, a tsunami wave basin, unique large-scale testing laboratory facilities, and mobile and permanently installed field equipment. The NEES networking cyberinfrastructure, known as NEESgrid, connects, via Internet2, the equipment sites as well as provides telepresence, a curated national data repository, simulation tools, and collaborative tools for facilitating on-line planning, execution, and post-processing of experiments. Through NSF funding, NEES Consortium, Inc. (NEESinc), operates the NEES infrastructure (equipment sites and NEESgrid); coordinates education, outreach and training activities for NEES; develops partnerships nationally and internationally to enhance the capabilities of and participation in NEES; and establishes community-based policies on facilities shared use and data archiving and sharing.

Projects proposed and funded under this solicitation must utilize one or more of the NEES equipment sites and the NEESgrid cyberinfrastructure operated by NEESinc. Information about NEES, NEESinc, the 15 NEES experimental equipment sites (including detailed specifications about each site's equipment and capabilities as well as contact information), and NEESgrid resources is available at the NEESinc web site (http://www.nees.org).

NEES provides the opportunity for researchers to participate in cutting edge research to extend theory; model-based simulation; computational and visualization tools; design practice and codes in earthquake engineering; advanced technologies for design, retrofit and remediation; experimental techniques; and sensor technology. As an integrated network, NEES offers opportunities for earthquake engineering research to enable or enhance the investigation of problems at the systems level, in a more systematic way than previously possible through use of multiple, independent equipment sites. In addition, optional "payload" and "cyberinfrastructure tool" project components may be submitted as part of the research, as described later in this solicitation. Proposers may wish to review the following resources for potential research topics. This is not meant to be an exhaustive list but rather to point proposers to some recent reports and information that may be helpful during proposal development.

- *Preventing Earthquake Disasters: The Grand Challenge in Earthquake Engineering. A Research Agenda for the Network for Earthquake Engineering Simulation (NEES)* (available at http://www.nationalacademies.org/publications/), a report from a panel organized by the National Research Council of the National Academies to develop a long-term agenda for earthquake engineering research needs that is well suited to investigative techniques involving use of the NEES experimental resources.
- *Securing Society Against Catastrophic Earthquake Losses: A Research and Outreach Plan in Earthquake Engineering (*available at http://www.eeri.org/cds_publications/securing_society.pdf), a long term research and outreach agenda for the earthquake engineering field prepared by the Earthquake Engineering Research Institute.
- *Research Needs Report (*available at http://www.bssconline.org). The *National Earthquake Hazards Reduction Program (NEHRP) Recommended Provisions for Seismic Regulations for New Buildings and Other Structures* provide the minimum level design requirements for the protection of life safety in buildings subject to earthquakes in the United States. At the end of each of its triennial updates of this document, the Building Seismic Safety Council (BSSC) prepares a *Research Needs Report,* which provides a list of issues that each of the thirteen technical subcommittees examined but could not resolve during the Provisions update process, due to a lack of available data or information. This report identifies issues that run the entire spectrum of seismic design and construction and generally represent the cutting edge of seismic building science, and are areas where the subcommittees believe future research emphasis is needed that could then be utilized during future updates of the Provisions. Development of the NEHRP Provisions is coordinated by the Federal Emergency Management Agency.
- The 3-D Full-Scale Earthquake Testing Shake Table Facility, known as E-Defense, (http://www.bosai.go.jp/sougou/sanjigen/3De/index.htm), being built by the Japanese National Research Institute for Earth Science and Disaster

Prevention (NIED), is scheduled to open for research in 2005. The NEES equipment sites and E-Defense facility offer complementary earthquake engineering experimental facilities for large/full scale testing. Preliminary meetings have been held in 2004 between researchers in the United States and Japan to develop collaborative research strategies for investigation of the seismic performance of steel structures and bridges that require coordinated use of the NEES and E-Defense facilities. Summaries of these meetings are available at the NEESinc web site (http://www.nees.org).

- The NSF Middleware Initiative web site (http://www.nsf-middleware.org) contains information on the latest middleware software packages and cyberinfrastructure tools for science and engineering research and education.

The NEES infrastructure also provides national resources for developing, coordinating, and sharing new educational programs and materials to train the next generation engineering workforce. NEESinc has developed, through community input, an *Education, Outreach, and Training (EOT) Strategic Plan for NEES* (available at http://www.nees.org) that outlines a strategy for the use of NEES resources for EOT to best serve the needs of the earthquake engineering community. To maximize broader impacts, proposers are required to align their project's education and outreach component with this plan and coordinate activities with NEESinc.

For projects funded under this program solicitation, NEESinc will coordinate access to, scheduling, and announcement of experiments and educational projects at the NEES equipment sites. Projects awarded under this solicitation must conform to the *NEES Facilities Users' Guide* and the NEESinc *Data Sharing and Archiving Policies and Guidelines* available on the NEESinc web site (http://www.nees.org). NSF expects awardees under this program solicitation to comply with these community-established policies for equipment site usage and documenting and sharing of data results.

NSF will hold an informational meeting after release of this program solicitation to inform research communities about this funding opportunity and answer questions about this solicitation. Proposers should check the NEESinc web site (http://www.nees.org) for information about the informational meeting.

II. PROGRAM DESCRIPTION

General Information Regarding NEES Research (NEESR)

NEES is a new era in NSF-funded earthquake engineering research to speed earthquake loss-reduction. NEES represents the culmination of over a decade of planning and construction by the earthquake engineering community to develop advanced earthquake engineering experimental research capabilities in the United States. NEES offers opportunities in earthquake engineering to enable or enhance the study of larger scope, requiring experimental resources, in a more systematic way than previously possible. As such, this solicitation is aimed at providing research funding to support innovative research into the performance of structural, nonstructural, geotechnical, hydraulic, and other civil and mechanical infrastructure systems during earthquake excitation or tsunamis. Projects funded under this solicitation are expected to be comprehensive in research scope and provide key research insights and results that will *rapidly* advance the state of the art. Projects that involve a cross-disciplinary team and active participation by practitioners, industry, and public policy makers to formulate the research problem and speed technology transfer are strongly encouraged.

Proposals submitted under this solicitation must utilize one or more of the NEES equipment sites operated by NEESinc. **Proposals that do not require the use of at least one NEES equipment site operated by NEESinc will be returned without review.** Investigators who wish to conduct earthquake engineering research that does not require use of at least one NEES equipment site operated by NEESinc should submit proposals to one of the existing programs within NSF/CMS (http://www.nsf.gov/eng).

NEESR Individual Investigator, Small Group, and Grand Challenge Proposals

NEESR projects will be supported in three categories, according to the research scope and project team composition: Individual Investigator (II), Small Group (SG), and Grand Challenge (GC). Each project category is described below. All proposed projects (II, SG, and GC) must include the following required **general key features**:

- Vision for research in earthquake engineering requiring use of at least one NEES equipment site operated by NEESinc;
- Research outcomes to advance the state of the art in earthquake engineering;
- Strategic research plan to realize the vision;
- Research program encompassing experimental and analytical investigations;
- Project implementation plan, including the following: project schedule; project management plan; organizational chart for all project phases; plan for experimental planning, testing and post-processing and analysis to use NEESgrid resources (e.g., collaborative tools, data repository, simulation tools, telepresence configured for both private and public clients); test set-ups to include both private and public clients; and plan for removal/disposal of experimental specimens;
- Education and outreach activities, with an interactive project web site, which are aligned with the community-developed *Education, Outreach, and Training (EOT) Strategic Plan for NEES* (available at http://www.nees.org) and coordinated with NEESinc;
- Risk mitigation plan; and
- Plan for dissemination and transfer of findings to the earthquake engineering community, including a Data Archiving and Sharing Plan using the NEES national data repository in accordance with the NEESinc *Data Sharing and Archiving Policies and Guidelines.*

NEESR Individual Investigator (NEESR II) Proposals

NEESR II proposals should focus on a specific problem in detail; thus, they are similar to traditional individual investigator research proposals. The research will be conducted by an individual investigator or small research team and may involve more than one organization, within the budget constraints of this type of award. II projects will be funded for up to three years and must include the required general key features described above.

NEESR Small Group (NEESR SG) Proposals

NEESR SG proposals should focus on a research problem requiring a cross-disciplinary collaborative team. As a result, the scope is larger than that of an individual investigator proposal. SG projects will be funded for up to four years. In addition to the required general key features listed above, SG projects must also include the following key features:

- Principal Investigator must devote at least two months of effort annually to the project;
- Cross-disciplinary and, if appropriate, a multi-organizational project team;
- Project team and leadership inclusive in gender, race, and ethnicity;
- Opportunities for payload projects to the extent practical; and
- Cyberinfrastructure tool component (optional).

NEESR Grand Challenge (NEESR GC) Proposals

NEESR GC proposals should focus on a compelling national research problem that can now be addressed through the use of NEES resources. GC projects must take a comprehensive systems approach that warrants an in-depth, cross-disciplinary, and multi-organizational investigation to achieve project goals, with a scope that includes research, education, and technology transfer activities. In particular, GC proposers may find it especially helpful during the proposal preparation stage to include input from practitioners, industry, and public policy makers to formulate the research and technology transfer strategy and who may also become part of the project team. Proposers of GC projects are encouraged to form a geographically distributed project team that also includes early career faculty as well as participants from minority-serving institutions, women's colleges, and predominantly undergraduate institutions. The project may benefit from a project manager, who may either be the Principal Investigator or a member of the project team. GC projects will be funded for up to five years. In addition to the required general key features listed above, SG projects must also include the following key features:

- Principal Investigator must devote at least two months of effort annually to the project;
- Systems-level approach to a research problem in earthquake hazard mitigation;
- Geographically distributed, cross-disciplinary, and multi-organizational project team;
- Project team and leadership inclusive in gender, race, and ethnicity;

- An External Advisory Board (members to be named after the NSF award is made);
- Opportunities for payload projects to the extent practical; and
- Cyberinfrastructure tool component (optional).

Payload Component (Optional)

NEESR GC and SG projects offer a unique opportunity for researchers outside the project team to utilize the project's test set-up to accommodate a considerably smaller experimental investigation of a "payload" component, referred to as a "payload project." This payload component is not necessarily part of the main structural, geotechnical, or infrastructure system, e.g., the payload may be a mechanical, control, sensing, or nonstructural component that may detect or support operation of the overall system, but is not part of the load carrying system. Payload projects also may concern the load carrying structural system or its components. The GC or SG project's test set-up would provide the vehicle for testing the payload component. GC and SG projects may identify and include potential payload projects as part of the proposal submission to this program solicitation, not to exceed the maximum award limitations in each project category. Alternatively, after a GC or SG award is made, NSF may fund payload projects separately, either to the project team or to researchers outside the project team, through the Small Grants for Exploratory Research (SGER) program.

Cyberinfrastructure Tool Component (Optional)

The NEESgrid cyberinfrastructure operated by NEESinc provides a cross-disciplinary laboratory to develop new cyberinfrastructure tools for NEES, based on evolving information technology capabilities and NEES community user requirements, that can stimulate new mechanisms for collaboration, experimentation, telepresence, data integration, computational simulation, and visualization. NEESR GC and SG project platforms offer a unique opportunity for earthquake engineering and computer and information science and engineering researchers to partner to develop and deploy new cyberinfrastructure tools for the NEESgrid cyberinfrastructure that are beyond the scope of maintenance and operations of NEESgrid by NEESinc. This may include: (a) development of a new cyberinfrastructure tool and capability, (b) a significant enhancement of existing NEESgrid services and capabilities through major modification, or (c) porting an existing cyberinfrastructure tool to fit into NEESgrid. If tools are already pre-existing in the area proposed, the proposers should describe the distinction and advantages in their approach, or new tool, over available alternatives. Through this solicitation, CMS, in partnership with the Directorate for Computer and Information Science and Engineering (CISE), Division of Shared Cyberinfrastructure (SCI), will co-fund development and deployment of new cyberinfrastructure tools for NEES (that may also be useful to other engineering and scientific communities) that are driven by the user requirements of the NEES community and the proposed research project and will be deployed within the framework of the NEESgrid cyberinfrastructure. The proposal should demonstrate awareness of and agree to conform to all NEESinc software, quality assurance, testing, documentation, and open source requirements. Proposers must coordinate all phases of the cyberinfrastructure tool project with NEESinc staff, and the deployment should result in the tool incorporated into a NEESinc-scheduled NEESgrid software release. More information about NEESgrid is available at the NEESinc web site (http://www.nees.org). Proposers are also strongly encouraged to review information on middleware releases and directions through the NSF Middleware Initiative web site (http://www.nsf-middleware.org).

Proposers interested in including a cyberinfrastructure tool component should discuss their plans with NEESinc during the proposal preparation process. Proposals with a cyberinfrastructure tool component:

- Must include a supporting letter from NEESinc in the supplementary documents section of the proposal;
- May include up to additional five pages in the project description outlining the tool development, prototype, and deployment process, including the interactions with NEESinc;
- Must include in the project schedule a timeline showing the stages of developing, prototyping, and deploying the tool, including the interactions with NEESinc; and
- May budget up to an additional $200,000 annually, for up to three years, for the development, prototype, and deployment of the tool.

Earth Science (EarthScope)/Earthquake Engineering (NEES) Research Opportunities

EarthScope is an Earth science program to explore the 4-dimensional structure of the North American continent. The EarthScope Program provides a framework for broad, integrated studies across the Earth sciences, including research on fault properties and the earthquake process, strain transfer, magmatic and hydrous fluids in the crust and mantle, plate

boundary processes, large-scale continental deformation, continental structure and evolution, and composition and structure of the deep-Earth. In addition, EarthScope offers a centralized forum for Earth science education at all levels and an excellent opportunity to develop cyberinfrastructure to integrate, distribute, and analyze diverse data sets. The nucleus of the program is the EarthScope Facility, consisting of the Plate Boundary Observatory, the San Andreas Fault Observatory at Depth, and the USArray. The EarthScope Facility is a multi-purpose array of instruments and observatories that will greatly expand the observational capabilities of the Earth Sciences and permit us to advance our understanding of the structure, evolution and dynamics of the North American continent. The Facility is designed to continually incorporate technological advances in geophysics, seismology, geodesy, information technology, drilling technology, and downhole instrumentation. For further information, visit the EarthScope web site (http://www.earthscope.org). The NEES and EarthScope facilities provide complementary capabilities to extend the continuum and interface of knowledge and technology in earth sciences and earthquake engineering. Co-funding opportunities will be considered between CMS, through this solicitation, and by the Directorate for Geosciences (GEO), Division of Earth Sciences (EAR), for projects that propose research requiring coordinated use of both NEES and EarthScope facilities. Proposals should address both the requirements of this solicitation and program solicitation NSF 04-589, *EarthScope: Science, Education, and Related Activities*. Proposals will be co-reviewed by ad hoc mail reviews and/or panels formed to review proposals under this solicitation and under program solicitation NSF 04-589.

International Collaboration Opportunities

General Information: NSF encourages collaboration with international researchers. Proposals including international collaboration should address their collaboration in the management plan and identify the names and organizations of the international collaborators, the nature and goals of collaboration activities, and the international synergies and benefits to be gained from the collaboration. NSF polices and procedures regarding participation of international researchers in NSF awards can be obtained from the NSF Office of International Science and Engineering (http://www.nsf.gov/home/int/).

NEES/E-Defense Earthquake Engineering Research Collaboration: The NEES equipment sites operated by NEESinc and the new Japanese E-Defense shake table operated by NIED offer complementary earthquake engineering experimental facilities for large/full scale testing. Preliminary meetings have been held in 2004 between researchers in the United States and Japan to identify research strategies for investigations of the seismic performance of steel structures and bridges that require coordinated use of the NEES and E-Defense facilities. Summaries of these meetings are available at the NEESinc web site (http://www.nees.org). Up to $3,000,000 of the total funding available under this solicitation may be awarded for collaborative research on steel structures and bridges between U.S. and Japanese researchers utilizing the NEES equipment sites and E-Defense shake table facility, pending availability of funds and quality of proposals. This funding may be used to support NEESR awards made under this solicitation as standard or continuing grants. NSF strongly encourages proposals to be submitted for these topics that coordinate such research for the United States at the national level, rather than through uncoordinated, individual projects; proposals most likely will be best suited under the Grand Challenge or Small Group project categories. Proposals for NEES/E-Defense research collaboration must include the following: (1) in the project participant list, the names, affiliations, and roles of the proposed Japanese, as well as U.S., researchers, and (2) in the supplementary documents section, one letter of support must be provided from the counterpart lead Japanese researcher responsible for coordinating with the Principal Investigator verifying the interest in collaboration; the availability of funds, if any, for Japanese researcher support; and the availability of the E-Defense facility for coordinated research. In accordance with NSF policy, international collaborators cannot be funded under this solicitation and must provide their own support.

NEESR Requirements Regarding Telepresence and Data

NEES experimental, telepresence, data archival, simulation, and collaborative capabilities have been designed to provide an infrastructure for earthquake engineering research and education partnerships, and to encourage broad participation from different segments of the earthquake engineering community (e.g., researchers, educators, students, practitioners, consultants, government agencies, national laboratories, international collaborators, etc.).

NEES enables broad teleparticipation in experimentation at each NEES equipment site, for both private clients (e.g., remote collaborators involved on the project research team) and public clients (e.g., remote viewers such as K-12 faculty and students, an engineering class, and practicing engineers). The planned test dates of all experiments conducted by awards made under this solicitation must coordinated with NEESinc and be announced on the NEESinc web site (http://www.nees.org). The experimental set-up must be configured to enable viewing by both private and public clients to the maximum extent practical. Viewing in this context means the ability to observe not only static web pages, but also includes a range of streaming images, subsets of non-mission critical sensor data, results, and background documentation. All of this should be

in a format that is appropriate to the intended educational outreach (public) clients/audience.

At all times, even when a specific test is not being conducted, a public telepresence website will be kept operational at each NEES equipment site allowing the general public to observe the real time events occurring in the laboratory facility (e.g., construction, experimentation, disassembly). In addition, NEES equipment sites must provide the ability to browse non-mission critical documentation, representative data, and, if practical, video replays of past experiments. The intent is to expand the community's awareness and understanding of the scientific process by allowing them into the laboratory in a safe manner, yet leaving them the opportunity to explore in a structured environment.

NEES has been designed to share both experimental facilities and the data generated from research that uses these facilities (experimental and analytical data). NSF advocates and encourages open scientific communication. NSF expects significant findings from supported research and educational activities to be *promptly* submitted for publication with authorship that accurately reflects the contributions of those involved. NSF expects awardees to share with other researchers, at no more than incremental cost and within a reasonable time, the data, samples, physical collections and other supporting materials created or gathered in the course of the work. NSF also encourages grantees to share software and inventions, once appropriate protection for them has been secured, and otherwise act to make the innovations they embody widely useful and usable.

All experimental data generated must be submitted electronically to the NEES national data repository maintained by NEESinc. Data in this context refers to all measurements, calibrations, observations, analyses, images, commentary, reports, logs, notes and/or electronic notebook entries which relate directly to the proposed experiments. Any data (as described above), which is recorded in hardcopy of any form, must be transcribed/converted, without loss of information, into an appropriate searchable format on to electronic media. In addition, this information must be properly characterized with appropriate metadata descriptors and then subsequently stored into one of the NEES accepted digital formats to facilitate archiving in accordance with the NEESinc *Data Sharing and Archiving Policies and Guidelines.*

NEESinc Equipment Site Policies Compliance Check (ESPCC)

Upon completion of the NSF peer review process and prior to the NSF award being made, proposals recommended for funding will undergo a supplementary review that will be coordinated by NEESinc with each equipment site at which experimental work is proposed. This *Equipment Site Policies Compliance Check (ESPCC)* provides NEESinc and the equipment sites an opportunity to assure policy compliance with respect to the *NEES Facilities Users' Guide*, experimental feasibility, safety, budget, schedule, and available data services. A copy of the ESPCC form is available at the NEESinc web site (http://www.nees.org). After NSF notification that the proposal is being recommended for an award, the prospective awardee must submit to NEESinc those sections of the proposal required by NEESinc and the equipment sites to evaluate policy compliance. The required information will include experimental plans (e.g., proposed schedule, specimen preparation details, equipment loads and sequence, instrumentation and data acquisition needs) and experimental portion of the budget. The information provided will be shared with NEESinc and equipment site staff. NEESinc will provide the prospective awardee with the outcome of the ESPCC, which the prospective awardee is to in turn share with NSF prior to award recommendation. Using the ESPCC outcomes, NSF will work with the prospective awardee to determine an effective start date for the award that may be later than the start date originally proposed and may require revised budgets. NSF expects NEESinc and the equipment sites to maintain confidentiality of the proposals during the ESPCC process.

III. ELIGIBILITY INFORMATION

U.S. universities and colleges may submit proposals as the lead organization. Proposals involving integrated partnerships (e.g., multi-organizational arrangements including other universities and colleges, minority-serving institutions, women's colleges, predominantly undergraduate institutions, national laboratories, nonprofit organizations, private sector organizations, government agencies, and international collaborators) are encouraged. Note that the number of participating organizations and project participants is not necessarily a measure of quality. Proposals must justify that all participating organizations and project participants are integral to achieving the goals and functions of the project.

Proposals involving more than one organization must be submitted as a single administrative package from the lead organization; collaborative proposals with multiple administrative packages will not be accepted.

IV. AWARD INFORMATION

All awards are subject to the quality of proposals received and availability of funding.

- Individual Investigator Awards
    - Up to six.
    - Funding up to $125,000 per year per award, for up to three years total.
- Small Group Awards
    - Up to six.
    - Funding up to $400,000 per year per award, for up to four years total.
    - Up to an additional $200,000 per year, for up to three years during the award, for an optional cyberinfrastructure tool component as part of the overall project.
- Grand Challenge Awards
    - Up to two.
    - Funding up to $500,000 for the first year, up to $500,000 for the last year, and up to $1,000,000 per year for the intermediate years, per award, for up to five years total.
    - Up to an additional $200,000 per year, for up to three years during the award, for an optional cyberinfrastructure tool component as part of the overall project.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent *(optional):*

A Letter of Intent is requested for each proposal that will be submitted to this solicitation. Letters of Intent should be submitted by lead Principal Investigators on FastLane by February 1, 2005 (optional). Letters of Intent from co-Principal Investigators, subawardees, or other participating organizations are not to be submitted. Using the FastLane module, proposers should include in the Letter of Intent the following project information:

- The project title. Indicate the project category (II, SG, or GC) in the title by starting the title with "NEESR-II," "NEESR-SG," or NEESR-GC" (up to 100 characters);
- The name, affiliation, contact information, and email address of the Principal Investigator;
- The names and affiliations of *all* co-Principal Investigators (up to four, entered in the "Other Senior Project Personnel Section" box);
- A list of all other project participants likely to be subawardees, consultants, international collaborators, etc., including names and affiliations (up to 50 maximum, entered in the "Other Comments" box, not to exceed 2,500 characters); and
- Synopsis of the proposed project (entered in the "Synopsis" box, up to 2,500 characters).

Letters of Intent are not mandatory but are strongly encouraged to enable NSF to begin organizing review panels before the proposal submission deadline. Letters of Intent are treated with the same confidentiality as NSF proposal submissions. For those Letters of Intent received at NSF by February 1, 2005, NSF will acknowledge receipt of the Letter of Intent via email to the Principal Investigator.

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.

Proposals submitted under this solicitation must utilize one or more of the NEES equipment sites operated by NEESinc. **Proposals that do not require the use of at least one NEES equipment site operated by NEESinc will be returned without review.**

Multi-organizational collaborative proposals may only be submitted if a single award is requested by the lead organization (with subawards administered by the lead organization). Collaborative proposals that are the simultaneous submission of proposals from different organizations, with each organization requesting a separate award, will be returned without review.

Proposal titles must begin with one of the following phrases: Individual Investigator proposal titles must begin with the phrase "**NEESR-II**;" Small Group proposal titles must begin with the phrase "**NEESR-SG**;" Grand Challenge proposal titles must begin with the phrase "**NEESR-GC**." Proposals with titles that do not begin with one of these three phrases will be returned without review.

Individual Investigator proposals are limited to the standard 15-page limit for the project description. Because of their larger scopes, Small Group and Grand Challenge proposals will be limited to 20 and 25 pages, respectively, for the project description. Small Group and Grand Challenge proposals containing a cyberinfrastructure tool component may include up to an additional five pages in the project description section. Proposals must have the entire project description submitted to FastLane in a single file upload. The project scope, budget, and schedule must incorporate all activities required to conduct the entire project. Proposers should consult the *NEES Facilities Users' Guide* (available at http://www.nees.org), as well as NEESinc and the NEES equipment site(s) intended to be used in the project, during proposal preparation for information on the shared use of NEES equipment sites, including protocols, scheduling, budget, and experimental planning information.

Proposals must include the following items in the project description, in addition to the other required items in the NSF Grant Proposal Guide:

- Page one of the project description: A table that lists each project team member's name, title, affiliation, expertise, role in the project, and annual time allotted for project activities. Note: Proposals must not include the names of External Advisory Board members. Proposals that contain the names of External Advisory Board members will be returned without review.
- Page two of the project description: A one-page summary of the resources at the NEES equipment site(s) and any other major experimental facilities to be utilized in the proposed project, including the planned schedule and duration of use of each equipment site/facility.
- Discussion of intellectual merit to include, but not limited to, the following:
    - Summary of discussions with NEESinc and equipment site(s) during the proposal preparation stage;
    - Literature review that justifies the "gap" in earthquake engineering knowledge that the project proposes to address;
    - How the proposal addresses each of the key features above for the project category (II, SG, or GC) submitted; and
    - Results of prior research, including submittal of experimental and analytical data to the NEES national data repository in accordance with NSF policy and the NEESinc *Data Sharing and Archiving Policies and Guidelines.*
- Discussion of broader impacts to include, but not limited to, the following:
    - How the education and outreach component contributes to the goals of the NEESinc *Education, Outreach,*

and Training (EOT) Plan for NEES, including broadening the participation of underrepresented groups, and how the project team will interact with NEESinc staff for this component;

- How the project team will interact through the use of the NEESgrid resources, and how the utilization of those resources will lead to broader impacts by the proposed research;
- Expected impact of project activities on the current and future earthquake engineering workforce; and
- Expected impact of the plan for dissemination of research findings and data.

Proposals must include a functional budget table with the requested budget itemized annually and cumulatively into the following categories:

- Research activities budget.
    - Experimental activities budget. Provide a separate breakdown for each NEES equipment site and any other facility used (e.g., Japanese E-Defense facility or other U.S. facility).
    - Non-experimental activities budget.
- Education and outreach activities budget.
- Management budget (only for GC projects that include a formal project manager).
- Data archiving and sharing budget.
- Payload project budget (if any).
- Cyberinfrastructure tool component budget (if any).

Allowable Supplementary Documents

The supplementary documents section may contain only the information requested below. No other documents are permitted to be included as a part of the proposal (e.g., letters of endorsement from professional organizations, consultants, practitioners, or other federal, state, and local government agencies, etc.). Proposals that contain documents other than those listed below will be returned without review:

- Project schedule for GC, SG, and II proposals.
- One letter of endorsement from NEESinc for the cyberinfrastructure tool component.
- For NEES/E-Defense collaborations: One letter of endorsement from the counterpart lead Japanese collaborator verifying interest in collaboration; proposed sources of Japanese research support, if any; and availability of the E-Defense facility for coordinated research.
- Formal vendor quote(s), if needed, for equipment or services beyond those available at the equipment sites.

Proposers are reminded to identify the program announcement/solicitation number (05-527) in the program announcement/ solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost Sharing:

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

C. Due Dates

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

Letters of Intent *(optional):*

February 01, 2005
(Optional)

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

March 11, 2005

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: https://www.fastlane.nsf.gov/a1/newstan.htm. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program announcement/solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this announcement/solicitation.

Submission of Electronically Signed Cover Sheets. The Authorized Organizational Representative (AOR) must electronically sign the proposal Cover Sheet to submit the required proposal certifications (see Chapter II, Section C of the Grant Proposal Guide for a listing of the certifications). The AOR must provide the required electronic certifications within five working days following the electronic submission of the proposal. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. Further instructions regarding this process are available on the FastLane Website at: http://www.fastlane.nsf.gov

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest, at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority-serving institutions, or adjacent disciplines to that principally addressed in the proposal.

The National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 (NSB 97-72). All NSF proposals are evaluated through use of the two merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

On July 8, 2002, the NSF Director issued Important Notice 127, Implementation of new Grant Proposal Guide Requirements Related to the Broader Impacts Criterion. This Important Notice reinforces the importance of addressing both criteria in the preparation and review of all proposals submitted to NSF. NSF continues to strengthen its internal processes to ensure that both of the merit review criteria are addressed when making funding decisions.

In an effort to increase compliance with these requirements, the January 2002 issuance of the GPG incorporated revised proposal preparation guidelines relating to the development of the Project Summary and Project Description. Chapter II of the GPG specifies that Principal Investigators (PIs) must address both merit review criteria in separate statements within the one-

page Project Summary. This chapter also reiterates that broader impacts resulting from the proposed project must be addressed in the Project Description and described as an integral part of the narrative.

Effective October 1, 2002, NSF will return without review proposals that do not separately address both merit review criteria within the Project Summary. It is believed that these changes to NSF proposal preparation and processing guidelines will more clearly articulate the importance of broader impacts to NSF-funded projects.

The two National Science Board approved merit review criteria are listed below (see the Grant Proposal Guide Chapter III.A for further information). The criteria include considerations that help define them. These considerations are suggestions and not all will apply to any given proposal. While proposers must address both merit review criteria, reviewers will be asked to address only those considerations that are relevant to the proposal being considered and for which he/she is qualified to make judgments.

What is the intellectual merit of the proposed activity?
How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?
How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

NSF staff will give careful consideration to the following in making funding decisions:

Integration of Research and Education
One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities
Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

Additional Review Criteria:

Additional NSF Review Process for Proposals Containing a Cyberinfrastructure Tool Component

Proposals containing a cyberinfrastructure tool component will be co-reviewed by panels formed to review proposals under this solicitation and by panels and/or ad hoc mail reviews formed by CISE/SCI.

Additional NSF Review Process for Earth Science (EarthScope)/Earthquake Engineering (NEES) Research Proposals

Proposals focusing on Earth Science (EarthScope)/Earthquake Engineering (NEES) research will be co-reviewed by panels formed to review proposals under this solicitation and by panels and/or ad hoc mail reviews formed by GEO/

EAR.

Additional NSF Review Process for Grand Challenge Proposals

Grand Challenge (GC) proposals will first undergo a panel merit review, with ad hoc mail reviews as needed. The panel review will make recommendations for GC proposals to be considered for a second merit reverse site visit review. NSF/CMS staff will review these recommendations and select a shortlist of GC proposals to be invited by NSF for merit review (reverse site visit) by a Grand Challenge Research Panel. Principal Investigators that make the shortlist will be required for the reverse site visit to brief the Grand Challenge Research Panel in person at NSF headquarters in Arlington, VA. Each invited Principal Investigator may bring up to two additional project team members as briefing participants. NSF will notify the Principal Investigators of all submitted GC proposals of the planned review dates within one month after the proposal deadline. GC proposers should plan their schedules to be available for this second and final step of the merit review process in case they are selected. Briefing dates will not be rescheduled. Travel and other costs will be the responsibility of proposers. Proposers will be asked to submit, one week prior to the briefing, a ten-page maximum proposal addendum to address reviewer comments; this addendum will be included as part of the Grand Challenge Research Panel review.

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 proposers whether their proposals have been declined or recommended for funding within six months. The time interval begins on the closing date of an announcement/solicitation, or the date of proposal receipt, whichever is later. 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.

Special Award Conditions:

All experimental and analytical data generated during the research project, including full documentation of the associated metadata and the complete E-Notebook, will be required to be submitted to the NEES national data repository operated by NEESinc. Data must be submitted in accordance with the data, metadata, and E-Notebook formats and policies established by the earthquake engineering community in the NEESinc *Data Sharing and Archiving Policies and Guidelines.*

Awardees will be required to attend an annual NEES research and education awardees meeting; this meeting will be open to the public.

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:

- Joy M. Pauschke, Program Director, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-7024, fax: (703) 292-9053, email: jpauschk@nsf.gov

Cognizant Program Officer(s):

Ken P. Chong, Program Director, Mechanics and Structures of Materials Program, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-7008, fax: (703) 292-9053, email: kchong@nsf.gov

Yip-Wah Chung, Program Director, Surface Engineering and Material Design Program, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-7476, fax (703), 292-9053, email: ychung@nsf.gov

Richard J. Fragaszy, Program Director, Geomechanics and Geotechnical Systems Program, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-7011, fax: (703) 292-9053, email: rfragasz@nsf.gov

Jesus de la Garza, Program Director, Information Technology and Infrastructure Systems Program, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-7791, fax: (703) 292-9053, email: jgarza@nsf.gov

Jorn Larsen-Basse, Program Director, Infrastructure Materials and Structural Mechanics Program, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-7016, fax (703), 292-9053, email: jlarsenb@nsf.gov

Shih Chi Liu, Program Director, Sensor Technologies for Civil and Mechanical Systems Program, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-7017, fax: (703) 292-9053, email: sliu@nsf.gov

Steven L. McCabe, Program Director, Structural Systems and Hazard Mitigation of Structures Program, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-7003, fax: (703) 292-9053, email: smccabe@nsf.gov

Vilas Mujumdar, Program Director, George E. Brown, Jr. Network for Earthquake Engineering Simulation, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-7262, fax: (703) 292-9053, email: vmujumda@nsf.gov

Joy M. Pauschke, Program Director, George E. Brown, Jr. Network for Earthquake Engineering Simulation, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-7024, fax: (703) 292-9053, email: jpauschk@nsf.gov

Juan Pestana, Program Director, Geoenvironmental Engineering and Geohazards Program, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-7004, fax: (703) 292-9053, email: jpestana@nsf.gov

Kaye Shedlock, Program Director, EarthScope Program, Directorate for Geosciences, Division of Earth Sciences, 785 S, telephone: (703) 292-8556, fax: (703) 292-9025, email: kshedloc@nsf.gov

Kevin Thompson, Program Director, Cyber Trust, NSF Middleware Initiative, and Science of Design Programs, Directorate for Computer and Information Science and Engineering, Division of Shared Cyberinfrastructure, telephone: (703) 292-8962, fax: (703) 292-9060, email: kthompso@nsf.gov

Masayoshi Tomizuka, Program Director, Dynamic Systems and Control Program, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-7012, fax: (703) 292-

9053, email: mtomizuk@nsf.gov

Dennis Wenger, Program Director, Infrastructure Systems Management and Hazard Response Program, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-7014, fax: (703) 292-9053, email: dwenger@nsf.gov

For questions related to the use of FastLane, contact:

- Kimberly J. Bryant, Information Technology Specialist, Directorate for Engineering, Division of Civil & Mechanical Systems, 545 S, telephone: (703) 292-7006, fax: (703) 292-9053, email: kbryant@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 (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
- **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.

The National Science Foundation
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