

Innovations in Engineering Education, Curriculum, and Infrastructure (IEECI)

Program Announcement

10-502

Replaces Document(s):

NSF 08-610



National Science Foundation

Directorate for Engineering
Engineering Education and Centers

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

January 20, 2010

Deadline for Area 1 projects

March 31, 2010

Deadline for Area 2 and Area 3 projects

REVISION NOTES

Please be advised that the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) includes revised guidelines to implement the mentoring provisions of the America COMPETES Act (ACA) (Pub. L. No. 110-69, Aug. 9, 2007.) As specified in the ACA, each proposal that requests funding to support postdoctoral researchers must include a description of the mentoring activities that will be provided for such individuals. Proposals that do not comply with this requirement will be returned without review (see the PAPP Guide Part I: *Grant Proposal Guide* Chapter II for further information about the implementation of this new requirement).

As announced on May 21, 2009, proposers must prepare and submit proposals to the National Science Foundation (NSF) using the NSF FastLane system at <http://www.fastlane.nsf.gov/>. This approach is being taken to support efficient Grants.gov operations during this busy workload period and in response to OMB direction guidance issued March 9, 2009. NSF will continue to post information about available funding opportunities to Grants.gov FIND and will continue to collaborate with institutions who have invested in system-to-system submission functionality as their preferred proposal submission method. NSF remains committed to the long-standing goal of streamlined grants processing and plans to provide a web services interface for those institutions that want to use their existing grants management systems to directly submit proposals to NSF.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Innovations in Engineering Education, Curriculum and Infrastructure (IEECI)

Synopsis of Program:

The Innovations in Engineering Education, Curriculum, and Infrastructure (IEECI) program supports research which addresses three aspects of engineering education: (1) how students best learn the ideas, principles, and practices to become creative and innovative engineers, and how this learning is measured (2) how to more effectively translate successes in engineering education research into widespread practice

with consideration of curriculum, student learning, innovation models, and cyber-learning technology, and (3) implementation of programs for students supported by the GI Bill.

Cognizant Program Officer(s):

- Susan C Kemnitzer, telephone: (703) 292-5347, email: skemnitz@nsf.gov
- Sally Wood, 585N, telephone: (703)292-7107, fax: (703) 292-9057, email: slwood@nsf.gov

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

- 47.041 --- Engineering

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 35 to 40 Approximately 10 Area 1 grants are anticipated and approximately 25 to 30 awards are anticipated in Areas 2 and 3.

Anticipated Funding Amount: \$150,000 to \$400,000 The total anticipated funding in FY10 for projects associated with this announcement is \$8,500,000. Funding is contingent upon availability of appropriations. Area 1 projects will be funded at a level of up to \$400,000. Area 2 or 3 projects will be funded at a level up to \$150,000, but projects involving multiple universities may apply for grants up to \$200,000.

Eligibility Information

Organization Limit:

None Specified

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI:

None Specified

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable
- **Preliminary Proposal Submission:** Not Applicable
- **Full Proposal Preparation Instructions:** NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) proposal preparation guidelines apply.

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required under this solicitation.
- **Indirect Cost (F&A) Limitations:** Not Applicable

- **Other Budgetary Limitations:** Not Applicable

C. Due Dates

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

January 20, 2010

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March 31, 2010

Deadline for Area 2 and Area 3 projects

Proposal Review Information Criteria

Merit Review Criteria: National Science Board approved criteria apply.

Award Administration Information

Award Conditions: Standard NSF award conditions apply.

Reporting Requirements: Standard NSF reporting requirements apply.

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I. INTRODUCTION

Engineering education today is facing an unprecedented array of challenges and opportunities. As a national resource that drives economic growth, the quality of engineering education has a direct impact on our ability as a nation to compete in the

increasingly competitive global environment of the 21st century. The National Science Board (Moving Forward to Improve Engineering Education, 2007) emphasizes that "engineering education must change in light of changing workforce demographics and needs." The 21st century engineer must be able to deal with a rapid pace of technological change, a highly interconnected world, and complex problems that require multidisciplinary approaches, systems thinking, and effective use of human and natural resources.

Much has been written about the need to transform engineering education, but potential proposers are asked to pay special attention to:

- The Journal of Engineering Education, Special Issue: Educating Future Engineers: Who, What, and How, July 2008.
- Moving Forward to Improve Engineering Education, National Science Foundation National Science Board, 2007.
- Educating the Engineer of 2020: Adapting Engineering Education to the New Century, National Academy of Engineering, 2005.
- The Engineer of 2020: Visions of Engineering in the New Century, National Academy of Engineering, 2004.

II. PROGRAM DESCRIPTION

The Division of Engineering Education and Centers seeks proposals in the three areas which are described below. Proposals in all areas are required to have the following project features.

Quality, Relevance, and Impact: Projects should address an identified need or opportunity in engineering education, clearly indicate how they will meet this need, and be innovative in their production and use of new materials, processes, and ideas, or in their implementation of tested ones. Projects should be based on an accurate and comprehensive understanding of the disciplinary field and utilize appropriate technology in all learning environments.

The relevant research or knowledge base that supports the effectiveness of the proposed efforts should be included. If innovative strategies are proposed, the proposal should include compelling arguments for why these strategies are expected to produce results. At the end of the project, the Principal Investigator should be able to describe how student learning has changed, and how our knowledge of how students learn has increased.

Expected Measurable Outcomes: Projects should have goals and objectives that have been translated into a set of expected measurable outcomes which can be monitored using quantitative or qualitative approaches or a combination of both. These outcomes should be used to track progress, guide the project, and evaluate its ultimate success.

Project Evaluation: All projects should have an evaluation plan that includes both a strategy for monitoring the project as it evolves to provide feedback to guide these efforts (formative evaluation) and a strategy for evaluating the effectiveness of the project in achieving its goals and for identifying positive and negative findings when the project is completed (summative evaluation). These efforts should be based on the project's specific expected measurable outcomes defined in the proposal and should rely on an appropriate mix of qualitative and quantitative approaches in measuring the outcomes.

Project Reporting: In addition to annual and final reporting requirements, the project results need to be communicated widely to share best practices. Projects should plan to make their results available through the NSF-sponsored National STEM Digital Library. Those receiving awards are required to participate in annual grantee meetings.

Area 1. Innovations in Teaching and Learning

Projects will be supported that contribute to significant breakthroughs in understanding how students learn engineering so that our undergraduate and graduate programs prepare engineers to meet the needs of the changing economy and society. Specifically, we are interested in research that addresses the following:

- Engineering Epistemologies: Research on what constitutes engineering thinking and knowledge within current and future social and economic contexts.
- Engineering Learning Mechanisms: Research on engineering learners' developing knowledge and competencies in context, with special interest in evolving areas such as service learning, systems level thinking, design, sustainability, and the intersection of biology and engineering.
- Engineering Learning Systems: Research on the instructional culture, institutional infrastructure, and epistemology of engineering educators. Of special interest here is research on effective learning systems for personalized learning, one of the NAE Grand Challenges for Engineering (<http://www.engineeringchallenges.org/>).
- Engineering Diversity and Inclusiveness: Research on how diverse human talents contribute solutions to the social and global challenges and relevance of the profession.
- Engineering Entrepreneurship: Research on innovation and the development of entrepreneurial behavior.
- Engineering topics from previous IEECI exploratory areas:

1. Educational Opportunities Using Cyberinfrastructure and Virtual or Mixed Reality
2. Integrating Sustainability into Engineering Education
3. Future Directions for U.S. Doctoral Programs
4. Strategic Supply-Chain Partnerships for Engineering and Technology Programs

5. Insights into the Business of Engineering Education

Research teams submitting proposals to the Innovations in Teaching and Learning topic must include at least one tenured engineering faculty with an exemplary teaching record so that the research project will be informed by experienced and successful practitioners. This will also facilitate dialogue between researchers and the practitioners in the classroom and provide an early path for dissemination.

Area 1 projects must also have all the features described at the beginning of this program description section.

Area 2. Translation of Engineering Education Research into our Classrooms

Research results in engineering education often face significant barriers to widespread adoption into practice. While the economic challenge of translating research to innovation is well studied for other fields of engineering and the chasm between has been labeled "the valley of death," for engineering education research there are additional challenges and the "commercialization" process is much more complex. In the United States there are about 22,000 engineering faculty and approximately 600,000 engineering undergraduate and graduate students. These are populations for which research and innovation in engineering education ultimately should be manifested in improved learning and productivity. In a recent editorial in the Journal of Engineering Education on how research fits into engineering education, Karan Watson emphasized that "Research is necessary, but without translation into changes in faculty, courses and curriculum, it will not produce called for changes." The importance of sharing information and building community was stressed by Fincher's statement in an editorial that "We cannot afford at this stage in the growth of the field, to become disassociated with the very people we hope our work will influence and advantage."

In "Creating a Culture for Scholarly and Systematic Innovation in Engineering Education," Jamieson and Lohman investigate the important issue of how to connect discoveries about how people learn with the practice of engineering education. They note that although it is well known that "higher levels of performance in any field...are achieved by continual cycles of innovation that are ...addressed systematically based on solid research and proven practices," these innovation cycles are not characteristic of today's practice of engineering education. More typically faculty innovate based on "reflection and intuition drawn from their teaching experiences" rather than documented research findings. In the context of "the pace, scale, and complexity of the global challenges ahead" there is a question as to whether this intuitive approach "has the requisite efficiency and effectiveness to lead to the educational experiences needed to prepare excellent graduates in the future."

Area 2 research projects will be supported which identify significant barriers to the adoption of demonstrated successful research in engineering education and propose ways to remove or overcome these barriers so that the research results can be more effectively translated into practice. Some examples of possible projects are:

- Transfer of specific research results to broad application with demonstrated improvement in learning: These projects may take a case study approach to discover the important factors necessary for broad adoption. The impact on different student populations and learning environments should be considered.
- Identification of characteristics of faculty and their environments which facilitate successful adaptation of new methodologies.
- Improvements in assessments and communication: A significant barrier may be lack of faculty awareness of and confidence in engineering education innovations. Projects may focus on assessments based on confirmed learning theory that can be replicated and demonstrate that learning objectives are more effectively met. Projects may also focus on more effective communication among practitioners about successful implementations.
- Effective use of technology: Projects may demonstrate improved learning using communication, networking, and computation technology with low barriers to widespread adoption.
- Business model of engineering education: Projects may develop new models that show the relationship between improved student learning, resource allocation, and institutional success. How will those faculties who adopt and translate contemporary research into their classroom be more successful? Is the prospect of improved faculty success one bridge over the "valley of death"?
- Innovation and "commercialization" model: Projects may explore the basic impediments to crossing the "valley of death" for engineering education research that will advance understanding of what "commercialization" means for engineering education research.

Area 2 projects must also have all the features described at the beginning of this program description section. The following publications may be useful.

- "Creating a Culture for Scholarly and Systematic Innovation in Engineering Education: Ensuring U.S. engineering has the right people with the right talent for a global society," Phase 1 Report, Jamieson and Lohman, ASEE, 2009. Partially funded by NSF EEC-0743223
- "Acceptance and Diffusion of Innovation: A Cross Curricular Perspective on Instructional and Curricular Change in Engineering" 2006. Roberta M. Spalter-Roth, Norman Fortenberry, and Barbara Lovitts. American Sociological Association and the Center for the Advancement of Scholarship on Engineering Education of the National Academy of Engineering. Funded by NSF through SES-0523255.
- "Change in Engineering Education: Where Does Research Fit?" 2009. Karan Watson, Journal of Engineering Education, 98(1): 3-4.
- "Useful Sharing" 2009. Sally Fincher, Journal of Engineering Education, 98(2):109-110.
- "Valleys of Death and Darwinian Seas: Financing the Invention to Innovation Transition in the United States," 2003, Philip E. Auerwald and Lewis M. Branscomb, Journal of Technology Transfer, 28, 227-239 Kluwer Academic Publishers.

- "A Valley of Death in the Innovation Sequence: An Economic Investigation," 2007, George S. Ford, Thomas M. Koutsky, and Lawrence J. Spiwak, Phoenix Center for Advanced Legal and Economic Public Policy Studies. <http://ssrn.com/abstract=1093006>.
- Fostering Learning in the Networked World, NSF, 2008
- Cyberinfrastructure Vision for 21st Century Discovery, NSF, 2007

Area 3. Implementation of Programs for Students Supported by the GI Bill.

In August 2009, the new program of educational benefits for veterans of the U.S. armed forces who served on active duty after September 10, 2001 went into effect. The program greatly expands the post-secondary educational benefits to cover tuition, housing, and a stipend for books and supplies. It also creates a tremendous opportunity for the United States to expand its technical workforce while serving veterans. As the President stated recently, the new GI Bill is "not simply a debt that we are repaying to the remarkable men and women who have served. It is an investment in the future of our own country." The President's complete remarks are available at http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-on-the-Post-9/11-Gi-Bill-at-George-Mason-University/

In April 13-14, 2009, the NSF's Division of Engineering Education and Centers sponsored a workshop to generate ideas on how to encourage post-9/11 veterans to use the new benefit toward educational opportunities that lead to careers in engineering. The workshop report, entitled "Veterans' Education for Engineering and Science", describes the new veterans benefit, examines the population it will serve and outlines recommendations. The report can be found at <http://www.nsf.gov/div/index.jsp?div=EEC>.

Area 3 research projects will be supported which help Schools of Engineering get ready to serve veterans. Proposals should include some or all of the features of an exemplary education and career development program for veterans such as:

- Providing year-round, start-to-finish program support for veteran students by providing customized curriculum which appropriately credits their military training and community college coursework.
- Organizational efforts to supplement the 36 months of academic support provided through the new GI bill with internships provided by industry and research activities provided by the university.
- Encouraging innovative ways to support networking of veterans and the services they will need.
- Cultivating external relationships established for the veterans that are intended to directly impact their career opportunities.
- Celebrating the special attributes of veterans that recognize their unique attributes as a community of interest.
- Institutionalizing the organizational model that is put in place to oversee and direct the integrated program being offered.

Proposals must include commitments from potential employers and educational partners such as community colleges. Each must include planning for how to sustain the program after this grant. In addition, Area 3 projects must have all the features described at the beginning of this program description section.

Before submitting, it would be wise to check the workshop report, the President's remarks and the myriad of resources at the American Council on Education including their recent report entitled "From Soldier to Student: Easing the Transition of Service Members on Campus." See <http://www.acenet.edu/AM/Template.cfm?Section=Home>.

III. AWARD INFORMATION

Anticipated Type of Award: Standard Grant or Continuing Grant Estimated Number of Awards: 35 to 40: Approximately 10 Area 1 grants are anticipated and approximately 25 to 30 awards are anticipated in Areas 2 and 3. Anticipated Funding Amount: \$150,000 to \$400,000: The total anticipated funding in FY10 for projects associated with this announcement is \$8,500,000. Funding is contingent upon availability of appropriations. Area 1 projects will be funded at a level of up to \$400,000. Area 2 or 3 projects will be funded at a level up to \$150,000, but projects involving multiple universities may apply for grants up to \$200,000.

IV. ELIGIBILITY INFORMATION

The categories of proposers eligible to submit proposals to the National Science Foundation are identified in the [Grant Proposal Guide](#), Chapter I, Section E.

Organization Limit:

None Specified

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI:

None Specified

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal Preparation Instructions: Proposals submitted in response to this program announcement should be prepared and submitted in accordance with the guidelines specified 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-PUBS (7827) or by e-mail from nsfpubs@nsf.gov.

Proposers are reminded to identify the program announcement number (Populated with NSF Number at Clearance) in the program announcement block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost Sharing: Cost sharing is not required under this solicitation.

C. Due Dates

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

January 20, 2010

Deadline for Area 1 projects

March 31, 2010

Deadline for Area 2 and Area 3 projects

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this program announcement through use of the NSF FastLane system. Detailed instructions regarding the technical aspects of proposal preparation and submission via FastLane are available at: <http://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact (s) listed in Section VIII of this funding opportunity.

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. Further instructions regarding this process are available on the FastLane Website at: <https://www.fastlane.nsf.gov/fastlane.jsp>.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program where they will be reviewed if they meet NSF proposal preparation requirements. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with the oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal.

A. NSF Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board (NSB)-approved merit review criteria: intellectual merit and the broader impacts of the proposed effort. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two NSB-approved merit review criteria are listed below. 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 the reviewer is qualified to make judgements.

What is the intellectual merit of the proposed activity?

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative, original, or potentially transformative 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?

Examples illustrating activities likely to demonstrate broader impacts are available electronically on the NSF website at: <http://www.nsf.gov/pubs/gpg/broaderimpacts.pdf>.

Mentoring activities provided to postdoctoral researchers supported on the project, as described in a one-page supplementary document, will be evaluated under the Broader Impacts criterion.

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

Integration of Research and Education

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

Integrating Diversity into NSF Programs, Projects, and Activities

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

B. Review and Selection Process

Proposals submitted in response to this program announcement will be reviewed by Ad hoc Review 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.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director accepts the Program Officer's 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 Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

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 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.B. 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 (GC-1); * or Research Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

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

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the *NSF Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period. (Some programs or awards require more frequent project reports). Within 90 days after expiration of a grant, the PI also is required to submit a final project report.

Failure to provide the required annual or final project reports will delay NSF review and processing of any future funding increments as well as any pending proposals for that PI. 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. Such reports provide information on activities and findings, project participants (individual and organizational) 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.

Submission of the report via FastLane constitutes certification by the PI that the contents of the report are accurate and complete.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Susan C Kemnitzer, telephone: (703) 292-5347, email: skemnitz@nsf.gov
- Sally Wood, 585N, telephone: (703)292-7107, fax: (703) 292-9057, email: slwood@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.

IX. OTHER INFORMATION

The NSF Website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this Website by potential proposers is strongly encouraged. In addition, National Science Foundation Update is a free e-mail subscription service designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Regional Grants Conferences. Subscribers are informed through e-mail when new publications are issued that match their identified interests. Users can subscribe to this service by clicking the "Get NSF Updates by Email" link on the [NSF web site](#).

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this new mechanism. Further information on Grants.gov may be obtained at <http://www.grants.gov>.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 40,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

Facilitation Awards for Scientists and Engineers with Disabilities provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

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: nsfpubs@nsf.gov
 - or telephone: (703) 292-7827

- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

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