

Research on Gender in Science and Engineering (GSE)

Program Solicitation

09-511

Replaces Document(s):

NSF 07-578



National Science Foundation

Directorate for Education & Human Resources
Division of Human Resource Development

Letter of Intent Due Date(s) (*required*) (due by 5 p.m. proposer's local time):

February 02, 2009

Research Proposals - Required Letter of Intent

February 09, 2009

Extension Services Proposals - Required Letter of Intent

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

February 24, 2009

Innovation through Institutional Integration (I3)

March 30, 2009

Research Proposals

April 06, 2009

Extension Services Proposals

April 06, 2009

Diffusion of Research-Based Innovation Proposals

August 25, 2009

Innovation through Institutional Integration (I3)

REVISION NOTES

A revised version of the *NSF Proposal & Award Policies & Procedures Guide (PAPPG)*, [NSF 09-1](#), was issued on October 1, 2008 and is effective for proposals submitted on or after January 5, 2009. Please be advised that the guidelines contained in [NSF 09-1](#) apply to proposals submitted in response to this funding opportunity. Proposers who opt to submit prior to January 5th, 2009, must also follow the guidelines contained in [NSF 09-1](#).

One of the most significant changes to the PAPPG is implementation of the mentoring provisions of the America COMPETES Act. Each proposal that requests funding to support postdoctoral researchers must include, as a

separate section within the 15-page project description, a description of the mentoring activities that will be provided for such individuals. Proposals that do not include a separate section on mentoring activities within the Project Description will be returned without review (see the PAPP Guide Part I: *Grant Proposal Guide* Chapter II.C.2. d for further information).

Research and Extension Services proposals now have a required Letter of Intent which replaces the previous preliminary proposal requirement.

A track for *Innovation through Institutional Integration (I³)* is included. I³ challenges faculty, administrators, and others in institutions to think strategically about the creative integration of NSF-funded awards and is itself an integrative, cross-cutting effort within the Directorate for Education and Human Resources (EHR). For Fiscal Year 2009, proposals are being solicited in nine EHR programs that advance I³ goals:

Centers of Research Excellence in Science and Technology (CREST)
Research on Gender in Science and Engineering (GSE)
Historically Black Colleges and Universities Undergraduate Program (HBCU-UP)
Innovative Technology Experiences for Students and Teachers (ITEST)
Alliances for Broadening Participation in STEM: Louis Stokes Alliances for Minority Participation (LSAMP)
Math and Science Partnership (MSP)
Robert Noyce Teacher Scholarship Program
Research in Disabilities Education (RDE)
Tribal Colleges and Universities Program (TCUP)

All proposals submitted to I³ through these programs have a common due date and will be reviewed in competition with one another. Eligibility is limited to institutions of higher education (including two- and four-year colleges). If the proposal is exclusively for I³ STEM educational or related research, then all categories of proposers identified in the NSF Grant Proposal Guide are eligible to submit. Given the focus on institutional integration, an institution may submit only one proposal to the I³ competition for each deadline.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Research on Gender in Science and Engineering FY 2009 (GSE)

Synopsis of Program:

The Research on Gender in Science and Engineering program supports efforts to understand and address gender-based differences in science, technology, engineering, and mathematics (STEM) education and workforce participation through research, the diffusion of research-based innovations, and extension services in education that will lead to a larger and more diverse domestic science and engineering workforce. Typical projects will contribute to the knowledge base addressing gender-related differences in learning and in the educational experiences that affect student interest, performance, and choice of careers; how pedagogical approaches and teaching styles, curriculum, student services, and institutional culture contribute to causing or closing gender gaps that persist in certain fields. Projects will communicate and apply findings, evaluation results, and proven good practices and products to a wider community.

The Research on Gender in Science and Engineering program has been funding these objectives since 1993, under the prior names "Program for Women and Girls" (PWG), "Program for Gender Equity in Science, Mathematics, Engineering and Technology" (PGE), and "Gender Diversity in STEM Education" (GDSE). The program continues to seek to broaden the participation of girls and women in all fields of STEM education.

The program does not currently fund intervention or education projects that directly serve students as their primary purpose. Research projects may involve an intervention with students as subjects only if the intervention is an integral part of gathering data and if the findings from the intervention would substantially answer the research questions posed within the context of theory and hypotheses. There should be meaningful control groups also included in the design. Those wishing to undertake direct intervention or education service projects are encouraged to search the NSF web

site and other publications for appropriate funding programs. Please see section IX below for suggested programs to consult.

Innovation through Institutional Integration (I³) projects enable faculty, administrators, and others in institutions to think and act strategically about the creative integration of NSF-funded awards, with particular emphasis on awards managed through programs in the Directorate for Education and Human Resources (EHR), but not limited to those awards. For Fiscal Year 2009, proposals are being solicited in nine EHR programs that advance I³ goals: CREST, GSE, HBCU-UP, ITEST, LSAMP, MSP, Noyce, RDE, and TCUP.

Cognizant Program Officer(s):

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

- 47.076 --- Education and Human Resources

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 15 to 22 GSE grants per year; a mix of Research Awards, Diffusion of Research-based Innovations Awards, and Extension Services Awards. Research grants will be up to 3 years. Diffusion of Research-based Innovations grants will be up to 3 years. Extension Services grants are for five years, with years 4 and 5 depending on performance. Up to 12 continuing awards will be made in the Innovation through Institutional Integration (I³) activity for the February 24, 2009, competition, pending availability of funds. Up to 12 continuing I³ awards will also be made in Fiscal Year 2010 for the August 25, 2009, competition, pending availability of funds.

Anticipated Funding Amount: \$5,000,000 for new grants in all GSE tracks, pending availability of funds. \$10,000,000 for Innovation through Institutional Integration (I³) projects across multiple EHR programs for each of Fiscal Years 2009 and 2010, pending the availability of funds

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- No limits specified for GSE proposals

Eligibility for Innovation through Institutional Integration (I³) is limited to institutions of higher education (including two- and four-year colleges) accredited in, and having a campus located in the US. If the proposal is exclusively for I³ STEM educational or related research, then all categories of proposers identified in the NSF Grant Proposal Guide are eligible to submit.

PI Limit:

None specified for GSE.

The Principal Investigator for an Innovation through Institutional Integration (I³) proposal must be the university provost or equivalent chief academic officer or president, unless the proposal is exclusively for I³ STEM educational or related research.

Limit on Number of Proposals per Organization:

No limit for GSE.

For Fiscal Year 2009, proposals are being solicited in nine EHR programs that advance the goals of Innovation through Institutional Integration (I³): CREST, GSE, HBCU-UP, ITEST, LSAMP, MSP, Noyce, RDE, and TCUP. Given the focus on institutional integration, an institution may submit only one proposal to

the I³ competition for each deadline.

Limit on Number of Proposals per PI:

None Specified

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is required. Please see the full text of this solicitation for further information.
- **Preliminary Proposal Submission:** Not Applicable
- **Full Proposals:**
 - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. 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.
 - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: <http://www.nsf.gov/pubs/policydocs/grantsgovguide607.pdf>)

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required under this solicitation.
- **Indirect Cost (F&A) Limitations:** Not Applicable
- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

- **Letter of Intent Due Date(s) (required)** (due by 5 p.m. proposer's local time):

February 02, 2009

Research Proposals - Required Letter of Intent

February 09, 2009

Extension Services Proposals - Required Letter of Intent

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

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April 06, 2009

Diffusion of Research-Based Innovation Proposals

August 25, 2009

Innovation through Institutional Integration (I3)

Proposal Review Information Criteria

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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I. INTRODUCTION

One of the National Science Foundation's (NSF) key strategic goals is to cultivate a world-class, broadly inclusive science and engineering workforce, and expand the scientific literacy of all citizens. Investments are directed through programs that strengthen scientific and engineering (S&E) research potential and education efforts at all levels. These outcomes are essential to the U.S. as we progress toward an increasingly technological job market and a scientifically complex society.

The Division of Human Resource Development (HRD) manages a portfolio of programs that aims to broaden the participation of traditionally underrepresented groups in science, technology, engineering and mathematics (STEM) learning and in the STEM workforce. Programs are in place to address the learning, interest and participation of women, underrepresented minorities (African Americans, Alaska Natives, American Indians, Hispanics, Native Hawaiians and other Pacific Islanders), and people with disabilities, at all academic and professional levels.

The program for Research on Gender in Science and Engineering (GSE) seeks to build resources—developing the nation's knowledge capital, social capital, and human capital—toward the goal of broadening the participation of girls and young women in STEM education from kindergarten through undergraduate education.

- **Research projects:** investigate gender-based factors that impact learning and choice in STEM education and the workforce; societal, formal and informal educational systems' interaction with individuals that encourage or discourage interest and persistence in study or careers in certain STEM fields along gender lines.
- **Diffusion of Research-Based Innovation projects:** provide a mechanism for informing a wider audience of practitioners (e.g., teachers, faculty, guidance counselors, parents, etc.) about research findings and strategies for changing educational practice.
- **Extension Services:** create a cadre of extension service agents through training and consulting services to inform educators and other practitioners about and enable them to adopt and embed proven gender-inclusive policies and practices in pedagogy, the design of curriculum materials, student support programs, educator and faculty development. Extension services employ a "train-the-trainer" model and are based on a "unified program of change" that includes research-based and evaluated educational practices.

The program does not currently fund intervention or education projects that directly serve students as their primary purpose. Research projects may involve an intervention with students as subjects only if the intervention is an integral part of gathering data and if the findings from the intervention would substantially answer the research questions posed within the context of theory and hypotheses. There should be meaningful control groups also included in the design. Those wishing to undertake direct intervention or education service projects are encouraged to search the NSF web site and other publications for appropriate funding programs. Please see section IX below for suggested programs to consult.

In addition, proposals submitted to the Innovation through Institutional Integration (I³) track would request support for projects that enable faculty, administrators, and others in institutions to think and act strategically about the creative integration of NSF-funded awards, with particular emphasis on awards managed through programs in the Directorate for Education and Human Resources (EHR), but not limited to those awards. For Fiscal Year 2009, proposals are being solicited in nine EHR programs that advance I³ goals: CREST, GSE, HBCU-UP, ITEST, LSAMP, MSP, Noyce, RDE, and TCUP.

II. PROGRAM DESCRIPTION

A. BACKGROUND

The issues underlying the need for the Research on Gender in Science and Engineering Program include:

- Our society—as experienced in education through parents, the media, K-12 educators, post-secondary faculty and others—tends to reinforce traditional assumptions about the capabilities, interests, and career options for girls and women, steering them away from STEM classes, majors and careers. (See Ceci & Williams, 2007; Jacobs et al. 2005; Steinke, 1997; Tiedemann, 2002; Valian, 1998; Etzkowitz et al., 2000; Clewel & Campbell, 2002).
- At the same time, the demand for science and technology literacy on the part of all citizens has never been higher, and the demand for domestic workforce capacity in engineering and computer fields is projected to exceed supply. (See National Science Board, 2003; Congressional Commission on the Advancement of Women and Minorities in Science Engineering and Technology Development, 2000; National Academy of Sciences, 2005).
- The history of S&E design suggests that optimal performance of S&E in the service of society is enhanced by inquiry, discovery, and design that are informed by diverse points of view and diverse research questions. If significant populations are not represented, the results may range from being simply inadequate to potentially dangerous to some subpopulations. Margolis and Fisher (2002) outline many of the design problems that stemmed from all (or predominately) male design teams, including voice recognition systems that could not "hear" women's voices, video conferencing systems that ignored women for the same lack of "hearing," automotive airbags designed for male-sized humans that injured and even killed many women, and artificial heart valves sized for the male heart.

- Gender biases are still evident in gender gaps at many stages of the STEM educational continuum. While both boys and girls now enroll in elective and advanced high school courses to prepare for college at about the same frequency, and the gender gap in mathematics scores has disappeared, girls are still less likely to report liking math or science. In some fields, such as computer science, boys accounted for 83 percent of those taking the Advanced Placement exam in 2007, and received higher average scores than their female counterparts. (Freeman 2004, CollegeBoard 2008, Hyde et al, 2008)
- While young women are attending college at higher rates than ever before and make up over half of the undergraduate populations at many colleges and universities, differential course taking and the preference for non-STEM fields in high school has led to significant differences between men and women in terms of education and career aspirations and outcomes. College-age women are less likely to express interest in STEM majors at the undergraduate level, and the retention of female students in some STEM fields during undergraduate and graduate study is significantly lower than male students. This has led to fewer women graduating with degrees in the fields of the greatest national need (e.g., science and engineering fields), and those women who make it through the education system with STEM degrees leave the science and engineering workforce at one and a half to two times the rate of their male counterparts (Preston, 2004; Clewell & Campbell, 2002; Freeman, 2004, Watt and Eccles, 2008).
- Socially projected stereotypes about who should be scientists and engineers pose artificial limits on the participation of talented students. Gender is only one of the characteristics that shape personal and group identity. Other characteristics such as race, ethnicity, economic status, religion, and disability also bear on whether students are encouraged, neglected, or discouraged from developing certain skills and ambitions. Our educational systems must seek to develop talent and interest in science, mathematics, and technology in all children.

Statistical profiles of STEM participation, with analyses, are documented in *Trends in Educational Equity of Girls and Women* (Catherine E. Freeman, National Center for Education Statistics, U. S. Department of Education, NCES 2005-016) and the publication [Women, Minorities, and Persons with Disabilities in Science and Engineering](#) (National Science Foundation, NSF 07-315) among others.

B. GOALS

The goal of GSE is to support efforts to understand and address gender-based differences in STEM education and workforce participation through research, the diffusion of research-based innovations, and extension services in education that will lead to a larger and more diverse domestic science and engineering workforce. Ultimately, the program hopes to advance efforts to support the participation of women and girls in STEM fields where they continue to be underrepresented. In the context of that overarching goal, the GSE program supports activities that address the following types of objectives.

Research

- To discover and describe gender-based differences and preferences in learning science, engineering, technology and mathematics in K-16 and factors that affect interest, performance, and choice of STEM study and careers in fields where there are significant gender gaps;
- To discover and describe how experiences and interactions in informal and formal educational settings inhibit or encourage interest and performance of students based on gender;
- To increase the knowledge about organizational models that lead to more equitable and inviting STEM educational environments in K-16;
- To increase the knowledge of the process of institutional change required to achieve more equitable and inviting STEM educational environments in K-16.

Diffusion of Research-Based Innovations

- To extend to significant audiences awareness and information about research-based and demonstrated strategies and practices to increase the participation of girls and women in STEM education and workforce, in order to inform educational practice. These audiences may include educational practitioners, other significant practitioner communities, parents, administrators, faculty and others who have a significant influence on students' education and career plans.
- To catalyze new thinking and future action among educational institutions and/or other organizations by convening training sessions, conferences, workshops, or symposia that are not possible at regular meetings of professional societies.

Extension Services

- To integrate various findings about gender in science and engineering into a unified program of change or to facilitate the interpretation of research knowledge into practice;
- To provide training and consulting services that will develop a cadre of extension service agents that will reach significant practitioner communities. These extension service agents will be able to explain in clear language the practical meaning and benefits of adopting programs, tools, or approaches that enhance the interest and persistence of female students in STEM studies.
- To show educators, from kindergarten through the undergraduate level, how to adapt exemplary projects, research-based learning tools, pedagogical approaches, and service or support programs.
- To communicate to researchers the problems that practicing educators find most urgent or troublesome in adopting the new methods or tools. (cf. Wilson & Daviss, 1994, pp. 17-20)

The program does not currently fund intervention or education projects that directly serve students as their primary purpose. Research projects may include interventions that involve students as subjects only if the intervention is an integral part of gathering data and if the findings from the intervention would substantially answer the research questions posed within the context of theory and hypotheses. There should be meaningful control groups also included in the design. Those wishing to undertake direct intervention or education service projects are encouraged to search the NSF web site and other publications for appropriate funding programs. Please see section IX below for suggested programs to consult.

C. DESCRIPTION - RESEARCH PROPOSALS

Proposals in the Research area may seek to enhance the multidisciplinary understanding of STEM learning to the extent that differences are evident based on gender. Gender should be the major variable in the analysis. Behavioral, cognitive, affective, and social differences may be investigated using methods of sociology, psychology, anthropology, economics, statistics, and other social and behavioral science and education disciplines.

Successful proposals will incorporate relevant advances in research methodologies and theoretical models. They should capitalize on the development of new instrumental, computational, or statistical methods, models, and tools of observation and analysis.

According to the National Research Council report, *Scientific Research in Education*, educational research projects should:

1. pose significant questions that can be investigated empirically;
2. link relevant research to theory;
3. use methods that permit direct investigation of the questions posed;
4. provide a coherent and explicit chain of reasoning;
5. replicate and generalize across studies; and
6. disclose research to encourage professional scrutiny and critique. (National Research Council, 2002)

All research proposals should, therefore, present the disciplinary (or interdisciplinary) and conceptual framework for the study. They should include a discussion of the theory or theories grounding the research and outline research questions and testable hypotheses. The proposal should discuss in detail the methods used to test the hypotheses, and if a population sample is used, this should be described along with the rationale for sample selection, and the project's access to the sample population. The proposal should address whether the design is premised on special needs and interests due to educational level, race, ethnicity, economic status, or disability, in addition to gender, and to what extent data will be disaggregated for multiple characteristics. The results should be expected to be of sufficient significance to merit peer-review and publication.

The effort should provide a research foundation for educational approaches, curriculum, and technological tools that are already developed or can be developed in the future, bridging research and educational practice in settings such as classrooms, informal learning sites, and technological learning environments. The research foundation is assumed to provide a strong base of support for sustained improvement in STEM educational practice. Strong research designs will produce rigorous, cumulative, reproducible, and usable findings.

Suggested topics may include but are not limited to:

- Investigate whether students have gender-based learning differences that are not accommodated by traditional approaches to STEM teaching. For example, different conceptual strengths and weaknesses in learning certain mathematics skills, different retention patterns, different preferences among computer interface features, different interests in social interaction while learning, and different interests in the social relevance and application of science experiments.
- Explore whether social and psychological behavior patterns of females and/or males in our society affect learning in STEM fields.

- Explore the socialization of males and females in our society that might preclude or inhibit access, encouragement, support, or acceptance for interest in STEM topics. For example, assumptions or gender schema about appropriate careers, assumptions about the use of tools and technology, assumptions about the difficulties of embarking on or succeeding in a science or technology career.

Outreach and Communication: Research proposals should address communicating findings to a national audience, **particularly to education practitioners**. Since the goal of the program is to contribute to a national knowledge base, it is important to show that the investigator is aware of appropriate channels -- specific peer-reviewed journals, publications, web sites, professional association conferences -- and is committed (including allocating resources) to make sure that the investment in the project leads to this contribution and that peers in the community will benefit.

Project Evaluation: All GSE projects should include in the project a plan for using benchmarks, indicators, logic models, roadmaps or other evaluative methods to document progress toward goals, objectives and outcomes defined in the proposal. All projects should include some consultation with an external evaluator about the kinds of data and data analysis appropriate for assessing the intellectual merit and broader impacts of the project. All projects are expected to track and report in detail their accomplishment of proposed targets for broader impacts and intellectual merit. The budget should include resources for evaluation and assessment. Evaluation plans should be appropriate for the scope of the project.

The following references may be helpful in designing an evaluation plan:

- The 2002 User-Friendly Handbook for Project Evaluation (NSF 02-057) (<http://www.nsf.gov/pubs/2002/nsf02057/start.htm>).
- FOOTPRINTS: Strategies for Non-Traditional Program Evaluation (NSF 94-51) (<http://nsf.gov/pubs/1995/nsf9541/index.jsp>).
- Online Evaluation Resource Library (<http://oerl.sri.com>).
- Field-tested Learning Assessment Guide (FLAG) (<http://www.wcer.wisc.edu/nise/CL1/flag>).
- Evaluation Handbook, W.K. Kellogg Foundation (<http://www.wkkf.org/Pubs/Tools/Evaluation/Pub770.pdf>).

D. DESCRIPTION – DIFFUSION OF RESEARCH-BASED INNOVATION PROPOSALS

Diffusion of Research-Based Innovation projects provide a mechanism for informing a wider audience (e.g., teachers, faculty, guidance counselors, parents) about issues, research findings, and strategies for changing educational practice. Diffusion proposals must justify a significant investment to reach a regional audience or national attention.

Suggested diffusion projects may include but are not limited to:

- Organize training sessions to consolidate knowledge about educational practice related to male or female students in K-16 STEM at a certain educational level. Workshops on recruitment and retention in undergraduate engineering departments, or symposia on strategies for strengthening recruitment of students into computer science are examples. Training would target education practitioners and other adult populations. Proposals should include participants from a wide variety of institutions/organizations (i.e., more than one institution or organization) and a significant national or regional audience (regional is defined as more than one state or territory).
- Develop a media presentation (e.g., radio, TV, video, web) that educates practitioner communities and/or the public about girls' and/or boys' education in STEM and factors contributing to interest, performance, or choice of careers, and train practitioners in how to use the materials.
- Significantly enhance distribution of an educational product (e.g., book, curriculum guide, seminar manual, web site) through training and by using economically and technologically strategic methods given the target audience.
- Target subgroups of education practitioners (e.g. heads of science departments, deans, heads of research groups, teachers or faculty in a particular field) with training and information about gender equitable practices or issues.

Broadening Participation Partnerships: Broadening participation of underrepresented groups in the sciences and engineering has long been a priority at the National Science Foundation (NSF) and is referenced in major policy documents, including the Proposal and Award Policies and Procedures Guide (NSF 08-1), the NSF Strategic Plan (NSF 06-48), and the NSF Budget Request.

The GSE program seeks to foster collaborations across institutions, geographical regions, and various populations within the United States, its districts and territories in order to ensure broad diffusion of gender-equity research and practices in STEM. All proposals submitted to GSE are already intended to broaden participation in STEM. Proposals that, in addition, include a partnership with institutions serving underrepresented populations may request up to \$100,000 more (for a total of \$350,000) for Diffusion of Research-Based Innovation activities. The partnership must include one or more Co-PIs from the partnering

institutions and the partnering institution should receive significant funds in the budget either as a sub-award or as a collaborative proposal.

A list of types of institutions that may qualify as partners for Broadening Participation Partnerships follows. All institutions must be accredited and award degrees in STEM fields. Enrollments are based on the Integrated Postsecondary Education Data System (IPEDS) data reported in the last two years. **Proposers should supply evidence that partnering institutions qualify as one of the following:**

- Alaska Native Serving Institutions – Accredited institutions of higher education (IHEs) that award associate or bachelor level degrees that have a 20 percent or greater enrollment of Alaska Native undergraduate students.
- Hispanic Service Institutions – Accredited IHEs that award associate or bachelor level degrees and have a 25 percent full-time equivalent (FTE) enrollment of Hispanic undergraduate students.
- Historically Black Colleges and Universities – Identified in the Higher Education Act of 1965, as amended, as any accredited historically black college or university that was established prior to 1964, whose principal mission was, and is, the education of black Americans.
- Institutions Serving People with Disabilities – Accredited IHEs dedicated to serving people with disabilities including but not limited to: Gallaudet University, Landmark College, and National Technical Institute for the Deaf.
- Majority Minority Serving Institutions – Accredited IHEs that award associate or bachelor level degrees whose enrollment of the following minorities (1) American Indian, (2) Alaska Native, (3) Black, non Hispanic, (4) Hispanic, and (5) Pacific Islander or other ethnic group that is underrepresented in science and engineering exceeds 50 percent of total undergraduate enrollment.
- Minority-Serving K-12 school districts with documentation of racial/ethnic diversity using school district and/or US Department of Education level data.
- Native Hawaiian Serving Institutions – Accredited IHEs that award associate or bachelor level degrees that have a 10 percent enrollment of Native Hawaiian undergraduate students.
- Tribal Colleges and Universities – Accredited IHEs that are formally controlled, or have been formally sanctioned or chartered by the governing body of a federally recognized American Indian tribe or tribes. Specifically, TCUs are those institutions cited in section 532 of the Equity in Educational Land-Grant Status Act of 1994 (7 U.S.C. 301 note), any other institution that qualifies for funding under the Tribally Controlled Community College Assistance Act of 1978 (25 U.S.C. 1801 et seq.), and Dine' College, authorized in the Navajo Community College Assistance Act of 1978, Public Law 95-471, title II (25 U.S.C. 640a note).
- Two-Year Colleges – Accredited IHEs whose highest degree awarded is an associate's degree.
- Other IHEs or K-12 school districts with majority underserved populations, with documentation of underserved status provided by the PI and justified using quantitative data.

Outreach and Communication: Diffusion of Research-Based Innovation proposals should contain information about how the process and outcomes of the work will be communicated to others. This may be through the popular press, professional meeting presentations, workshops, or publication in professional society newsletters, among other outlets.

Project Evaluation: All GSE projects should explore the use of benchmarks, indicators, logic models, roadmaps or other evaluative methods to document progress toward goals, objectives and outcomes defined in the proposal. All projects should include some consultation with an external evaluator about the kinds of data and data analysis appropriate for assessing the intellectual merit and broader impacts of the project. All projects are expected to track and report in detail their accomplishment of proposed targets for broader impacts and intellectual merit. The budget should include resources for evaluation and assessment.

Process, impact and outcome measures should be defined by the project and should rely on an appropriate mix of qualitative and quantitative measures. Project evaluation should focus on the strategic impacts of project activities. Strategic impacts are lasting outcomes attributable to the project. Anticipated strategic impacts should be specific, realistic, measurable, and achievable through the project's research, educational activities and products.

Examples of such impacts include:

- Gains in knowledge or acquisition of new skills (e.g., target or treatment group has increased comprehension of specific concepts);
- Changes in behavior (e.g., adoption of new institutional policies and practices related to gender and diversity);
- Changes in attitude or affect (e.g., survey results indicating greater interest in gender equitable teaching practices);
- Development and testing of new information products to further advance training and communication in gender equitable practices.

Evaluation plans should be appropriate for the scope of the project. Only when appropriate and affordable, projects are encouraged to use experimental and quasi-experimental designs that may include control, treatment or comparison groups. The use of external evaluators is encouraged, however internal evaluators may also be used where necessary. All evaluations should be conducted by an evaluator with some independence from the project. Proposals should include a plan to communicate information about the project, including aspects that are found to be effective and ineffective.

The following references may be helpful in designing an evaluation plan:

- The 2002 User-Friendly Handbook for Project Evaluation (NSF 02-057) (<http://www.nsf.gov/pubs/2002/nsf02057/start.htm>).
- FOOTPRINTS: Strategies for Non-Traditional Program Evaluation (NSF 94-51) (<http://nsf.gov/pubs/1995/nsf9541/index.jsp>).
- Online Evaluation Resource Library (<http://oerl.sri.com>).
- Field-tested Learning Assessment Guide (FLAG) (<http://www.wcer.wisc.edu/nise/CL1/flag>).
- Evaluation Handbook, W.K. Kellogg Foundation (<http://www.wkkf.org/Pubs/Tools/Evaluation/Pub770.pdf>).

E. DESCRIPTION - EXTENSION SERVICES PROPOSALS

Extension Services projects will develop a cadre of extension service agents through the offering of proactive training, consulting, implementation assistance, and reporting on experience in the field. They will be a conduit for understanding research findings and for adoption of research-based approaches that will increase participation of women and girls in STEM. Extension services should use a train-the-trainer model and incorporate a unified program of change.

The major participants in an extension service project include:

- Expert Project Team – representatives of the organization(s) that are the implementers of the project. The team develops the unified program of change and trains a cadre of Extension Service Agents.
- Extension Service Agents – practitioners chosen by the Expert Project Team to be trained and then to train others in the practices identified in the unified program of change.
- Practitioner Community – practitioners who receive training and information from the Extension Service Agents in the practices identified in the unified program of change. The target community may be a mix of teachers, counselors, parents, community leaders, administrators, faculty, and others.
- Research Community – researchers who inform the Expert Project Team and the Extension Service Agents of research- and evidence-based practices and learn from the implementation of the project.

Successful extension service proposals will identify all of the major players and describe their roles in the project. Most important is the development of feedback loops among the different actors that inform the formative and summative evaluation of the project and lead to further research and intervention development.

The Expert Project Team organizing the extension services will integrate various research findings into a unified program that will effect change. The Expert Project Team will then communicate research findings in clear language to a group of educators or other practitioners within a specified region or within a specific community of practice. These Extension Service Agents will then communicate and provide training to a wider circle of practitioners in the field. The word "Center" is intentionally not used. The project must meet the business standards of effective customer services: that is, it must be proactive, responsive, timely, customized for educators in the region or community, of high quality, and informed by feedback. (See Wilson & Daviss, 1994, pp. 17-20)

- "Proactive" means that there is an explicit, communicated, ambitious plan for leading change. The plan should be developed following proven business practices and have some "proof of concept" for the methods and techniques proposed.
- "Responsive" means those providing the services understand educators and methods of effective professional development of educators.
- "Customized" means that the services are in touch with the culture of the regional or practitioner community and take advantage of opportunities and other resources unique to the community.
- The "quality" aspect means that the services will show sophistication and credibility in advancing "a unified program of change." They will utilize the latest peer-reviewed research and draw on the knowledge of researchers who have produced the knowledge base.
- "Informed by feedback" means the services are evaluated and improved continuously.

The Extension Service proposal may include, but is not limited to, some of the following elements:

- Create a coherent and credible "unified program of change" drawing on tested gender-related approaches with a specialized theme—for example, informal educational programs for middle school, or recruitment or retention techniques for undergraduate students, or K-12 teacher professional development—or designing change around specific STEM content such as gender-related knowledge about engineering, information technology, science, or mathematics learning. The unified program of change should be identified before the proposal is submitted and should have some "proof of concept" evidence of effectiveness.
- Initiate training seminars, workshops, online courses, tutorials or other curricula and approaches to introduce the Extension Service Agents to the wealth of research and research-based resources. The project should use a "train-the-trainer" model.
- Promote a regional or common-interest-based learning community of Extension Service Agents and Practitioners with web-based support to change organizational commitment, policy, and action. Tie the learning to actions and action research.
- Visit implementation projects as consulting partners and allies, to assist with parts of the promoted program.

- Communicate with researchers about implementation outcomes and future research directions.

Since the aim of the services is to change educational practices, direct services to students are not in scope. The target community should be described, especially if the design of the services is premised on special needs and interests based on educational level, race, ethnicity, economic status, and disability, in addition to gender. The target community may be comprised of members of educational institutions or departments having common characteristics. The Expert Project Team should be recognized as experts by the target community and evidence of this should be provided.

Outreach and Communication. The Extension Services have a strong mandate to communicate information to a community. In addition, there should be some plans to network with other educational improvement efforts, education researchers and professional associations.

Project Evaluation: All GSE projects should explore the use of benchmarks, indicators, logic models, roadmaps or other evaluative methods to document progress toward goals, objectives and outcomes defined in the proposal. All projects are expected to track and report in detail their accomplishment of proposed targets for broader impacts and intellectual merit. The budget MUST include resources for evaluation and assessment.

Process, impact and outcome measures should be defined by the project and should rely on an appropriate mix of qualitative and quantitative measures. Only when appropriate and affordable, projects are encouraged to use experimental and quasi-experimental designs that may include control, treatment or comparison groups. Project evaluation should focus on the strategic impacts of project activities. Strategic impacts are lasting outcomes attributable to the project. Anticipated strategic impacts should be specific, realistic, measurable, and achievable through the project's research, educational activities and products.

Examples of such impacts include:

- Gains in knowledge or acquisition of new skills (e.g., target or treatment group has increased comprehension of specific concepts);
- Changes in behavior (e.g., adoption of new institutional policies and practices related to gender and diversity);
- Changes in attitude or affect (e.g., survey results indicating greater interest in gender equitable teaching practices);
- Development and testing of new information products to further advance training and communication in gender equitable practices.

Evaluation plans should be appropriate for the scope of the project. The use of external evaluators is strongly advised and all evaluations should be conducted by an evaluator with some independence from the project. Proposals should include a plan to communicate information about the project, including aspects that are found to be effective and ineffective.

The following references may be helpful in designing an evaluation plan:

- The 2002 User-Friendly Handbook for Project Evaluation (NSF 02-057) (<http://www.nsf.gov/pubs/2002/nsf02057/start.htm>).
- FOOTPRINTS: Strategies for Non-Traditional Program Evaluation (NSF 94-51) (<http://nsf.gov/pubs/1995/nsf9541/index.jsp>).
- Online Evaluation Resource Library (<http://oerl.sri.com>).
- Field-tested Learning Assessment Guide (FLAG) (<http://www.wcer.wisc.edu/nise/CL1/flag>).
- Evaluation Handbook, W.K. Kellogg Foundation (<http://www.wkkf.org/Pubs/Tools/Evaluation/Pub770.pdf>).

Summary of Key Characteristics. Extension Services are characteristically different from the other tracks in the following ways:

- The scope of services is clear and specific; there is a "unified program for change" developed from the latest knowledge and including evidence of "proof of concept" effectiveness.
- The services employ a "train-the-trainer" model to develop a cadre of Extension Service Agents that will reach and communicate gender equitable practices to practitioner communities.
- The marketing of promising practices is based on rigorous and explicit criteria for defining a "promising" practice, and awareness and leveraging of related efforts to define and identify "promising" practices.
- The project takes advantage of dozens of products, guides, handbooks, tutorials, videos, and curricula already developed and with some evidence of "proof of concept" effectiveness. These should already be identified—i.e., first year activities should not involve researching promising practices or developing guides or materials.
- The selected models or approaches that are promoted are based on evidence of effectiveness or success (especially for female students) and the evidence is cited.
- The Expert Project Team has credibility for providing the best information available in education and social science research. The target community recognizes the expertise of the service providers.
- The team includes experts (researchers and education practitioners) in gender in STEM on the staff as well as through a network or partnerships. The expert credentials for peer-reviewed research and experience with programs, materials, or approaches are clear and relevant.

- The proposal indicates awareness of the community and/or the region to be reached, its unique characteristics, and special opportunities for cooperation and leverage. The Extension Service is integrated into the geographic- or practitioner-based community to be served. Potential Extension Service Agents are identifiable as a group or subgroup of the target community.
- The Expert Project Team includes expertise in consulting and customer service, and shows awareness of business standards for excellence.
- If there is a specialization or theme to the Extension Services, the rationale and resources are described.
- The scale of potential impact is proportional to the funding level.

F. DESCRIPTION - INNOVATION THROUGH INSTITUTIONAL INTEGRATION (I³)

Creativity, connectivity, integration, and synergy are keys to innovation and to developing human and institutional capacity to full potential. In both research and education, it is the forging of new links between ideas or methodologies that were previously disparate that frequently paves the way for innovation. When institutions optimize the benefits to be derived from the creative integration of intellectual perspectives or related domains of work, they create important opportunities for making progress on some of the most important scientific, technological, and educational challenges of our time. On individual campuses across the nation, for example, significant synergistic potential can be ignited when scholars and educators in related disciplines work together. Similarly, NSF awardees can harness new synergies by working together with other NSF-funded projects on their own campus or in close geographic proximity. When the results of these synergies are both compatible with and beneficial for the institution(s) involved, successful innovation can be created^[i]. Past efforts at integration have shown that opportunities for synergy can be created most successfully when collaborative projects include:

- Clear support from senior administrators;
- A cogent plan of action that includes expectations and staff development;
- Open cross-institutional dialogue that is supported and encouraged;
- A common campus-wide vision and value system that stresses the importance of synergistic efforts;
- The formation of a campus network with a set of individuals who take ownership and provide leadership for the initiative^[ii].

The campus network is an important aspect of successful collaboration at every stage of development and is critical to the sustainability and enhancement of created partnerships as well as the institutionalization of new innovations. This network can (a) foster communication across the campus to encourage the formation and dissemination of new ideas, values, and learning; (b) serve as a source of leadership to promote and carry out integrative activities; and (c) develop and sustain existing connections while continually expanding collaborative efforts^[iii].

Innovation through Institutional Integration (I³) challenges faculty, administrators, and others in institutions to think strategically about the creative integration of NSF-funded awards towards a whole that exceeds the sum of its parts. Although there is particular emphasis in I³ on awards managed by programs in the Directorate for Education and Human Resources (EHR), institutional integration is not limited only to EHR awards but can include other NSF awards with a STEM educational focus. Two or more institutions in geographic proximity might, for example, partner to bridge existing NSF-funded awards on their campuses (e.g., RDE, IGERT, LSAMP, ATE, CREST, REU) to broaden participation in STEM fields and enhance undergraduate research opportunities. Additional connections might be made internationally with faculty or students outside the United States who would add their considerable intellectual and cultural perspectives. As another example, an institution might implement new policies, procedures, or mechanisms that encourage and value synergistic efforts among existing NSF-funded awards (e.g., GK-12, MSP, Noyce, REESE, DRK-12) and with other institutional units to better understand and enhance seamlessness across critical educational junctures, perhaps infusing innovative approaches to cyber-learning.

This effort has the following interrelated goals:

- Increase synergy and collaboration across NSF-funded projects and within/between institutions, towards an educational environment where artificial boundaries are significantly reduced and the student experience is more fully integrated;
- Expand and deepen the impact of NSF-funded projects and enhance their sustainability;
- Provide additional avenues to broaden participation through workforce development, especially for those underrepresented in STEM research and education; attend to seamless transitions across critical educational junctures; and/or provide more effectively for a globally engaged workforce;
- Promote innovative programming, policies, and practices to encourage the integration of STEM research and education; and
- Encourage STEM educational or related research in domains that hold promise for promoting intra- or inter-institutional integration and broader impacts.

Proposals that facilitate either (a) inter-institutional or (b) intra-institutional efforts are encouraged. Proposals may be submitted by (a) a single institution to address intra-institutional goals only or (b) an institution acting on behalf of an institutional partnership to address inter-institutional goals.

Proposals are expected to incorporate a depth and quality of creative, coherent, and strategic actions that extend beyond commonplace approaches to normal institutional operations. Proposals may also be submitted for research on

institutional integration or other closely related themes articulated in the goals above.

I³ is a cross-divisional effort in the Directorate for Education and Human Resources (EHR). For Fiscal Year 2009, proposals are being solicited in nine EHR programs that advance I³ goals: CREST, GSE, HBCU-UP, ITEST, LSAMP, MSP, Noyce, RDE, and TCUP. All proposals submitted to I³ through these programs have a common due date and will be reviewed in competition with one another.

[i] Levine, A. (1980). *Why Innovation Fails*. New York: State University of New York Press. Pg. 160.

[ii] Kezar, A. (2003). Enhancing Innovative Partnerships: Creating a Change Model for Academic and Student Affairs Collaboration. *Innovative Higher Education* 28(2): 137-156.

[iii] Kezar, A. (2005). Redesigning for Collaboration within Higher Education Institutions: An Exploration into the Developmental Process. *Research in Higher Education* 46(7): 831-860.

G. PROGRAM EVALUATION

Measuring the overall effectiveness of the GSE program is increasingly important. The NSF is expected to provide federal policymakers in Congress and at the Office of Management and Budget (OMB) with evidence-based measures of all program impacts and effectiveness in accordance with the Program Effectiveness Rating Tool (PART) and the Academic Competitiveness Council (ACC). For an overview on PART visit Expectmore.gov. The Deficit Reduction Act of 2005 (P.L. 109-171) (the act) established the ACC. The statute charged the ACC to:

- Identify all federal programs with a mathematics or science education focus;
- Identify the effectiveness of those programs;
- Determine areas of overlap or duplication among those programs;
- Identify target populations served by such programs; and
- Recommend processes to efficiently integrate and coordinate those programs.

Individual projects funded through the GSE program are expected to cooperate with third-party program evaluation and respond to inquiries, interviews and other approaches for collecting evaluation data across individual grants. All projects should respond to and provide process and outcome data elements that may be summarized across projects.

H. REVIEWING FOR THE GSE PROGRAM

The GSE program is always looking to expand our reviewer pool. If you are on a GSE proposal submitted this year, then you cannot be a panelist this year. If you did not submit a GSE proposal this year in response to this solicitation, you may volunteer to be a panelist. If you would like to volunteer, notify the program officer or science assistant. Include a URL or a biosketch and a brief description of your research expertise in your e-mail. The program officer will contact you if your area of expertise is relevant and we need panelists in that area. Please send the information to jesse@nsf.gov or tcasseus@nsf.gov.

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J. INFORMATION ABOUT PREVIOUS AWARDS

NSF's web site provides links to abstracts for and other information about awards made by this program under prior names [See the NSF web site](#), or use the [Abstracts of Recent Awards Made Through This Program link at the bottom of the GSE Homepage](#). Historically, the program has been called "Program for Women and Girls" (PWG), "Program for Gender Equity in Science, Mathematics, Engineering, and Technology" (PGE), and "Gender Diversity in STEM Education" (GDSE).

NSF's web site provides the ability to search awards using custom queries:

- Element Code: 1544 (this will give you all GSE-funded abstracts)

To find more specific awards, it is possible to narrow the search by, for example, using:

- Element Code: 1544 and Keyword: mentoring
- Element Code: 1544 and Keyword: "learning community"
- Element Code: 1544 and Keyword: AZ

- Element Code: 1544 and Keyword: "middle school"

Two compendia of profiles of projects funded by the program, with a comprehensive index, are available in print, CD-ROM, and as an online PDF file using one of the publication numbers. See [NSF online document system](#). In addition, *New Tools*, a catalogue of products available for order from program PIs, is also available. All documents are available at www.nsf.gov/newformulas as well.

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III. AWARD INFORMATION

Anticipated funding for new grants in all GSE tracks in FY 2009 is \$5,000,000 pending the availability of funds.

Research proposals may request up to a total of \$500,000 for up to three years, pending availability of funds. The proposal should include a budget for each year and a summary budget if there are multiple years.

Diffusion of Research-Based Innovation budgets may request up to \$250,000 for up to three years pending availability of funds. Projects may ask for up to \$100,000 more (for a total of \$350,000) if they include a Broadening Participation Partnership as described in the Full Program Description. Please see Section II.D. for more information about Broadening Participation Partnerships.

Extension Services proposals may request up to a total of \$2.5 million for an average of \$500,000 each year for five years, pending availability of funds. Continued funding in years four and five are contingent on satisfactory performance and availability of funds. Continued funding may be reduced or eliminated if performance is not satisfactory.

GSE expects to fund 7-10 Research proposals, 7-10 Diffusion of Research-Based Innovation proposals, and 1-2 Extension Services proposals, depending on the quality of the submissions and availability of funds.

The proposed start dates should be at least seven months from the full proposal deadline.

Funds should be budgeted for the principal investigator to attend a two-day grantees' meeting in the Washington, D.C. area, each award year (June/August time frame).

A limited equipment request (<10% of total budget) may be allowed for projects intensive in educational technology. Funds for office equipment for project staff is not allowed.

Research proposals and Research projects are eligible for REU (Research Experiences for Undergraduates) supplements, which expressly support the participation of undergraduate students on the project research team, if funds are available. Please see the REU solicitation for complete parameters and the method for making a request for an REU supplement (see <http://www.nsf.gov/home/crssprgm/reu/start.htm>). Proposers should consult the Program Director in advance of a request for REU supplements.

Awards for Innovation through Institutional Integration (I3) projects will be made for durations of up to five years, with years four and five dependent on performance, in amounts of up to \$ 250,000 per year, for a total of up to \$ 1.25 million over 5 years. I3 awards will be made as continuing grants.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- No limits specified for GSE proposals

Eligibility for Innovation through Institutional Integration (I³) is limited to institutions of higher education (including two- and four-year colleges) accredited in, and having a campus located in the US. If the proposal is exclusively for I³ STEM educational or related research, then all categories of proposers identified in the NSF Grant Proposal Guide are eligible to submit.

PI Limit:

None specified for GSE.

The Principal Investigator for an Innovation through Institutional Integration (I³) proposal must be the university provost or equivalent chief academic officer or president, unless the proposal is exclusively for I³ STEM educational or related research.

Limit on Number of Proposals per Organization:

No limit for GSE.

For Fiscal Year 2009, proposals are being solicited in nine EHR programs that advance the goals of Innovation through Institutional Integration (I³): CREST, GSE, HBCU-UP, ITEST, LSAMP, MSP, Noyce, RDE, and TCUP. Given the focus on institutional integration, an institution may submit only one proposal to the I³ competition for each deadline.

Limit on Number of Proposals per PI:

None Specified

Additional Eligibility Info:

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent(required):

A letter of intent is required for Research and Extension Services proposals prior to the submission of a full proposal. Letters of intent must be submitted via the NSF FastLane system, using the Letter of Intent module. The intended proposal type (research or extension service) must be specified in the first sentence of the Letter of Intent. Letters will be reviewed by NSF staff for purposes of assembling the most appropriate review panel(s) for the full proposals. No feedback will be provided to submitters unless a Letter suggests an inappropriate project for GSE funding. No Letter of Intent is required for Diffusion of Research-Based Innovation proposals. Submission of multiple Letters of Intent is not allowed.

The **LETTER OF INTENT** is limited to one page and should include basic information about:

- Identify proposal type and name the proposed activity;
- For research proposals: briefly identify the theory, research questions and hypotheses, target research subjects, and data gathering and analysis techniques;
- For extension service proposals: briefly identify the scope of the service, project participants (expert project team, extension service agents, target practitioner community), and the unified program of change elements;
- State the organizations involved;

Letter of Intent Preparation Instructions:

When submitting a Letter of Intent through FastLane in response to this Program Solicitation please note the conditions outlined below:

- Sponsored Projects Office (SPO) Submission is required when submitting Letters of Intent

- Submission of multiple Letters of Intent is not allowed

Full Proposal Preparation Instructions: Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program 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. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (<http://www.nsf.gov/pubs/policydocs/grantsgovguide607.pdf>). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

Collaborative Proposals. All collaborative proposals submitted as separate submissions from multiple organizations must be submitted via the NSF FastLane system. Chapter II, Section D.3 of the Grant Proposal Guide provides additional information on collaborative proposals.

On the **COVER SHEET** select the program name "Research on Gender in Science and Engineering" in the Education and Human Resources Directorate, Human Resource Development.

The **TITLE** should be prefaced with an abbreviation identifying the GSE goal supported by the proposal:

- GSE/RES - for Research proposals
- GSE/DIF - for Diffusion of Research-Based Innovation proposals
- GSE/EXT - for Extension Service proposals

The **PROJECT SUMMARY** should:

- Name and describe the proposed activity;
- For research proposals: briefly identify the theory, research question(s) and hypotheses, target research subjects, and data analysis techniques;
- For extension service proposals: briefly identify the scope of the service, project participants (expert project team, extension service agents, target practitioner community), and the unified program of change elements;
- For diffusion of research-based innovation proposals: briefly identify the scope of the effort, the research-based innovation being diffused, and the target audience;
- State the organizations involved;
- Especially highlight the contribution to knowledge, social, and/or human capital;
- **Address each NSF review criterion under separate headings: INTELLECTUAL MERIT and BROADER IMPACTS**

The **Research PROJECT DESCRIPTION** should address:

- What is the theoretical basis for the research?
- What are the major research questions?
- What are the hypotheses to be tested?
- Who is the study population and what is the plan to reach that population? What sample size is needed and how is that determined?
- What kinds of data will be gathered and how? What methods will be used to analyze the data and why are these best for this project?
- How is the study connected to related work in the field? Reference prior related work and explain the value added and the national benefit of the proposed work.

- Identify key team members, consultants, and advisors. Relate their qualifications and skills to specific components of the proposed work.
- Outline a project timeline and management plan.
- Describe plans for broad outreach and communication of findings.
- Describe and evaluation plan. How will the project be assessed and evaluated in terms of goals, objectives and outcomes of the project (including both broader impacts and intellectual merit)? What data will be gathered to evaluate goals, objectives and outcomes?
- For prior grantees, include a discussion of the results of prior work (**required**).

Common weaknesses in research proposals (according to Dietz, et al, 2002) are:

1. Poor formulation of research questions
2. Poor articulation of research design, theory, hypotheses or methods
3. Failure to recognize multiple studies have been conceived as a single study
4. Failure to situate the study or its potential findings within prior work and literature
5. Failure to situate the study or its potential findings within a framework or theory
6. Weak links between research goals and proposed methodology

The **Diffusion of Research-Based Innovation PROJECT DESCRIPTION** should address:

- What research-based innovation(s) will be diffused?
- What is the goal of the diffusion effort, and what is the justification for it?
- What audience will be reached, how, and what is the desired impact on the audience?
- What is the context of the diffusion effort; what other projects, events, or products exist and how does this project contribute national benefits?
- Describe the management plan and timeline.
- Describe the qualifications of key team members and suitability for their role in the project.
- Provide a list of advisory committee members and description of their level of involvement, if an advisory committee is proposed.
- Describe plans for broad outreach and communication of findings and/or activities.
- Describe and evaluation plan. How will the project be assessed and evaluated in terms of goals, objectives and outcomes of the project (including both broader impacts and intellectual merit)? What data will be gathered to evaluate goals, objectives and outcomes?
- If a Broadening Participation Partnership is proposed, a description of the collaborative effort should be included that outlines the activities of all the partners. The PIs must also provide documentation (including statistics and/or legal status) of partnering organizations' status as serving underrepresented populations in STEM (please see section II. D. for information about the Broadening Participation Partnership).
- For prior grantees, a discussion of the results of prior work (**required**).

The **Extension Services PROJECT DESCRIPTION** should address:

- What is the scope of the service, in terms of geography, community, and/or intellectual specialization? What is the rationale for this scope? (Why this scope? What are the advantages, benefits, strengths?)
- Describe a unified program of change to be extended. How have promising practices, products, or curricula been chosen as part of the program? What is the evidence ("proof of concept") for the effectiveness of the selected models or approaches?
- Describe the materials to be used in the extension service efforts. Are the materials already developed and available? If not, will they be before the start of the extension services effort?
- Identify the Expert Project Team and Researchers involved and their roles. What expertise related to the project is possessed by the Expert Project Team members? What is the relationship between the Expert Project Team and the community to be served?
- Identify the target population of Extension Service Agents and Practitioners and describe the methods for extension -- What is the train-the-trainer model to be employed? How will Extension Service Agents and Practitioners be reached? What activities and products are planned for this community?
- Describe the business practices for providing good extension services to the community. Outline a project timeline and management plan.
- What kinds of feedback loops will be created? How will each group involved give and get feedback about how the project is working? Describe how the services will be networked with other educational improvement efforts or professional associations.
- Describe a plan for project evaluation including measures of goals, objectives and outcomes. How will the goals, objectives and outcomes of the project (including both broader impacts and intellectual merit) be measured?
- What is the potential impact of this particular service over 3-5 years?
- Describe plans for broad outreach and communication of findings.
- For prior grantees, a discussion of the results of prior work (**required**).

REFERENCES CITED: All references cited in the Project Summary and Project Description should be listed in this section

BIOSKETCHES: Biosketches for the PI, Co-PI(s) and senior project personnel are required. Biosketches MUST follow the

NSF guidelines outlined in the NSF Grant Proposal Guide or NSF Grants.gov Application Guide and may not be longer than 2 pages.

BUDGET AND BUDGET JUSTIFICATION: Budgets should be in NSF format and include up to three pages of budget justification. The budget justification should be in narrative form and include detailed explanations for each line item with budget resources listed in the budget. Information about what may or may not be included in the budget or budget justification is outlined in the NSF Grant Proposal Guide and NSF Grants.gov Application Guide. If a subaward is indicated in the budget, a subaward budget must also be submitted.

FACILITIES AND EQUIPMENT: A list of current facilities and equipment to be used in the implementation of the project activities should be included in this section. Further information is available in the NSF Grant Proposal Guide or NSF Grants.gov Application Guide.

SUPPLEMENTARY DOCUMENTS: Only those supplementary documents listed in the Grant Proposal Guide or NSF Grants.gov Application Guide are allowed to be appended in the Supplementary Document section. Additional project description, examples of survey or interview protocols, past PI efforts, or other project-related materials are NOT ALLOWED. The inclusion of Letters of Support from participating organizations is strongly encouraged.

INNOVATION THROUGH INSTITUTIONAL INTEGRATION (I³) PROPOSALS

The proposal should articulate the project's vision, goals, and anticipated outcomes and describe how the project will achieve them. The proposal should draw on the existing, relevant base of literature and articulate how the plan of work is so informed. It is expected that implementation of the plan of work will impact participating NSF awards, as well as other relevant parts of the institution(s). The proposal should, therefore, address how the goals of the overall project are compatible with the goals of the individual integrated components, as well as how the project is both compatible with and beneficial for the host institution(s). The proposal should include a management/governance plan that describes who is responsible for what, a timeline, and an evaluation plan. All proposals must clearly demonstrate that the submitting team has the capability to manage the project, organize the work, and meet deadlines.

Each proposed implementation project in Innovation through Institutional Integration (I³) should have an evaluation plan to assess progress and success in meeting project goals and objectives. An independent, external project-level evaluation is to be conducted to inform the institution and others of the progress and findings of the grant activities, especially those that address the project's synergistic activity (i.e., the value added by I³). I³ projects are expected to have baseline data, establish measurable targets, and collect evidence to determine annual progress and long-term outcomes. If applicable, it is highly desirable to establish a systematic plan to track student participants beyond their involvement in the project. Project-level evaluation should be designed to offer feedback for strengthening implementation over the course of the project, provide credible evidence to justify continued investment in the project, and report results (and describe models/paradigms) of institutional and/or disciplinary changes associated with the investment strategy.

Each I³ project, as part of a national effort, is expected to cooperate in the monitoring and independent portfolio evaluation efforts conducted by NSF's contracted evaluators. While each project will propose its own types of specific qualitative and quantitative measures, some later standardization of performance monitoring is anticipated so that NSF can conduct a summative/impact evaluation. The I³ portfolio (summative/impact) evaluation will be designed to determine how effectively I³ is contributing to the knowledge base, building a community of innovators, strengthening/advancing the higher education STEM infrastructure, and promoting collaborations that advance the goals of I³.

Proposals for research must address one or more I³ goals and discuss the current state of knowledge relevant to the project. This brief literature review should clearly inform the proposed research. The project description should identify the methods the project will use and explain why those methods are appropriate to the questions that the proposal addresses. Methodologies must be matched with strategic research questions, and the logic among research question, method, analysis, inference, and evidence should be well articulated.

The results of prior, relevant NSF investment(s), **especially projects on which the proposed institutional integration is based**, are to be described and supported by data, along with a discussion of both successes and failures. The proposal should also clearly indicate how the intended work differs from, builds on, or is otherwise informed by prior efforts.

B. Budgetary Information

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

Other Budgetary Limitations:

Research budgets may be up to \$500,000 for up to three years.

Diffusion of Research-Based Innovation budgets may be up to \$250,000 for up to three years. Projects may ask for up to \$100,000 more (for a total of \$350,000) if they are partnering with institutions serving underrepresented populations. Please see Section II.D. for more information about Broadening Participation Partnerships.

Extension Services budgets may be up to \$2,500,000 for five years, with years four and five dependent upon performance.

Funds should be budgeted for the principal investigator or a project member to attend a two-day grantees' meeting in the Washington, D.C. area, each award year, in March/April.

A limited equipment request (<10% of total budget) may be allowed for projects intensive in educational technology. Office equipment for project staff are expected to come from other sources. (See Section III)

Awards for Innovation through Institutional Integration projects will be made for durations of up to five years, with years four and five dependent on performance, in amounts of up to \$ 250,000 per year, for a total of up to \$ 1.25 million over 5 years. Innovation through Institutional Integration awards will be made as continuing grants.

C. Due Dates

- **Letter of Intent Due Date(s) (required)** (due by 5 p.m. proposer's local time):

February 02, 2009

Research Proposals - Required Letter of Intent

February 09, 2009

Extension Services Proposals - Required Letter of Intent

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

February 24, 2009

Innovation through Institutional Integration (I3)

March 30, 2009

Research Proposals

April 06, 2009

Extension Services Proposals

April 06, 2009

Diffusion of Research-Based Innovation Proposals

August 25, 2009

Innovation through Institutional Integration (I3)

D. FastLane/Grants.gov Requirements

- **For Proposals Submitted Via FastLane:**

Detailed technical instructions regarding the technical aspects of 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 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>.

For Proposals Submitted Via Grants.gov:

Before using Grants.gov for the first time, each organization must register to create an institutional profile. Once registered, the applicant's organization can then apply for any federal grant on the Grants.gov website. The Grants.gov's Grant Community User Guide is a comprehensive reference document that provides technical information about Grants.gov. Proposers can download the User Guide as a Microsoft Word document or as a PDF document. The Grants.gov User Guide is available at: <http://www.grants.gov/CustomerSupport>. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

Submitting the Proposal: Once all documents have been completed, the Authorized Organizational Representative (AOR) must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The AOR must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

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>.

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.

Additional Review Criteria:

In addition to the two NSF criteria for Intellectual Merit and Broader Impacts, special review criteria for Innovation through Institutional Integration (I³) implementation projects are:

- The extent to which the proposed project addresses the interrelated goals for institutional integration and adds value to existing NSF awards.
- The extent to which there is a demonstrated track record of success for the existing NSF awards on which the proposed institutional integration is based.
- The degree of innovation in the proposed project as evidenced by a depth and quality of creative, coherent, and strategic actions that extend beyond commonplace approaches to normal institutional operations.
- The extent to which the proposed project addresses programming, policies, and practices commensurate with the sustained institutional change needed to seed and nurture appropriate, synergistic relationships among discrete NSF awards.

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by 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 pubs@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.

Special Award Conditions:

Extension Services awards will be made for up to five years. Funding for years four and five is contingent on performance and availability of funds, as evaluated from annual reports and site visit reports. If performance is not satisfactory, then continued funding will be reduced.

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:

- Jolene Jesse, Program Director, 815 N, telephone: (703) 292-7303, fax: (703) 292-9018, email: jjesse@nsf.gov
- Tayana Casseus, Science Assistant, NSF, 815N, telephone: (703) 292-4684, email: tcasseus@nsf.gov

For questions related to the use of FastLane, contact:

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

- Toni Edquist, Program Specialist, 815 N, telephone: (703) 292-4649, email: tedquist@nsf.gov
- Victoria A Smoot, Financial Operation Specialist, 815 N, telephone: (703) 292-4677, fax: (703) 292-9018, email: vs moot@nsf.gov

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.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, MyNSF (formerly the Custom News Service) is an information-delivery system 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 or the user's Web browser each time new publications are issued that match their identified interests. MyNSF also is available on NSF's Website at <http://www.nsf.gov/mynsf/>.

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>.

The program does not currently fund intervention or education projects that directly serve students as their primary purpose. Those wishing to undertake direct intervention or education service projects are encouraged to search the NSF web site and other publications for appropriate funding programs. Some potential programs to consult include the following, although there may also be other programs not on this list:

- Discovery Research K-12 (DR-K12) - http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=500047&org=DRL&from=home;
- Advanced Learning Technologies (ALT) - http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12834&org=DRL&from=home;
- Advanced Technological Education (ATE) - http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5464&org=DRL&from=home;
- Informal Science Education (ISE) - http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5361&org=DRL&from=home;
- Information Technology Experiences for Students and Teachers (ITEST) - http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5467&org=DRL&from=home;
- Research and Evaluation on Education in Science and Engineering (REESE) - http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13667&org=DRL&from=home;
- Course, Curriculum and Laboratory Improvement (CCLI) - http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5741&org=DUE&from=home;
- Science, Technology, Engineering and Mathematics Talent Expansion Program (STEP) - http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5488&org=DUE&from=home;
- Broadening Participation in Computing (BPC) - http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13510&org=CNS;
- Engineering Education Programs (EEP) - http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13374&org=EEC;
- Research Experiences for Undergraduates (REU) - http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5517&from=fund.

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: 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; and 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 proposer 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 or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; 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," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). 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 Office of Management and Budget (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 the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

Suzanne H. Plimpton
Reports Clearance Officer
Division of Administrative Services
National Science Foundation
Arlington, VA 22230

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