Nanotechnology Undergraduate Education (NUE)

Program Solicitation

NSF 06-538
***Replaces Document* NSF 05-543**

National Science Foundation
Directorate for Engineering
Division of Engineering Education and Centers
Directorate for Education and Human Resources
Division of Undergraduate Education
Directorate for Social, Behavioral, and Economic Sciences
Division of Social and Economic Sciences

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

May 16, 2006

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Nanotechnology Undergraduate Education (NUE)

Synopsis of Program:

This solicitation aims at introducing nanoscale science, engineering, and technology through a variety of interdisciplinary approaches into undergraduate education. The focus is on nanoscale engineering education with relevance to devices and systems and/or on the social, economic, and ethical issues that surround nanotechnology.

A related program, Active Nanostructures and Nanodevices, is focused on fundamental research in emerging areas of nanoscale science, engineering, and technology. This related program contains two components: Nanoscale Interdisciplinary Research Teams (NIRT) and Nanoscale Exploratory Research (NER). Other research and education projects in nanoscale science and engineering will continue to be supported in the relevant NSF programs and divisions.

Cognizant Program Officer(s):

- Mary F. Poats, Program Manager, Directorate for Engineering, Division of Engineering Education & Centers, 585 N, telephone: (703) 292-5357, fax: (703) 292-9051, email: mpoats@nsf.gov
- Duncan E. McBride, Section Head, Directorate for Education & Human Resources, Division of Undergraduate Education, 835 N, telephone: (703) 292-4630, fax: (703) 292-9015, email: dmcbride@nsf.gov
- Ronald Rainger, Program Director, Directorate for Social, Behavioral & Economic Sciences, Division of Social and Economic Sciences, 995 N, telephone: (703) 292-7283, email: rrainger@nsf.gov

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

- 47.076 --- Education and Human Resources
- 47.041 --- Engineering

- 47.075 --- Social, Behavioral and Economic Sciences

Eligibility Information

- **Organization Limit:** Any U.S. academic institution having undergraduate programs in disciplines usually supported by NSF may submit proposals. Projects may be proposed by individual investigators or by groups from academic institutions. NUE proposals involving more than one institution must be submitted as a single administrative package with the managing Principal Investigator (PI) from the lead institution. Non-U.S. institutions may participate in project activities using their own resources. See Section III of this solicitation for further information.

- **PI Eligibility Limit:** None Specified.
- **Limit on Number of Proposals:** Only one (1) proposal may be submitted by any U.S. academic institution as the lead institution with the following exception: A U.S. academic institution may submit a second proposal as the lead institution, only if it is focused on the societal, ethical, economic and/or environmental implications of nanoscale science and engineering; two (2) proposals focused on these areas are not allowed.

Award Information

- **Anticipated Type of Award:** Standard Grant
- **Estimated Number of Awards:** 8 to 10
- **Anticipated Funding Amount:** $2,000,000 pending the availability of funds. Each award will to up to a maximum of $200,000 for two years.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Full Proposal Preparation Instructions:** This solicitation contains information that supplements 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 by NSF.
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** Not Applicable.

C. Due Dates

- **Full Proposal Deadline Date(s)** (due by 5 p.m. submitter's local time):
  May 16, 2006

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:** Standard NSF award conditions apply.
- **Reporting Requirements:** Standard NSF reporting requirements apply.

TABLE OF CONTENTS

I. INTRODUCTION

One nanometer (one billionth of a meter) is a magical point on the dimensional scale. Nanostructures are at the confluence of the smallest of human-made devices and the largest molecules of living systems known today. Nanoscale science and engineering here refer to the fundamental understanding and resulting technological advances arising from the exploitation of new physical, chemical, and biological properties of systems that are intermediate in size, between isolated atoms and molecules and bulk materials, where the transitional properties between the two limits can be controlled. During the last few years, novel structures, phenomena, and processes have been observed at the nanoscale (from a fraction of a nanometer to about 100 nm) and new experimental, theoretical, and simulation tools have been developed for investigating them. These advances provide exciting opportunities for scientific and technological developments in nanoparticles, nanostructure materials, nanodevices, and systems.

Nanotechnology is the creation and utilization of functional materials, devices, and systems with novel properties and functions that are achieved through the control of matter, atom-by-atom, molecule-by-molecule, or at the macromolecular level. A revolution has begun in science, engineering and technology, based on the ability to organize, characterize, and manipulate matter systematically at the nanoscale. Far-reaching outcomes for the 21st century are envisioned in both scientific knowledge and a wide ranges of technologies in most industries, healthcare, conservation of materials and energy, biology, environment and education. Fundamental research in Nanoscale Science and Engineering (NSE) underpins innovation in critical areas ranging from manufacturing to medicine.

NSE has technological, economic, environmental, social, and ethical dimensions that may change the world in which we live. Increased understanding and appreciation of the potential for nanoscale science and engineering will be needed to create an informed citizenry and a competitive workforce.

The Nanotechnology Undergraduate Education (NUE) program will integrate nanoscale science, engineering, and technology into undergraduate curricula. The NUE program provides funding for projects that will address the educational challenges of these emerging fields and generate practical ways of introducing nanotechnology into undergraduate education with a focus on devices and systems and/or on the social, economic, and ethical issues that surround nanotechnology. Given the worldwide expansion of research and education in nanoscale science and engineering, international collaborations that advance underlying nanoscale science and engineering education goals and strengthen U.S. activities are encouraged.

II. PROGRAM DESCRIPTION

NANOTECHNOLOGY UNDERGRADUATE EDUCATION (NUE)

Program Goals

Advances in nanotechnology research provide new opportunities in undergraduate education. With their focus on imaging and manipulating the atom, the ultimate building block of matter, nanoscale science and engineering provide a multitude of new interdisciplinary teaching opportunities for engaging interest and for broadening vision by students of science, engineering, and technology. Nanoscale science and engineering thus permit new strategies for enhancing science literacy, preparing the workforce for emerging technologies, and attracting a diverse group of talented students to the workforce of tomorrow. The FY 2006 solicitation is focused on nanoscale engineering education with relevance to devices and systems, and/or on the social, economic, and ethical issues that surround nanotechnology.

Nanoscale engineering provides creative opportunities for invigorating undergraduate education through new courses and research experiences. It blends chemistry, physics, biology, mathematics, computer science, materials science, geology, behavioral and social sciences, design and/or engineering. As such, it provides new opportunities for faculty collaboration, both in teaching and in research, that cross traditional disciplinary departmental boundaries. Some examples of nanotechnology-based topics that can be introduced into the curriculum include scanning probe methods, nanotubes, bottom-up and top-down syntheses of nanoscale materials, self-assembly, nanobiotechnology, environmental aspects of nanotechnology, applications of nanotechnology to information technology, properties and fundamental phenomena in nanoscale materials, computational methods for modeling nanoscale materials, nanoscale devices, nanoscale systems, design principles at nanoscale, and the societal, ethical, economic and environmental implications of nanotechnology. See http://www.nsf.gov/nano for additional examples.

NUE projects are intended to enable individuals, departments, programs, or campuses to integrate nanoscale science and engineering into their curricula. Integration could take the form of a new course or courses, or modification of existing courses so that a substantial portion of the course content is based on nanoscale science and engineering. Integration could include a module or modules in courses that focus on issues of environmental or social change and new developments in nanoscale science and engineering, or a new course or series of courses that include those focuses. Proposals involving any part of the undergraduate curriculum are eligible. International collaborations that advance the underlying NUE goals and strengthen U. S. activities are encouraged.

Project Characteristics

NUE emphasizes new approaches to undergraduate education through interdisciplinary collaborations. These collaborations could lead to, but are not limited to:

- New examples of undergraduate science, technology, engineering, and mathematics (STEM) courses that are presented through the development of manuals and other written materials, software, laboratory and demonstration experiments, and web-based resources;
- Development and dissemination of new teaching modules for nanoscale science and engineering of relevance to engineering education that can be used in existing undergraduate STEM courses;
- Incorporation of undergraduate research opportunities based on nanoscale science and engineering into the curriculum at any level; and
- Development of courses or curricular enhancements about nanoscale science, engineering and technology and environmental or social change.

Proposals similar to those defined by this solicitation may also be submitted to the NSF Course, Curriculum, and Laboratory Improvement (CCLI) program managed by the Division of Undergraduate Education. The same proposal, however, cannot be simultaneously submitted to both NUE and the CCLI program.

III. ELIGIBILITY INFORMATION

Nanotechnology Undergraduate Education (NUE)

Any U.S. academic institution having undergraduate programs in disciplines usually supported by NSF may submit proposals. Projects may be proposed by individual investigators or by groups from academic institutions. Synergistic collaboration among researchers and collaborations or partnerships with industry, government laboratories and foreign

institutions are encouraged when appropriate; however, the lead institution must be a U.S. academic instititution as specified above. NUE proposals involving more than one institution must be submitted as a single administrative package with the managing Principal Investigator (PI) from the lead institution. Non-U.S. institutions may participate in project activities using their own resources.

Only one (1) proposal may be submitted by any U.S. academic institution as the lead institution with the following exception: A U.S. academic institution may submit a second proposal as the lead institution, only if it is focused on the societal, ethical, economic and/or environmental implications of nanoscale science and engineering; two (2) proposals focused on these areas are not allowed.

IV. AWARD INFORMATION

It is estimated that about 8-10 standard grants with a total of $2,000,000 will be awarded pending the availability of funds. Each award will be a maximum amount of $200,000 for 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/publications/pub_summ.jsp?ods_key=gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

Additional review criteria described in Section VI. A. should be addressed when preparing a proposal.

1. COVER SHEET

   Proposers are required to identify the relevant proposal component, "Nanotechnology Undergraduate Education," in the block titled "For consideration by NSF organizational unit." The proposal title should begin with component acronym: "NUE". All NUE proposals must be submitted via FastLane to EEC (contact Mary Poats, mpoats@nsf.gov).

2. PROJECT DESCRIPTION

   The project description for NUE proposals should contain the following components:

   a. Goals and Objectives. The goals of the project should be stated clearly and concisely in relation to the goals of the NUE component.

   b. Results of Prior NUE Support. In addition to results of prior support as required by the NSF GPG, institutions participating in prior NUE awards must describe the relationship of that award to this new proposal.

   c. Detailed Project Plan. The project plan should be the longest section of the Project Description. It should include description of the project's features, clearly delineating the plan to introduce or enhance nanotechnology in the undergraduate curriculum and its relevance to engineering education. The plan should include:

      Background on the proposed project describing how it builds on nanoscale and pedagogical research;

Statement describing the expected impact of the project on the undergraduate curriculum at the participating institution(s) and, if applicable, elsewhere;

Number and percentage of undergraduate students who would be impacted by the project at the participating institution(s), and the extent to which under-represented groups would be served;

Plans for institutionalization of projects; and

References to required letter(s) of institutional and departmental commitments to the project noted under Supplementary Material (see below).

d. Experience and Capability of the Principal Investigator(s). Briefly describe the experience and capability of the PI(s). Include a brief description of the rationale for including the specific faculty members and institutional units within the project. State the role of each and cite the expertise that each will contribute to the project.

e. Evaluation Plan. Describe criteria to be used in evaluating the quality and impact of the project, how the project's impact on student learning will be assessed, and the process for collecting and analyzing information at the proposer's institution or from others involved in testing of course materials developed. The following references may be helpful in designing the evaluation plan:

- The 2002 User Friendly Handbook for Project Evaluation (NSF 02-057). See: http://www.nsf.gov/pubs/2002/nsf02057/start.htm
- User Friendly Handbook for Mixed Method Evaluations (NSF 97-153). See: http://www.ehr.nsf.gov/EHR/REC/pubs/NSF97-153/start.htm
- Online Evaluation Resource Library. See: http://oerl.sri.com
- Field-tested Learning Assessment Guide (FLAG). See: http://www.wcer.wisc.edu/nise/CL1/flag/
- SRI Online Evaluation Resource Library. See: http://oerl.sri.com/.

f. Dissemination of Results. Describe plans to communicate the results of the project to other professionals in the STEM and education communities, both during and after the project. Describe the information or materials to be disseminated (e.g., computer presentations, laboratory manuals, software, multimedia materials); how the material will be made available to other institutions; the means of dissemination (e.g., faculty development workshops, journal articles, conference presentations, electronic networks, media); and the procedures for determining the success of the dissemination effort. Describe procedures to be used to maintain the quality and currency of any material developed, to provide support for faculty users, and to publicize the availability of materials.

Investigators are encouraged to use the National Science, Technology, Engineering, and Mathematics Education Digital Library (NSDL), as part of their dissemination efforts, see http://nsdl.org. To ensure that educational materials can be indexed and cataloged within the appropriate collections of NSDL, standard metadata elements and tags should be embedded in web-based products, e.g. documents, animations, simulations, and modules. A variety of review and user annotation procedures are also under development as NSDL services. Information about metadata standards is available from the Dublin Core Metadata Initiative at http://dublincore.org and the NSDL Metadata Primer at http://metamanagement.comm.nsdlib.org/outline.html. The NSDL Communications Portal at http://comm.nsdl.org provides updates of ongoing NSDL efforts and discussions.

3. SUPPLEMENTARY DOCUMENTS

Letter(s) describing the intellectual commitment to the project of institutional and academic department(s) signed by a senior academic officer (dean or above) with authority to implement the activities listed in the proposal (if awarded) must be included as a Supplementary Document(s). The letter(s) should be referenced in the Project Description and outline the school's and department's commitment to the project and how the project may effect a lasting change at the institution. If these signed statements are not included in the Supplementary Documents section of FastLane, the proposal will be returned.

Because this program does not require preliminary proposals, potential PIs are encouraged to contact one

of the NUE Cognizant Program Officers listed in this solicitation before submitting a proposal. The Program Officer will help the PI determine whether the proposed work is appropriate for NUE.

Proposers are reminded to identify the program announcement/solicitation number (06-538) 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 by NSF in proposals submitted under this Program Solicitation.

C. Due Dates

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

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

May 16, 2006

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:

In addition to the two NSF criteria described above, the following elements will be used by reviewers and NSF staff in evaluating all NUE proposals:

- Are the goals and measurable expected outcomes defined and are they appropriate to the scope, scale, and state of the project?
- Does the proposal describe a convincing rationale and appropriate methods that are grounded in the STEM education knowledge base?
- Is there a clear work plan that is aligned with the expected outcomes?
- Is the project likely to produce high quality results that contribute to the undergraduate STEM education knowledge base?
- Is the project likely to have an impact on STEM education, student learning, and faculty practice?
- Are expected results (e.g. modules, curricula) defined and appropriate?
- Is the evaluation plan likely to produce useful formative and summative information?
- Are the plans for project assessment and institutionalization beyond the faculty members involved in the proposal sound?
- What is the extent to which creative, interdisciplinary approaches to nanotechnology undergraduate

education are fostered?

- What is the likelihood that the project will engage students and faculty at participating institutions (and, if applicable, elsewhere) in undergraduate nanotechnology education?
- What is the potential impact on developing a diverse workforce and enhancing science literacy and the scale of the potential impact?

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 are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC). 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.

Consistent with the requirements of OMB Circular A-16, *Coordination of Geographic Information and Related Spatial Data Activities*, and the Federal Geographic Data Committee, all NSF awards that result in relevant geospatial data must be submitted to Geospatial One-Stop in accordance with the guidelines provided at: www.geodata.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/publications/pub_summ.jsp?ods_key=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/.

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

- Mary F. Poats, Program Manager, Directorate for Engineering, Division of Engineering Education & Centers, 585 N, telephone: (703) 292-5357, fax: (703) 292-9051, email: mpoats@nsf.gov
- Duncan E. McBride, Section Head, Directorate for Education & Human Resources, Division of Undergraduate Education, 835 N, telephone: (703) 292-4630, fax: (703) 292-9015, email: dmcbride@nsf.gov
- Ronald Rainger, Program Director, Directorate for Social, Behavioral & Economic Sciences, Division of Social and Economic Sciences, 995 N, telephone: (703) 292-7283, email: rrainger@nsf.gov

For questions related to the use of FastLane, contact:

- Esther M. Bolding, Program Manager, Directorate for Engineering, Division of Engineering Education & Centers, 585 N, telephone: (703) 292-5342, fax: (703) 292-9051, email: ebolding@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 MyNSF News Service (http://www.nsf.gov/mynsf/) 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.