

Research on Gender in Science and Engineering FY2008 (GSE)

Program Solicitation

NSF 07-578

Replaces Document(s):

NSF 07-501



National Science Foundation

Directorate for Education & Human Resources
Division of Human Resource Development

Preliminary Proposal Due Date(s) (required):

November 05, 2007

Research Proposals - Preliminary

January 07, 2008

Extension Services Proposals - Preliminary

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

February 25, 2008

Research Proposals

April 07, 2008

Extension Services Proposals

April 07, 2008

Diffusion of Research-Based Innovation Proposals

REVISION NOTES

In furtherance of the President's Management Agenda, NSF has identified programs that will offer proposers the option to utilize Grants.gov to prepare and submit proposals, or will require that proposers utilize Grants.gov to prepare and submit proposals. Grants.gov provides a single Government-wide portal for finding and applying for Federal grants online.

In response to this program solicitation, proposers may opt to submit proposals via Grants.gov or via the [NSF FastLane](#) system. 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.

Outreach and Communication proposals have been renamed Diffusion of Research-Based Innovation proposals to better reflect the intent of the proposal competition. The budget limit for this competition is now \$250,000 for three years.

In addition, Diffusion of Research-Based Innovation proposals may include a Broadening Participation Partnership with eligible institutions. Those proposals that include such partnerships may request \$350,000 for three years. Please see section II.D. for more information about Broadening Participation Partnerships, including a list of eligible institutions.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Research on Gender in Science and Engineering FY 2008 (GSE)

Synopsis of Program:

The program seeks to broaden the participation of girls and women in all fields of science, technology, engineering, and mathematics (STEM) education by supporting 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 does not currently fund intervention or education projects that directly serve students as their primary purpose. Research projects may 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.

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 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.

Anticipated Funding Amount: \$5,000,000 for new grants in all tracks, pending availability of funds.

Eligibility Information

Organization Limit:

None Specified

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI:

None Specified

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable
- **Preliminary Proposals:** Submission of Preliminary Proposals is required. Please see the full text of this solicitation for further information.
- **Full Proposals:**
 - Full Proposals submitted via FastLane: 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/bfa/dias/policy/docs/grantsgovguide.pdf/>)

B. Budgetary Information

- **Cost Sharing Requirements:** Cost Sharing is not required by NSF.
- **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

- **Preliminary Proposal Due Date(s) (required):**

November 05, 2007

Research Proposals - Preliminary

January 07, 2008

Extension Services Proposals - Preliminary

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

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Diffusion of Research-Based Innovation Proposals

Proposal Review Information Criteria

Merit Review Criteria: National Science Board approved criteria apply.

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 at programs that strengthen scientific and engineering (S&E) research potential and education programs 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 factors behind the underrepresentation of girls and women in STEM education; societal, formal and informal educational systems' interaction with individuals that encourage or discourage interest and persistence in study or careers in certain STEM fields.
- **Diffusion of Research-Based Innovation projects:** provide a mechanism for informing a wider audience (e.g., teachers, faculty, guidance counselors, parents, etc.) about issues, research findings, and strategies for changing educational practice.
- **Extension Services:** provide training and consulting services to educators and institutions, to 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."

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 & Cambell, 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, girls are less likely to report liking math or science. In some fields, such as computer science, boys accounted for 86 percent of those taking the Advanced Placement exam in 2002, and received higher average scores than their female counterparts. (Freeman 2004)
- 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).
- 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 advance the participation of women and girls in STEM fields where they continue to be underrepresented, in accord with NSF's goal of developing a diverse science and engineering workforce. 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 and

others who have a significant influence on the career plans of women and girls.

- To catalyze new thinking and future action among educational institutions and/or other organizations by convening 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 within a certain geographic region or within a community of practice, explaining 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 from kindergarten through the undergraduate level, in those fields where they are underrepresented;
- To show educators 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 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. 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 and conceptual framework for the study. They should include a discussion of the theory or theories grounding the research and outline 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 math skills, different retention patterns, different preferences among computer interface features, interests in social interaction while learning, and interests in the social relevance and application of science experiments.
- Explore whether social and psychological behavior patterns of males or females 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.

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.

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.

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 a multidisciplinary meeting to consolidate knowledge about educational practice related to male or female students in K-16 STEM at a certain educational level. A workshop on recruitment and retention in undergraduate engineering departments, or a symposium on strategies for strengthening recruitment of students into computer science are examples. Such a meeting 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' or boys' education in STEM and factors contributing to interest, performance, or choice of careers.
- Significantly enhance distribution of an educational product (e.g., book, curriculum guide, seminar manual, web site) 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 information about gender equitable practices or issues.

Broadening Participation Partnerships: 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 be documented with, at a minimum, strong letters of support from the partnering institutions in the supplementary documents section. Ideally, one or more Co-PIs from the partnering institution would be included. The partnering institution should receive 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. In addition, there is a subset of IHEs that repeatedly produce doctoral degree recipients in STEM who have disabilities; SRS data, *Women, Minorities and Persons with Disabilities in Science and Engineering*, identifies these institutions.
- Minority Serving Institutions Accredited IHEs that award associate or bachelor level degrees that have an aggregate undergraduate enrollment of Hispanics, Blacks, American Indians, and Alaska Natives exceeding 50 percent of total 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.

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 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 95-41) (<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>).

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.

E. DESCRIPTION - EXTENSION SERVICES PROPOSALS

Extension Services will offer 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 in STEM. Extension services should use a train-the-trainer model and have incorporated a unified program of change.

The Services will integrate various research findings into a unified program that will affect change. The Services personnel will communicate research findings in clear language to educators within a specified region or within a specific community of practice. The word Center is intentionally not used, so as to indicate that 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, for example, involving the customer.
- 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.

Suggested elements of Extension Service projects may include but are not limited to:

- 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 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.
- Initiate training seminars, workshops, online courses, tutorials or other curricula and approaches to introduce the target population 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 with web-based support to change organizational commitment, policy, and action. Tie the learning to actions and action research.
- Collect, digest, and provide information about the range of resources now available on gender in STEM.
- Visit implementation projects as consulting partners and allies, to assist with parts of the promoted program.

The target community may be a mix of teachers, counselors, parents, community leaders, administrators, faculty, and others. Since the aim of the services is to change educational systems, 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 extension service providers should be recognized as experts by the target community and evidence of this should be provided.

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 disseminate 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>).
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- 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>).

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.

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. The services employ a "train-the-trainer" model for the outreach and communication of gender equitable practices.
- 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 program takes advantage of dozens of products, guides, handbooks, tutorials, videos, and curricula already developed. 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 services personnel have 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 (research producers 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.
- The 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. 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.

G. 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. 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 jjesse@nsf.gov.

H. REFERENCES

Bordonaro, M., Borg, A., Campbell, G., Clewell, B., Duncan, M., Johnson, J. Johnson, K., Matthews, R., May, G., Mendoza, E., Sideman, J., Winters, S., & Vela, C. (2000). *Land of Plenty: Diversity as America's Competitive Edge in Science, Engineering, and Technology*. Washington, D.C.: The Congressional Commission on the Advancement of Women and Minorities in Science, Engineering, and Technology Development, Opportunities in Science and Engineering, 2000.

Ceci, S. J. & Williams, W.M. (Eds.). (2007). *Why Aren't More Women in Science? Top Researchers Debate the Evidence*. Washington, DC: American Psychological Association.

Clewell, B.C. & Campbell, P.B. (2002). Taking stock: Where we've been, where we are, where we're going. *Journal of Women and Minorities in Science and Engineering* 8:255-284.

Dietz, J. S., Anderson, B., & Katzenmeyer, C. (2002). Women and the Crossroads of Science: Thoughts on Policy, Research, and Evaluation. *Journal of Women and Minorities in Science and Engineering*, 8(3&4), 395-408.

Etzkowitz, H., Kemelgor, C., & Uzzi, B. (2000). *Athena Unbound: The Advancement of Women in Science and Technology*. New York, NY: Cambridge University.

Freeman, C. E. (2004). *Trends in Educational Equity of Girls and Women*. Washington, DC: National Center for Educational Statistics (NCES 2005-016).

Jacobs, J.E., Davis-Kean, P., Bleeker, M., Eccles, J., Malanchuk, O. (2005). "I can, but I don't want to": The impact of parents, interests and activities on gender differences in math. In Ann Gallagher and James Kaufman, eds. *Gender Differences in Mathematics*, New York, NY: Cambridge University Press.

Margolis, J., and Fisher, A. (2002). *Unlocking the Clubhouse: Women in Computing*. Cambridge, MA: MIT Press.

National Academy of Sciences. (2005). *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Future*. Washington, DC: National Academy Press.

National Research Council. (2002). *Scientific research in education*. Committee on Scientific Principles for Education Research. Shavelson, R.J., and Towne, L., Editors. Center for Education. Division of Behavioral and Social Sciences and Education. Washington, DC: National Academy Press.

National Science Board. (2003). *The Science and Engineering Workforce: Realizing America's Potential*. Arlington, VA: (NSF 03-69)

National Science Foundation. (2003). *New Formulas for America's Workforce: girls in science and engineering*. Arlington, VA, 2003 (NSF 03-207 printed book, NSF 03-208 brochure+CD).

National Science Foundation. (2004). *Women, Minorities and People with Disabilities in Science and Engineering*. Arlington, VA (NSF 04-317).

Preston, A. E. (2004). *Leaving Science: Occupational exit from scientific careers*. New York, NY: Russell Sage Foundation.

Steinke, J. (1997). A portrait of a woman as a scientist: Breaking down barriers created by gender-role stereotypes. *Public Understanding of Science* 6:409-428.

Tiedemann, J. (2002). Teachers' gender stereotypes as determinants of teacher perceptions in elementary school mathematics. *Educational Studies in Mathematics* 50:49-62.

Valian, V. (1998) *Why so slow?: The advancement of women*. Cambridge, MA: MIT Press.

Wilson, K. G. & Daviss, B. (1994). *Redesigning Education*. New York: Henry Holt and Company.

I. INFORMATION ABOUT PREVIOUS AWARDS

HRD's web site provides links to abstracts for and other information about awards made by this program under prior names [See the HRD web site](#). 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

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.

National Science Foundation (2003). *New Formulas for America's Workforce: Girls in Science and Engineering*. Arlington, VA, 2003 (NSF 03-207 printed book, NSF 03-208 brochure+CD).

National Science Foundation (2006). *New Formulas for Americas Workforce 2: Girls in Science and Engineering*. Arlington, VA, 2006 (NSF 06-60 printed book, NSF 07-9 brochure+CD).

National Science Foundation (2006). *New Tools for Americas Workforce*. Arlington, VA, 2006 (NSF 06-59 printed book, NSF 07-9 brochure+CD).

III. AWARD INFORMATION

Anticipated funding for new grants in all tracks in FY 2008 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. (Awards may be fully funded in the first year.)

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 are partnering with institutions serving underrepresented populations. 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 will be reduced or eliminated if performance is not satisfactory.

NSF 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 (March/April time frame).

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.

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.

IV. ELIGIBILITY INFORMATION

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

Organization Limit:

None Specified

PI Limit:

None Specified

Limit on Number of Proposals per Organization:

None Specified

Limit on Number of Proposals per PI:

None Specified

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Preliminary Proposals*(required)*:

A preliminary proposal is required for Research and Extension Services proposals prior to the submission of a full proposal. It will be reviewed by NSF staff and/or external reviewers to provide input for developing a full proposal. A full proposal will be Encouraged or Discouraged based on the review of the preliminary. No preliminary proposal is required for Diffusion of Research-Based Innovation proposals.

The preliminary proposal must be submitted via Fastlane. See Section V.D. below. The Grants.gov option only applies to Full Proposals submitted under this solicitation

Cover Sheet: Be sure to check the PRELIMINARY PROPOSAL box. Select the program name "Research on Gender in Science and Engineering" in the Education and Human Resources Directorate, Human Resource Development.

The **PROJECT SUMMARY** should:

- Name and describe the proposed activity (what and how),
- Describe the research question(s) or audience or service impact,
- Describe the target research subjects or audience (who) or community,
- State the organizations involved (who),
- Especially highlight the contribution to knowledge, social, or human capital (why),
- **Address each NSF review criterion under separate headings: INTELLECTUAL MERIT and BROADER IMPACTS**

PROJECT DESCRIPTION: The narrative is limited to 5 pages. It should sketch, in broad terms, the essential features of the project:

RESEARCH

1. What is the research question? What is the theoretical basis for the research?
2. What findings are expected?
3. What is the contribution to the knowledge base? Reference prior related work and explain the value added and the national benefit of the work.
4. What is the study population and the plan to reach the population?

5. Describe the conceptual or disciplinary framework and methods to be used.
6. Identify key team members, consultants, and advisors. Relate their qualifications and skills to specific components of the proposed work in one or two sentences.
7. Describe plans for broad outreach and communication of findings.

EXTENSION SERVICES

1. What is the scope of the service, in terms of geography or community and intellectual specialization?
2. Briefly describe a unified program of change to be extended. How will promising practices, products, or curriculum be chosen as part of the program? What is the evidence for effectiveness of the selected models or approaches?
3. What is the relationship between the extension service and the community to be served?
4. What expertise, related to the project, is possessed by the extension team members?
5. Describe the methods for extension --What is the train-the-trainer model to be employed? How will the service reach practitioners in education? What activities and products are planned for this community?
6. What is the potential impact given this scope?

REFERENCE LIST: A list of references cited in the preliminary proposal is expected and should be included in the section on FastLane labeled "References Cited."

BIOGRAPHICAL SKETCH: A biographical sketch of the PI and co-PI(s) is required. Biosketches must follow the guidelines in the NSF Grant Proposal Guide (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg) and may not exceed 2 pages.

BUDGET: No budget pages are required; a requested total amount on the cover sheet is sufficient.

Supplemental materials or appendices are NOT permitted for preliminary proposals.

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/bfa/dias/policy/docs/grantsgovguide.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 services proposals

The **PROJECT SUMMARY** should:

- Name and describe the proposed activity (what and how),
- Describe the research question (or hypothesis) or audience impact or service impact,
- Describe the target research subjects, audience, or community (who),
- State the organizations involved (who),
- Especially highlight the contribution to knowledge, social, or human capital (why),
- **Address each NSF review criterion under separate headings: INTELLECTUAL MERIT and BROADER IMPACTS**

The **Research PROJECT DESCRIPTION** should address:

- What is the research question? What is the theoretical basis for the research?
- What is the study population and the plan to reach the population?
- What hypotheses will be tested? What findings are expected?
- What is the contribution to the knowledge base? Reference prior related work and explain the value added and the national benefit of the work.
- What methods will be used and why are these best for this project?
- 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.
- How will the goals, objectives and outcomes of the project (including both broader impacts and intellectual merit) be measured?
- For prior grantees, a discussion of the results of prior work.

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 will be synthesized for diffusion?
- What is the goal of the diffusion effort, and what is the justification for it?
- What audience will it reach 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.
- A list of advisory committee members and description of their level of involvement, if an advisory committee is proposed.
- Describe a plan for project evaluation including measures of goals, objectives and outcomes.
- For prior grantees, a discussion of the results of prior work.
- If a Broadening Participation Partnership is included, a description of the collaborative effort should be included along with documentation of partnering organizations' status as serving underrepresented populations in STEM (please see section II.D. for information about the Broadening Participation Partnership).

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

- What is the scope of the service, in terms of geography, community, and intellectual specialization?
- What is the rationale for this scope? (Why this scope? What are advantages, benefits, strengths?)
- Describe a unified program of change to be extended. How will promising practices, products, or curricula be chosen as part of the program? What is the evidence 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?
- What is the relationship between the extension service and the community to be served?
- What expertise is on the extension team? How are they suited to the proposed scope of the service and what are their roles?
- Describe the methods for extension --What is the train-the-trainer model to be employed? How will the service reach practitioners in education? What activities and products are planned for this community?
- Describe the business practices for providing good extension services to the community.
- What is the potential impact of this particular service over 3-5 years?
- 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.

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

BIOSKETCHES: Biosketches for the PI and Co-PI(s) 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 include detailed explanation of 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.

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**.

B. Budgetary Information

Cost Sharing: Cost sharing is not required by NSF in proposals submitted to the National Science Foundation.

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.

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)

C. Due Dates

- **Preliminary Proposal Due Date(s) (required):**

November 05, 2007

Research Proposals - Preliminary

January 07, 2008

Extension Services Proposals - Preliminary

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

February 25, 2008

Research Proposals

April 07, 2008

Extension Services Proposals

April 07, 2008

Diffusion of Research-Based Innovation Proposals

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 and, if they meet NSF proposal preparation requirements, for review. 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 with the proposer.

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 and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?

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

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

Integration of Research and Education

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

Integrating Diversity into NSF Programs, Projects, and Activities

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

B. Review 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 date of receipt. 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 Federal Demonstration Partnership (FDP) Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the award letter. Cooperative 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/general_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 Assistant, 815 N, telephone: (703) 292-4649, email: tedquist@nsf.gov
- Victoria A. Smoot, Program Specialist, 815 N, telephone: (703) 292-4677, fax: (703) 292-9018, email: vsmoot@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;](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.

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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.

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