

Program for Gender Equity in Science, Mathematics, Engineering and Technology (FY 2002) (PGE)

Program Announcement

NSF 01-130

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES
DIVISION OF HUMAN RESOURCE DEVELOPMENT

LETTER OF INTENT DUE DATE(S) (*optional*): December 19, 2001, February 19, 2002

FULL PROPOSAL DEADLINE(S) :

| | |
|-------------------------|--|
| January 29, 2002 | Elementary and Middle School, Informal Education (K-12). Optional letter/email of intent due December 19, 2001. |
| March 29, 2002 | High School, Undergraduate, Teacher and Faculty Development, and Educational Technologies. Optional letter/email of intent due February 19, 2002. |



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SUMMARY OF PROGRAM REQUIREMENTS

GENERAL INFORMATION

Program Title: Program for Gender Equity in Science, Mathematics, Engineering and Technology (FY 2002) (PGE)

Synopsis of Program: The program seeks to broaden the participation of girls and young women in all fields of science, mathematics, engineering and technology (SMET) education by supporting research, demonstration, and dissemination projects that will lead to change in education policy and practice. Typical projects will investigate gender-related differences in learning; gender-related differences in educational experience, interest, and performance; and pedagogical approaches and teaching styles that are gender-neutral or encouraging to female students. The findings and outcomes of the program will lead to understanding, for example, how to maintain the interest of girls in science past middle school, how to bring more girls into elective high school mathematics and advanced placement science courses, and how to increase enrollments in undergraduate studies in SMET, particularly in physical sciences, engineering and computer sciences. The program offers one to three year grants.

Cognizant Program Officer(s):

- Dr. Margrete S. Klein, Elementary and Middle School, Informal Education (K-12), Program Director, Education and Human Resources, Human Resource Development, Room 815, telephone: 703.292.8637, e-mail: mklein@nsf.gov.
- Dr. Ruta Sevo, High School, Undergraduate, Teacher and Faculty Development, and Educational Technologies, Program Director, Education and Human Resources, Human Resource Development, Room 815, telephone: 703.292.4676, e-mail: rsevo@nsf.gov.

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

- 47.076 --- Education and Human Resources

ELIGIBILITY INFORMATION

- **Organization Limit:** An organization may not, in the same competition, submit as the primary performer on one proposal and as a collaborator on another proposal.
- **PI Eligibility Limit:** None
- **Limit on Number of Proposals:** An organization may submit one proposal for each deadline.

AWARD INFORMATION

- **Anticipated Type of Award:** Standard or Continuing Grant
- **Estimated Number of Awards:** 20-25 grants per year; a mix of research, demonstration, dissemination, and planning.
- **Anticipated Funding Amount:** Approximately \$3.5 million for new grants, pending availability of funds.

PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

- **Full Proposals:** Supplemental Preparation Guidelines
 - The program announcement/solicitation contains supplements to the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full program announcement/solicitation for further information.

B. Budgetary Information

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

C. Deadline/Target Dates

- **Letters of Intent (*optional*):** December 19, 2001, February 19, 2002
- **Preliminary Proposals (*optional*):** None
- **Full Proposal Deadline Date(s):**

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| January 29, 2002 | Elementary and Middle School, Informal Education (K-12). Optional letter/email of intent due December 19, 2001. |
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| March 29, 2002 | High School, Undergraduate, Teacher and Faculty Development, and Educational Technologies. Optional letter/email of intent due February 19, 2002. |
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D. FastLane Requirements

- **FastLane Submission:** Required
- **FastLane Contact(s):**

- Ms. Vicki Smoot, Program Specialist, Education and Human Resources, Human Resource Development, Room 815, telephone: 703.292.4677, e-mail: vsmoot@nsf.gov.
- Ms. Jamie Scipio, Lead Program Assistant, Education and Human Resources, Human Resource Development, Room 815, telephone: 703.292.4675, e-mail: jscipio@nsf.gov.

PROPOSAL REVIEW INFORMATION

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

AWARD ADMINISTRATION INFORMATION

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

I. INTRODUCTION

One of the National Science Foundation's (NSF) key strategic goals is to invest in People: to develop a diverse, internationally competitive and globally-engaged workforce of scientists, engineers and well-prepared citizens (ref. NSF GPRA Strategic Plan, FY 2001-FY 2006). Thus investments are directed at programs that strengthen scientific and engineering research potential, and S&E education programs at all levels and in all S&E fields. These outcomes are essential to the Nation 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 aim to broaden the participation of traditionally underrepresented groups in SMET learning and in the SMET workforce. Programs are in place to address the learning, interest and participation of women, underrepresented minorities (African-American, Hispanic, Native American), and persons with disabilities, at all levels.

The Program for Gender Equity in Science, Mathematics, Engineering and Technology 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 SMET education from kindergarten through undergraduate education.

- Research projects in the area of gender-based barriers or incentives to learning science and mathematics are intended to advance our knowledge of how girls learn science and mathematics, in informal and formal educational settings, and what factors increase their interest to engage and persist in SMET studies.
- Demonstration projects apply research findings about girls' learning preferences in the design of new curriculum materials, services, pedagogy, or instructor development programs, which can be institutionalized and replicated if they are proven successful. In particular, teacher and faculty development demonstrations test new ways to integrate the understanding and awareness of gender-inclusive practices into pre-service and in-service professional development programs and into professional standards and policies. It is anticipated that participants in demonstration projects will benefit from the learning experience and assimilate new behaviors.
- Dissemination projects take material or model approaches or information to significant national audiences, especially to the broader education community.

II. PROGRAM DESCRIPTION

A. ISSUES

Issues of concern underlying the need for the Program include:

- Girls tend to lose interest in science during middle school;
- Relatively fewer girls enroll in elective and advanced high school science and mathematics courses to prepare for college;

- Relatively fewer girls enter undergraduate studies in SMET disciplines, particularly in physical sciences, computer sciences, and engineering;
- Disproportionately few of the young women who graduate in SMET disciplines continue on to attain graduate degrees in physical sciences, computer sciences, and engineering.

Statistical profiles of participation, with analyses, are documented in Trends in Educational Equity of Girls and Women (National Center for Education Statistics, U. S. Department of Education, NCES 2000-030) and the biannual publication Women, Minorities, and Persons with Disabilities in Science and Engineering (National Science Foundation, NSF 00-327), among others.

B. GOALS

The goal of the Program for Gender Equity in SMET (PGE) is to advance participation of women and girls in SMET, in accord with NSF's goal of a diverse science and engineering workforce. In the context of that overarching goal, the PGE program supports activities that address the following types of objectives.

Research

- To discover and describe gender-based differences and preferences in learning science and mathematics, K-16;
- To discover and describe barriers to female students' interest in and performance of science and mathematics skills in informal and formal educational settings;
- To increase the knowledge of organizational models that lead to more equitable and inviting SMET educational environments, K-16;
- To increase national research capacity in the field of gender and SMET education by encouraging new researchers and research-oriented education practitioners.

Demonstration

- To develop and evaluate research-based learning tools, pedagogical approaches and service or support programs that enhance the interest and persistence of female students in SMET studies through the undergraduate level;
- To evaluate methods of introducing instructional methodologies and teaching behaviors which research indicates may be particularly gender-equitable or female-friendly among informal science education providers, pre-service and in-service K-12 teachers, as well as pre-service or in-service undergraduate faculty;
- To evaluate methods of introducing research-based gender-equitable (and non-traditional) education and career counseling among adults (i.e., instructors, counselors, parents, etc.) who influence students in formal and informal educational settings.

Dissemination

- 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 SMET education and workforce, in order to inform educational practice;
- To catalyze new thinking and future action among educational institutions by convening conferences, workshops, or symposia that are not possible at regular meetings of professional societies.

The goals of PGE parallel those of many other education and diversity programs at NSF except that they emphasize gender aspects.

C. DESCRIPTION

RESEARCH

Proposals in the Research area may seek to enhance the multidisciplinary understanding of gender differences in human learning -- behavioral, cognitive, affective and social aspects -- through socio-psychological, ethnographic, statistical, anthropological, economic, and organizational studies. Proposals may employ methods from various disciplines in order to produce findings.

The effort should serve to provide a research foundation for educational approaches, curriculum materials, 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 (e.g., non-academic technological education). The research foundation is assumed to provide a strong base of support for sustained improvement in science and mathematics educational practice. Strong research designs will produce cumulative, reproducible, sustainable and scalable results.

Investigators might:

- Hypothesize and test whether girls have learning styles that are not accommodated in traditional approaches to teaching science and mathematics. For example, different conceptual strengths and weaknesses in learning certain math skills, different timing needs, different retention patterns, different preferences among computer interface features, stronger interests in social interaction while learning, and stronger interests in the social relevance and application of science experiments.
- Explore girls' social and psychological patterns in our society that affect learning. For example, issues of confidence and perception of difficulty regarding math, assumptions that certain skills are "unfeminine" or "for boys only."
- Explore the socialization of girls in our society that precludes or inhibits encouragement, support, and acceptance for their interest in math and science. For example, assumptions about appropriate careers, assumptions about the use of tools and technology, assumptions about the difficulties of embarking on a science or technology career.

Research Planning Grants. Research Planning Grants are available for activities required prior to development of a full research proposal. Planning Grants may include preliminary research, activity planning, development of collaborations, etc. The maximum award size is \$30,000 with award duration up to 18 months. Planning Grant proposals are to be written in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG).

DEMONSTRATION OR "MODEL" PROJECTS

Proposals for Demonstration projects will build on research findings and employ methods to determine the effectiveness of new learning tools, pedagogies, professional development programs, or student programs and services in order to produce outcomes. All applicants should review the section Outcome Measures.

Investigators might:

- Design informal and formal educational experiences that intervene and reverse traditional patterns of low participation; encourage girls' interest, enthusiastic participation, and election of continued study in math and science; increase confidence; and give girls positive images of math and science learning and careers.
- Design seminars, workshops, online courses, tutorials or other curriculum and approaches to teaching adults in the K-16 educational setting about the issues and interventions that are available. For example, adding modules to pre-service teacher education, developing standards for gender and multicultural teaching competency, conducting workshops combined with applied learning in student service programs for in-service teachers, holding seminars for pre-service and in-service undergraduate faculty, or mentoring between adults in order to assimilate new concepts and apply them in teaching practice.
- Work to integrate awareness of gender bias in educational environments, and change organizational commitment, policy, and action to remedy underrepresentation through student and faculty programs, for example, undergraduate departments in engineering, physical science, or computer science making a concentrated effort to increase recruitment and retention.
- Revise or produce new courses and curriculum that are gender-neutral or appeal particularly to girls and young women. For example, ways of teaching math that utilize girls' verbal skills, sequencing material in computer science to introduce real-world applications of technology before intricacies of programming languages, teaching young girls principles of engineering design and invention in everyday life.

Demonstration Planning Grants. Available for activities required prior to development of a full demonstration or "model" project proposal. Planning Grants may include activity planning, selection of evaluation methods to determine effectiveness, development of collaborations, etc. The maximum award size is \$30,000 with award duration up to 18 months. Planning Grant proposals are to be written in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG).

DISSEMINATION

Dissemination projects provide a mechanism for informing a wider audience about issues, research findings, and strategies for changing educational practice. Proposals for dissemination must justify a significant investment to reach a regional audience or national attention.

Investigators might:

- Organize a multidisciplinary meeting to consolidate knowledge about educational practice (related to female students in K-16 SMET) at a certain educational level. For example, a workshop on recruitment and retention in undergraduate engineering departments, a symposium on strategies for strengthening recruitment of women into computer science
- Develop a media presentation (e.g., radio, TV, video, web) that educates the public about girls' education in SMET and factors contributing to underrepresentation
- 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

D. COMMON THEMES ACROSS TYPES OF PROPOSALS

Innovation. Proposals are expected to make a case for innovation by reference to other research findings, other demonstration projects, and other dissemination activities.

Project Evaluation and Assessment. Proposals for research projects should include testable hypotheses and carry the expectation that the results obtained will be of sufficient significance to merit peer review and publication. Proposals for demonstration projects are expected to include an evaluation and assessment plan, and should plan to conduct formative evaluations to guide project development and summative evaluations to document impact. The plans should identify indicators or outcome measures that will be used to determine whether the demonstration was effective in meeting its objectives. The proposal should describe resources devoted to evaluation including allocations in the budget. Dissemination projects should evaluate their success in reaching target audiences and stimulating change.

Dissemination. All projects (research, demonstration, and dissemination) should include a dissemination plan to communicate findings and evaluation results to a national audience. 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 - journals, publications, web sites, professional association conferences -- and is committed (including allocating resources) to making sure that the investment in the project leads to this contribution and that peers in the research community will benefit.

Commitment and Collaboration. Larger projects will probably involve a collaboration between the submitting institution and others. Evidence of commitment from the submitting institution may be reflected in programmatic participation, release time of project staff, reduced indirect costs, provision of special services or resources, direct fiscal contributions or cost sharing. Evidence of commitment from collaborating partners may be reflected in letters of commitment,

direct fiscal contributions, and other resource contributions. In the case of large collaborations, it is useful to describe roles and relationships, and the management structure for the project.

Target Populations. Target populations in research, demonstration, or dissemination projects may be a mix of students, teachers, counselors, parents, community leaders, administrators, teacher-educators, faculty, student and adult mentors, and others. The target population - whether subjects or participants - should be described, especially if the project design is premised on special needs and interests based on educational level, ethnicity, rural/urban environment, and physical disabilities. Proposals addressing gender issues will be stronger if they also broaden participation based on other characteristics.

Leverage. Frequently a proposed project will leverage other initiatives or efforts, for example, build on a pilot or preliminary study or project. It is desirable to leverage related work. The investigator should make a clear distinction between prior investments, including funding, and the proposed work. The proposed work should be significantly different in innovation -- a new concept. If it appears that the proposal is simply continuing an effort (which may have run out of funding), then it does not meet the criterion of innovation. Scaling up a prior pilot project or study must be rationalized in the research or demonstration design. The program will not fund the replication of a prior demonstration project mainly to benefit a larger number of participants. For example, it is within our scope to support testing a curriculum which was developed for a narrow target age-economic-ethnic group by taking it to a different target group. It is not within our scope to take a summer program for girls proven to be effective in a given state to three other states.

E. OUTCOME MEASURES

The effort required for developing a research and evaluation plan and collecting, measuring, and reporting appropriate outcome data should be supported in the proposed budget. The following outcome measures are *illustrative*. See <http://oerl.sri.com> for evaluation resources collected for the benefit of NSF grantees.

Research

- * Findings on gender-based differences and preferences in learning
- * Findings on barriers to girls' interest and performance in learning
- * Findings on organizational/institutional change to incorporate gender-inclusive policies and practices
- * Development of human capacity (researchers in this field)

Demonstration

- * Institutionalization
 - Changed Policies and Practices
 - Continuing Partnerships

- Continued Funding from Other Sources

* Replication

- Demonstration activities or policies are adopted outside the project

* K-12 Student Outcomes:

- Change in Test Scores in Math and Science
- Change in Grades
- Student Confidence
- Student Interest in SMET Study
- Post-High School Plans
- Post-High School Status
- Student Perceptions about the Role of Females in SMET
- Parents' Report of Student Confidence
- Parents' Report of Student Interest

* K-12 Adult Outcomes:

- Improved Teaching
- Teacher Perceptions about the Role of Females in SMET
- Parents' Support for SMET Learning

* Post-Secondary Student Outcomes:

- Change in College Grades
- Student Confidence
- Degree Attainment
- Postgraduate Plans
- Postgraduate Status
- Student Perceptions about the Role of Females in SMET

* Post-Secondary Faculty Outcomes:

- Improved Teaching

- Faculty Perceptions about the Role of Females in SMET

Dissemination

- * Audience Reach and Impact on Knowledge or Attitudes
- * New Knowledge
- * New Institutional Policies and Practices Related to Gender and Diversity

III. ELIGIBILITY INFORMATION

An organization may not, in the same competition, submit as the primary performer on one proposal and as a collaborator on another proposal.

IV. AWARD INFORMATION

Research or demonstration grants may be up to \$900,000 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.

Dissemination proposals may request up to \$100,000 for up to 18 months.

A planning grant (up to \$30,000 for up to 18 months) is appropriate for an institution planning to submit a proposal for a large research or demonstration effort later. A planning grant does not imply an NSF commitment beyond the planning period. Planning grantees are expected to submit a proposal for a large grant subsequent to completion of the planning grant, within two competition years after award.

The proposed start dates should be at least seven months from the date of submission.

Funds should be budgeted for the principal investigator to attend a two-day grantees' meeting in Washington, D.C. area, each award year (usually in early October).

A limited equipment request is allowed for projects intensive in educational technologies, for development. Equipment for participants in demonstration programs and office equipment for project staff are expected to come from other sources.

PGE research projects are eligible for REU (Research Experiences for Undergraduates) supplements, which expressly support the participation of undergraduate students on the project research team. Please see the REU announcement for complete parameters and the method for making a request for an REU supplement (NSF 00-107).

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal:

Proposals submitted in response to this program announcement/solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal*

Guide (GPG). The complete text of the GPG is available electronically on the NSF Web Site at: <http://www.nsf.gov/cgi-bin/getpub?gpg>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

The Proposal Project Description should address:

- Project goals, outcome objectives, and a timeline for proposed activities
- An indication of anticipated findings (research projects), impact and outcome measures (demonstration projects), or impact and audience reach (dissemination)
- The basis or context or need for the proposed activity: what is the research base for the design of the proposed research or the proposed demonstration; or, what is the justification for a dissemination meeting or media product
- 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
- For collaborations, a management plan and descriptions of the roles of collaborating partners
- For demonstrations, plans for recruiting and selecting participants
- A dissemination plan to deliver outcomes to professional peers and the education community
- For prior grantees, a discussion of the results of prior work

The **Title** should be prefaced with an abbreviation identifying the PGE goal supported by the proposal:

- RES - social science or other SMET-discipline-based research on learning
- DEM - curriculum, pedagogy, educational program (informal or formal), or teacher enhancement demonstration
- DIS - dissemination (meeting, media product)
- PLN - planning

The **Project Summary** should:

- Name and describe the proposed activity (research, demonstration, dissemination, planning)
- Describe the target research subjects, participants, audience
- State the institutions involved

- Describe expected findings (or hypothesis), impact (and outcome measures), or audience feedback
- Especially highlight the innovation and the impact on knowledge, social, or human capital

Letters of commitment should be included in the Supplementary Documentation section of Fastlane.

Institutions that are or have been award recipients of NSF programs in education should explain the relationship between the proposed work and prior funded work. For example, recipients of grants to broaden participation of minorities or persons with disabilities should describe why funding for gender aspects is sought separately. Recipients of grants to develop curriculum should describe why incorporating gender-fair features requires separate funding. Prior grantees of PGE should emphasize the results of prior grants and describe the innovation, complementarity, and value added by the proposed work.

TWO COMPETITIONS PER YEAR

Proposals should be submitted to a competition based on the target age group and the type of proposed project. In cases where the scope of a proposal crosses age groups and combines types across the competitions described below, we encourage you to consult with the program directors for clarification as to which deadline would be more suitable.

JANUARY 29TH: ELEMENTARY and MIDDLE SCHOOL, INFORMAL EDUCATION (K-12)

Contact Dr. Margrete S. Klein for consultations. (Contact information is in Section VIII.) The scope is:

* Informal programs, K-12 (includes high school)

- museum programs
- after school programs
- summer programs
- career awareness
- mentoring

* Curriculum, K-8 (*except intensive applications of education technology*)

* Pedagogy, K-8

* Studies of learning and gender

* Dissemination with focus on any topic in this group

**MARCH 29TH:
HIGH SCHOOL, UNDERGRADUATE, TEACHER and FACULTY DEVELOPMENT,
and EDUCATIONAL TECHNOLOGIES**

Contact Dr. Ruta Sevo for consultations. (Contact information is in Section VIII.) The scope is:

* Curriculum and programs

- advanced science/math/technology in high school
- transitions from high school to undergraduate
- career awareness
- undergraduate
- workforce preparation
- transitions from undergraduate to graduate study

* Application of educational technologies K-16

- online learning for girls, young women, and adults
- web-based environments for girls

* Professional development of adults (in-service and pre-service)

- K-12 teacher education and enhancement
- Counselor training
- Faculty professional development

* Studies of organizational and institutional change to incorporate gender inclusive values

* Dissemination with focus on any topics in this group

Proposers are reminded to identify the program solicitation number (NSF 01-130) in the program announcement/solicitation block on the proposal Cover Sheet (NSF Form 1207). Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

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

Other Budgetary Limitations: Research or demonstration budgets may be up to \$900,000, pending availability of funds. Funds should be budgeted for the principal investigator to attend a two-day grantee's meeting in Washington, D.C. area, each award year (usually in October). A limited equipment request may be allowed. (See Section IV.

C. Deadline/Target Dates

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

Letters of Intent (*optional*): December 19, 2001, February 19, 2002

Full Proposals by 5:00 PM local time:

| | |
|------------------|---|
| January 29, 2002 | Elementary and Middle School, Informal Education (K-12). Optional letter/email of intent due December 19, 2001. |
| March 29, 2002 | High School, Undergraduate, Teacher and Faculty Development, and Educational Technologies. Optional letter/email of intent due February 19, 2002. |

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this Program Announcement through the FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at: <http://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane user support, call 1-800-673-6188 or e-mail fastlane@nsf.gov.

Submission of 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 certifications within five working days following the electronic submission of the proposal. Further instructions regarding this process are available on the FastLane website at: <http://www.fastlane.nsf.gov>.

VI. PROPOSAL REVIEW INFORMATION

A. NSF Proposal Review Process

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

Proposals will be reviewed against the following general review criteria established by the National Science Board. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Each reviewer will be asked to address only those that are relevant to the proposal and for which he/she 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?

Principal Investigators should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to both of the above-described NSF merit review criteria. NSF staff will give these elements careful consideration 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

As reviewers apply the review criteria established by the National Science Board, they will also consider the extent to which the proposed project addresses the objectives of the Program for Gender Equity in SMET (see Section II).

A summary rating and accompanying narrative will be completed and signed by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are sent to the Principal Investigator/Project Director by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

B. Review Protocol and Associated Customer Service Standard

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this announcement/solicitation will be reviewed by 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.

In most cases, proposers will be contacted by the Program Officer after his or her recommendation to award or decline funding has been approved by the Division Director. This informal notification is not a guarantee of an eventual award.

NSF is striving to be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 70 percent of proposals. The time interval begins on the date of receipt. The interval ends when the Division Director accepts the Program Officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at its own risk.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See section VI.A. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award letter, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable award conditions, such as Grant General Conditions (NSF-GC-1)* or Federal Demonstration Partnership (FDP) Terms and Conditions * and (5) any announcement or other NSF issuance that may be incorporated by reference in the

award letter. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

*These documents may be accessed electronically on NSF's Web site at http://www.nsf.gov/home/grants/grants_gac.htm. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Web site at <http://www.nsf.gov/cgi-bin/getpub?gpm>. The GPM is also for sale through the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Web site at <http://www.gpo.gov>.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period.

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Approximately 30 days before expiration, NSF will send a notice to remind the PI of the requirement to file the final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

NSF has implemented an electronic project reporting system, available through FastLane. This system permits electronic submission and updating of project reports, including information on project participants (individual and organizational), activities and findings, publications, and other specific products and contributions. PIs will not be required to re-enter information previously provided, either with a proposal or in earlier updates using the electronic system.

VIII. CONTACTS FOR ADDITIONAL INFORMATION

General inquiries regarding Program for Gender Equity in Science, Mathematics, Engineering and Technology (FY 2002) should be made to:

- Dr. Margrete S. Klein, Elementary and Middle School, Informal Education (K-12), Program Director, Education and Human Resources, Human Resource Development, Room 815, telephone: 703.292.8637, e-mail: mklein@nsf.gov.
- Dr. Ruta Sevo, High School, Undergraduate, Teacher and Faculty Development, and Educational Technologies, Program Director, Education and Human Resources, Human Resource Development, Room 815, telephone: 703.292.4676, e-mail: rsevo@nsf.gov.

For questions related to the use of FastLane, contact:

- Ms. Vicki Smoot, Program Specialist, Education and Human Resources, Human Resource Development, Room 815, telephone: 703.292.4677, e-mail: vsmoot@nsf.gov.
- Ms. Jamie Scipio, Lead Program Assistant, Education and Human Resources, Human Resource Development, Room 815, telephone: 703.292.4675, e-mail: jscipio@nsf.gov.

IX. OTHER PROGRAMS OF INTEREST

The NSF *Guide to Programs* is a compilation of funding for research and education in science, mathematics, and engineering. The NSF *Guide to Programs* is available electronically at <http://www.nsf.gov/cgi-bin/getpub?gp>. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter.

Many NSF programs offer announcements or solicitations concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the *Guide to Programs* will be announced in the NSF [E-Bulletin](#), which is updated daily on the NSF web site at <http://www.nsf.gov/home/ebulletin>, and in individual program announcements/solicitations. Subscribers can also sign up for NSF's [Custom News Service](#) (<http://www.nsf.gov/home/cns/start.htm>) to be notified of new funding opportunities that become available.

The Program for Gender Equity in SMET is among those that promote the participation of underrepresented groups and foster innovation in education for all students through research and demonstration projects. For a complete list of programs in Education and Human Resources see <http://www.ehr.nsf.gov/prog.asp>. For a complete list of programs in the Division for Human Resource Development see <http://www.ehr.nsf.gov/ehr/hrd/>.

The following programs in particular might be of interest:

- ADVANCE: Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers (NSF 01-69)
- Activities in Science, Engineering, and Mathematics for Persons with Disabilities (NSF 01-67)
- Research on Learning and Education (ROLE) (NSF 00-17)
- Societal Dimensions of Engineering, Science and Technology (NSF 99-82)
- Information Technology Workforce (NSF 01-33)
- National Science, Mathematics, Engineering, and Technology Education Digital Library (NSDL) (NSF 01-55)

- Course, Curriculum, and Laboratory Improvement (CCLI) (NSF 01-58)
- The Elementary, Secondary, and Informal Education Program Solicitation and Guidelines (NSF 01-60)
- CISE Educational Innovation Program (NSF 00-33)
- The Action Agenda for Systemic Engineering Education Reform (NSF 99-169)
- Opportunities for Enhancing Diversity in the Geosciences (OEDG) (NSF 01-36)
- Vertical Integration of Research and Education in Mathematical Sciences (VIGRE) (NSF 01-104)
- Research Experiences for Undergraduates (REU) (NSF 00-107)
- Advanced Technological Education Program (ATE) (NSF 01-52)
- Computer Science, Engineering, and Mathematics Scholarships (CSEMS) (NSF 01-62)
- NSF Graduate Teaching Fellows in K-12 Education (GK-12) (NSF 01-114)

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Awardees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities and persons with disabilities to compete fully in its programs. In accordance with Federal statutes, regulations and NSF policies, no person on grounds of race, color, age, sex, national origin or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from NSF (unless otherwise specified in the eligibility requirements for a particular program).

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the program announcement/solicitation for further information.

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, or (800) 281-8749, FIRS at 1-800-877-8339.

The National Science Foundation is committed to making all of the information we publish easy to understand. If you have a suggestion about how to improve the clarity of this document or other NSF-published materials, please contact us at plainlanguage@nsf.gov.

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register

268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

Pursuant to 5 CFR 1320.5(b), an agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Information Dissemination Branch, Division of Administrative Services, National Science Foundation, Arlington, VA 22230, or to Office of Information and Regulatory Affairs of OMB, Attention: Desk Officer for National Science Foundation (3145-0058), 725 17th Street, N.W. Room 10235, Washington, D.C. 20503.

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