NSF GRADUATE TEACHING FELLOWS IN K-12 EDUCATION (GK-12)

Program Solicitation

NSF 07-555

Replaces Document(s):

NSF 06-556

National Science Foundation

Directorate for Education & Human Resources
Division of Graduate Education

Directorate for Biological Sciences

Directorate for Computer & Information Science & Engineering

Directorate for Engineering

Directorate for Geosciences

Directorate for Mathematical & Physical Sciences

Directorate for Social Behavioral & Economic Sciences

Office of Polar Programs

Office of International Science and Engineering

Office of Cyberinfrastructure

Letter of Intent Due Date(s) ***(required):***

May 16, 2007

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

July 02, 2007

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.

1. Nature of award, size, and duration (Program Description, Section II):

   - "The GK-12 program will offer only new awards of 5 years duration with a maximum of $600,000 per year. We are no longer offering Track 1, Track 2, or Continuing funding as in previous years.

2. Text has been added and edited to further clarify the program. These revisions include (Program Description, Section II):

    - Collaboration skills have been included as part of project outcomes (e.g., "improved communication, teaching, collaboration, and team building skills for fellows").
    - A focus on graduate fellows from STEM disciplines has been included in the solicitation (e.g., "integration of fellows' STEM research in K-12 schools").
    - "The GK-12 program allows PIs to involve fellows and teachers in international research experiences in their new proposals. In addition, the program will continue to offer supplementary funding to currently active awards for international research activities."
    - "The GK-12 program also offers opportunities to PIs to include a cyberinfrastructure component in their proposals (see *Revolutionizing Science and Engineering Through Cyberinfrastructure: Report of the National Science Foundation Blue Ribbon Advisory Panel on Cyberinfrastructure*, http://www.nsf.gov/od/oci/reports/toc.jsp). For example, PIs may incorporate their fellows' cyberinfrastructure research activities and tools, such as those involving high performance computing, digital data collection and observation tools, advanced data curation and visualization technologies, and virtual interaction and collaboration, to support learning, discovery, and broadening participation in K-12 schools."

3. Text has been added and edited to help PIs on the recruitment of fellows. This revision includes (Eligibility Information, Section IV):

    - "The GK-12 program is ideally suited for fellows who have completed their basic graduate course work and who have experience conducting STEM research."

4. Text involving international and cyberinfrastructure components has been added (Proposal Preparation and Submission Instructions, Section V):

    - "For projects that include an international component, describe the procedures and arrangements for sending teams of GK-12 fellows and teachers to international research sites. Discuss how specific international projects and activities will be determined for fellows and teachers teams, how STEM disciplinary research advisors will be involved, and the benefits of such an international experience for fellows and teachers. In addition, address the practicial aspects of sending United States fellows and teachers abroad, including logistical arrangements, language and cultural issues, and related administrative requirements. PIs must clearly indicate how the specific research activities of fellows are incorporated in the international component."
    - "For projects that include a cyberinfrastructure component, PIs must clearly describe how they plan to integrate fellows' cyberinfrastructure research activities and tools, such as those relating to high performance computing and virtual interaction and collaboration, in GK-12 project activities. Discuss the benefits for including the cyberinfrastructure component for both graduate fellows and K-12 teachers and students."

5. Text has been added and edited to help PIs on their evaluation plans. This revision includes (Proposal Preparation and Submission Instructions, Section V):

    - The evaluation plan must include a timeline, and the "evaluator must be external to the project to provide an objective evaluation. The project must include formative and summative evaluations. The purpose of the formative evaluation is to assess initial and ongoing project activities. The purpose of the summative evaluation is to assess the quality and impact of the project in reaching its stated goals and objectives. The proposal must clearly describe the qualifications of the evaluator."

6. Text has been added and edited to help PIs on budget preparation. These changes include (Budget Information, Section V):
    - "The budget should plan for adequate funds to conduct the project evaluation (e.g., 5% of the total amount requested per year)."

    - "For projects that include an international component, a total of up to $100,000 for the duration of the project may be additionally requested for international activities and administrative support for participants from the United States (e.g., STEM graduate fellows and K-12 teachers). PIs should include a letter of support and a biographical sketch of the international partner."

7. Two other related programs are included to further help PIs (Other Information, Section IX): Partnerships for International Research and Education (PIRE) and Cyberinfrastructure Training, Education, Advancement, and Mentoring for Our 21st Century Workforce (CI-TEAM).

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

NSF GRADUATE TEACHING FELLOWS IN K-12 EDUCATION (GK-12)

Synopsis of Program:

This program provides funding to graduate students in NSF-supported science, technology, engineering, and mathematics (STEM) disciplines to acquire additional skills that will broadly prepare them for professional and scientific careers in the 21st century. Through interactions with teachers and students in K-12 schools and with other graduate fellows and faculty from STEM disciplines, graduate students can improve communication, teaching, collaboration, and team building skills while enriching STEM learning and instruction in K-12 schools. Through this experience, graduate students can gain a deeper understanding of their own STEM research. In addition, the GK-12 program provides institutions of higher education with an opportunity to make a permanent change in their graduate programs by incorporating GK-12 like activities in the training of their STEM graduate students. **Expected outcomes include improved communication, teaching, collaboration, and team building skills for the fellows; professional development opportunities for K-12 teachers; enriched learning for K-12 students; and strengthened and sustained partnerships in STEM between institutions of higher education and local school districts.**

Cognizant Program Officer(s):

- Sonia Ortega, Program Director, Division of Graduate Education, Directorate for Education and Human Resources, 875 S, telephone: (703) 292-8697, fax: (703) 292-9048, email: sortega@nsf.gov

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

- 47.041 --- Engineering
- 47.049 --- Mathematical and Physical Sciences
- 47.050 --- Geosciences
- 47.070 --- Computer and Information Science and Engineering
- 47.074 --- Biological Sciences
- 47.075 --- Social, Behavioral and Economic Sciences
- 47.076 --- Education and Human Resources
- 47.078 --- Office of Polar Programs
- 47.079 --- Office of International Science and Engineering
- 47.080 --- Office of Cyberinfrastructure

Award Information

Anticipated Type of Award: Continuing Grant

Estimated Number of Awards: 25 new awards, depending upon the quality of proposals and availability of funds.

Anticipated Funding Amount: $16,000,000 approximately in FY 2008 (pending availability of funds).

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- Academic institutions in the United States and its territories that grant masters or doctoral degrees in STEM disciplines supported by the National Science Foundation

PI Limit:

The Principal Investigator (PI) must be a faculty member in a STEM discipline at the lead institution.

Limit on Number of Proposals per Organization:

One per institution. New proposals only. Proposals to continue previously funded GK-12 projects (i.e., Track 1, Track 2, and Continuing) are no longer being accepted.

Limit on Number of Proposals per PI:

None Specified

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Submission of Letters of Intent is required. Please see the full text of this solicitation for further information.
- **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

- **Letter of Intent Due Date(s)** ***(required):***

  May 16, 2007

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

  July 02, 2007

Proposal Review Information Criteria

Merit Review Criteria: National Science Board approved criteria. Additional merit review considerations apply. Please see the full text of this solicitation for further information.

Award Administration Information

Award Conditions: Standard NSF award conditions apply

Reporting Requirements: Additional reporting requirements apply. Please see the full text of this solicitation for further information.

TABLE OF CONTENTS

I. INTRODUCTION

The National Science Foundation (NSF) recognizes that graduate students in science, technology, engineering and mathematics (STEM) must be prepared with the necessary skills to face the career challenges of the 21st century. In addition to research competencies, STEM graduate students must be able to communicate science and their research findings not only to other scientists but also to the general public. NSF also recognizes that STEM graduate students can contribute to the national effort to advance scientific knowledge in K-12 schools through partnerships with K-12 teachers. These partnerships offer graduate students an opportunity to bring leading-edge research practices and findings to K-12 classrooms and to integrate those practices and findings with the teaching of STEM in K-12 schools. These interactions also stimulate interest in STEM disciplines among K-12 students. To support these opportunities, NSF continues to offer the Graduate Teaching Fellows in K-12 Education (GK-12) program.

Through the GK-12 program, institutions of higher education have an opportunity to make a permanent change in STEM graduate education programs and to create strong and enduring partnerships with K-12 schools.

GK-12 is one of three major fellowship/traineeship programs offered and managed by NSF's Division of Graduate Education (DGE) in the Directorate for Education and Human Resources (EHR). GK-12 is an NSF-wide activity supported by the Directorates for Education and Human Resources (EHR), Biological Sciences (BIO), Computer and Information Science and Engineering (CISE), Engineering (ENG), Geosciences (GEO), Mathematical and Physical Sciences (MPS), Social, Behavioral and Economic Sciences (SBE), the Office of Polar Programs (OPP), the Office of International Science and Engineering (OISE), and the Office of Cyberinfrastructure (OCI). Additional information concerning the program can be found on the GK-12 Program Home Page (http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5472&from=fund) or the American Association for the Advancement of Science (AAAS) GK-12 website (http://www.nsfgk12.org)

II. PROGRAM DESCRIPTION

The objectives of the GK-12 program are: 1) to support highly qualified graduate students in NSF-supported STEM disciplines through fellowships to provide them with an opportunity to acquire additional skills that will broadly prepare them for professional and scientific careers in the 21st century; 2) to improve STEM instruction in K-12 schools; and 3) to provide institutions of higher education with an opportunity to make a permanent change in their graduate programs by incorporating GK-12 like activities in the training of their STEM graduate students. Expected project outcomes include:

- improved communication, teaching, collaboration, and team building skills for fellows;
- integration of fellows' STEM research in K-12 schools;
- content gain and professional development opportunities for K-12 teachers;
- enriched learning by K-12 students; increased interest in STEM disciplines and careers by K-12 students;
- incorporation of GK-12 like activities as an integral part of the institution's graduate programs in STEM;
- strengthened and sustained partnerships in STEM between higher education institutions and local school districts; and
- reporting of project activities and outcomes to promote best practices in STEM graduate education.

GK-12 fellows from STEM disciplines, selected by awardee institutions, will work directly with K-12 teachers in and out of the classroom to, for example: integrate scientific methods in the teaching and learning of STEM disciplines; provide role models for future STEM professionals; enhance K-12 teachers' STEM content knowledge and understanding of principles of mathematics and the sciences; and jointly design and deliver K-12 STEM instruction. In essence, fellows will bring their scientific research experience to the schools, so that teachers and K-12 students are more broadly exposed to what science is all about, how science is done, how discoveries happen and what scientists do. The GK-12 program is an opportunity to bring the excitement and the results of STEM research to schools and to create changes both in K-12 schools and in institutions of higher education. It is also an opportunity for fellows to acquire skills that normally are not emphasized in a more traditional STEM graduate program and to broaden their career options as professional scientists and engineers.

PIs from STEM disciplines, university and school administrators, K-12 teachers and other STEM faculty must work together in the development of the GK-12 proposal. PIs may also involve education faculty in the proposal development process. It is strongly recommended that a partnership among all potential parties involved in the proposed project be developed early. For example, PIs and school administrators are encouraged to discuss such issues as the types of incentives and resources necessary to support participation of teachers in GK-12 projects and the projects that will best serve the needs of the participating teachers and schools, especially those serving students from underrepresented groups.

Although training activities on the campus of an institution of higher education may be part of the project plan, it is expected that the preponderance of fellows' activities with teachers and students will occur in K-12 schools. It is understood that STEM research advisors will be supportive of fellows' activities in K-12 schools. PIs are encouraged to establish collaborative arrangements with other institutions (e.g., industry, non-profit organizations, and museums) to support their activities.

The GK-12 program will offer only new awards of 5 years duration with a maximum of $600,000 per year. We are no longer offering Track 1, Track 2, or Continuing funding as in previous years.

The GK-12 program allows PIs to involve fellows and teachers in international research experiences in their new proposals. In addition, the program will continue to offer supplementary funding to currently active awards for international research activities. PIs may contact NSF's Office of International Science and Engineering (OISE) staff with expertise in the country or region of interest for information about institutions and counterpart agencies. (Contacts for cognizant program manager(s) are available from the OISE Home Page, http://www.nsf.gov/div/index.jsp?div=OISE.)

The GK-12 program also offers opportunities to PIs to include a cyberinfrastructure component in their proposals (see *Revolutionizing Science and Engineering Through Cyberinfrastructure: Report of the National Science Foundation Blue Ribbon Advisory Panel on Cyberinfrastructure*, http://www.nsf.gov/od/oci/reports/toc.jsp). For example, PIs may incorporate their fellows' cyberinfrastructure research activities and tools, such as those involving high performance computing, digital

data collection and observation tools, advanced data curation and visualization technologies, and virtual interaction and collaboration, to support learning, discovery, and broadening participation in K-12 schools.

III. AWARD INFORMATION

A. Number and Size of Awards

The number of awards will vary depending upon the scope of projects and availability of funds. It is anticipated that approximately 25 new awards will be made, depending upon the quality of proposals and availability of funds. The size for the new projects will be for up to $600,000 per year for 5 years.

The anticipated funding amount in FY2008 is $16 million, pending availability of funds.

B. Stipends and Allowances

The stipend for a graduate student will be $30,000 for the 12-month tenure. NSF also provides a cost-of-education allowance for tuition, health insurance, and normal fees of $10,500 per year per student (for 12 months). If this allowance is not fully required, then it may be used to support other GK-12 related activities, such as professional development training for fellows and teachers. All fellows will spend a maximum of fifteen hours per week directly involved in GK-12 projects. It is recommended that fellows spend ten of the fifteen hours in a physical location where learning takes place.

The recommended stipend for a GK-12 teacher is 15% of the funds allocated for a fellow's stipend (i.e., 15% of $30,000 or $4,500 per year). The stipends for GK-12 teachers may support participation in summer educational institutes, travel support for professional meetings, involvement in weekend and evening workshops, and after-hours mentoring of fellows through the project.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- Academic institutions in the United States and its territories that grant masters or doctoral degrees in STEM disciplines supported by the National Science Foundation.

PI Limit:

The Principal Investigator (PI) must be a faculty member in a STEM discipline at the lead institution.

Limit on Number of Proposals per Organization:

One per institution. New proposals only. Proposals to continue previously funded GK-12 projects (i.e., Track 1, Track 2, and Continuing) are no longer being accepted.

Limit on Number of Proposals per PI:

None Specified

Additional Eligibility Info:

A. Academic Institutions*

Academic institutions in the United States and its territories that grant masters or doctoral degrees in STEM disciplines supported by NSF are eligible to apply. Projects may involve more than one institution, but a single institution must accept overall management responsibility. An institution may submit only one proposal as lead from either a single-institution or from a multi-institutional proposal.

Non-academic institutions, industry, non-profit organizations and museums may serve as collaborating organizations.

*An academic institution is defined as a separate legal and fiscal entity, whether at the central or system level, or branch campus level, which can receive awards and which is separately and consistently identified at that level for federal research and development reporting purposes through a Federal Entity Number. NSF institution codes ARE NOT entity numbers.

B. Project Focus

Projects involving any of the STEM fields normally supported by NSF are eligible. Projects may draw participants from two or more departments within one institution or from more than one institution. Projects may be organized on a single, multidisciplinary, or interdisciplinary STEM theme. Theme(s) should involve a diverse group of fellows and faculty from STEM disciplines. Projects focused on multidisciplinary or interdisciplinary themes are encouraged.

C. Principal Investigator

The PI must be a faculty member in a STEM discipline at the lead institution and should serve as the director of the GK-12 project. Any appropriate faculty or administrator at universities, K-12 schools, or partnership institutions may serve as Co-PI.

D. Graduate Fellows

GK-12 fellows will be selected by awardee institutions. During their tenure as fellows, they must be full time graduate students pursuing degrees (master's or PhD) and conducting research in STEM disciplines. The GK-12 program is ideally suited for fellows who have completed their basic graduate course work and who have experience conducting STEM research.

Fellows are expected to be supported on any GK-12 award for a minimum of one year and a maximum of two years. Fellows must be citizens, nationals or permanent residents of the United States. Foreign students who hold student visas are not eligible.

Graduate students pursuing degrees and conducting research in science education (e.g., physics education), technology education, engineering education, and mathematics education are not eligible.

Institutions are encouraged to recruit, mentor, and retain fellows that are women, underrepresented minorities, or persons with disabilities.

E. GK-12 Teachers

GK-12 teachers should have sufficient experience in pedagogy to help improve the communication, teaching, collaboration, and team building skills of the GK-12 fellows.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent*(required):*

Letters of Intent must be submitted via the NSF FastLane System, even if full proposals will be submitted via Grants.gov. A Letter of Intent (LOI) is required for all new proposals including those that were declined in previous years and are re-

applying to the program. The LOI is not a preliminary proposal.

Include in the "Synopsis" section of the LOI Fastlane template, an overview of the proposed project, its goals and objectives, and innovative aspects of the project. Indicate how STEM knowledge and research experience will be brought to the classrooms by the fellows.

The LOI must also contain the following in the "Other Comments" section of the Fastlane template:

Title of Project:

Co-PI(s):

STEM Faculty advisors and departments involved:

Number of STEM graduate fellows per year:

Number of K-12 teachers working with the fellows per year:

Number of K-12 classes anticipated to be served per year:

Number of Schools and School District Partners:

Target audience of the project (elementary, middle, and high school grades):

Setting: Urban, suburban, or rural

NSF-supported STEM discipline(s) or theme(s) involved:

The GK-12 Program Directors will use the Letters of Intent to guide the selection of reviewers. PIs should not expect feedback on their Letters of Intent beyond acknowledgement of their receipt.

Letters of Intent should serve as a basis for the Project Summary section (below).

Letters of Intent must be submitted via the LOI module in FastLane (http://www.fastlane.nsf.gov/) and must be received by May 16, 2007.

Letter of Intent Preparation Instructions:

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

- SPO Submission is Not Required when submitting Letters of Intent
- Institution Name is Required when submitting Letters of Intent
- PI Name is Required when submitting Letters of Intent
- Submission of multiple Letters of Intent are Not allowed

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

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG). The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov. Proposers are reminded to identify this program solicitation number in the program solicitation block on the NSF Cover Sheet For Proposal to the National Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (http://www.nsf.gov/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.

The following information supplements the Grant Proposal Guide and the NSF Grants.gov Application Guide.

Proposals must contain the following elements in the order indicated. Proposals that do not strictly adhere to the specified page and font limitations (given below) will be ineligible for consideration and will be returned without review.

1. **COVER SHEET FOR PROPOSALS**: Proposers must identify the program solicitation number stated at the beginning of this document in the program solicitation block on the proposal Cover Sheet. In the title section of the Cover Sheet, enter "New, GK-12" at the beginning of the proposal title.

2. **PROJECT SUMMARY:** This section, limited to one single-spaced page, prepared in a standard font (no smaller than Times New Roman 12), must be suitable for publication and should contain two sections (see below): 1) a List of Project Elements, followed by 2) a Project Summary.

   List of Project Elements

   Title of Project:

   Institution:

   PI and Co-PI(s):

   STEM faculty advisors and departments involved:

   Number of STEM graduate fellows per year:

   Number of K-12 teachers working with the fellows per year:

   Number of K-12 classes anticipated to be served per year:

   Number of Schools and School District Partners:

   Target audience of the project (elementary, middle, and high school grades):

   Setting: Urban, suburban, or rural

   NSF-supported STEM discipline(s) and theme(s) involved:

   Project Summary: Include a brief description of the project, objectives, STEM research/disciplinary theme(s), and innovative aspects of the project. Indicate how fellow-teacher partnerships will be initiated and enhanced during the lifetime of the project. Describe how the fellows will integrate their STEM knowledge and research experience into the K-12 STEM classes. **Explicitly indicate in separate statements the intellectual merit and broader impacts of the project proposed. NSF will return without review proposals that fail to address both of these criteria in the summary.** Include benefits to be achieved by all participants in the project: the fellows, teachers, K-12 students, STEM faculty, and K-12 and higher education institutions. If the proposal is funded, NSF staff will edit the Project Summary, and will publish it along with abstracts of other awards.

3. **PROJECT DESCRIPTION:** This section is limited to 15 single spaced pages including any visual materials. It must be prepared in standard font no smaller than Times New Roman 12. The Project Description should include the following subsections (a-h):

   a. **Results from Prior NSF Support**: Provide information about relevant funding that the PI or Co-PI(s) received during the past five years related to GK-12 activities. For each project cited indicate the NSF award number, amount and period of support and PIs, Co-PIs, and/or partner organizations involved. Indicate how the proposed project is different than previously funded NSF proposals.

   b. **Goals and Objectives:** Provide the conceptual focus, goals, and objectives of the project. Describe the STEM research/disciplinary theme(s) and activities that will form the foundation for the project.

   c. **Project Plan:** It is important to indicate in this section not only what STEM activities will be conducted but also how they will be implemented. Include STEM disciplinary theme(s) addressed and mechanisms of operation. Indicate the number of fellows that will be available in any given school district and the specific schools involved. Indicate how the fellows will be recruited, selected, mentored, and assigned to schools and classes. Outline plans to prepare fellows to bring STEM findings, scientific methodology and leading-edge research experience into K-12 schools.

      Incorporate training activities for fellows including communication, collaboration, and team building, methods for scientific inquiry, pedagogical skills and cultural competency (where appropriate). Clearly state what the fellows will be doing and how they will enhance K-12 STEM knowledge and instruction in the specified schools and school district, including as appropriate, their role in implementing inquiry-based instructional strategies and materials. Describe how fellows activities will contribute to deeper understanding of their own scientific research. Projects should also plan for activities that will contribute to fellows' leadership skills. Describe workshops and professional development activities for GK-12 teachers.

      Describe the level and type of participation by the institution(s) of higher education, K-12 school district(s), and any collaborating organization(s). Indicate any relevant history of the higher education department(s) in K-12 involvement and how the proposed activities will be aligned with educational needs of K-12 schools. Describe how the project will be aligned with mathematics and science standards established by national organizations, states and school districts. Describe implementation plans involving special populations in K-12 schools (e.g., women, underrepresented minorities, students at risk, with disabilities, with English as second language, etc.).

      Clarify in sufficient detail the benefits to fellows in STEM disciplines, GK-12 teachers, universities and K-12 schools.

      Indicate how you plan to implement GK-12 type activities as an integral part of the institution's STEM graduate education program(s); how you plan to establish K-12 and university partnerships; and how they will serve as a mechanism to advance STEM education.

      Indicate how participating fellows, GK-12 teachers and schools will be followed longitudinally to determine indicators of project impact and sustainability such as: length of time that fellows take to degree completion compared to other graduate students, career choices and the use of newly acquired skills; increased teacher expertise in STEM disciplines, teaching methods adapted, participation in professional development activities in STEM; number of schools or teachers requesting GK-12 partnerships, changes in student STEM interest and competence level; number of faculty and students participating in GK-12 activities, changes in faculty and/or department support and practices related to GK-12 activities, and overall impact on the institution.

      Indicate strategies to develop partnerships with other organizations (e.g., industry partners) as potential collaborators and future sources of funding for project sustainability.

      For projects that include an international component, describe the procedures and arrangements for sending teams of GK-12 fellows and teachers to international research sites. Discuss how specific international projects and activities will be determined for fellows and teachers teams, how STEM disciplinary research advisors will be involved, and the

benefits of such an international experience for fellows and teachers. In addition, address the practical aspects of sending United States fellows and teachers abroad, including logistical arrangements, language and cultural issues, and related administrative requirements. PIs must clearly indicate how the specific research activities of fellows are incorporated into the international component.

For projects that include a cyberinfrastructure component, PIs must clearly describe how they plan to integrate fellows' cyberinfrastructure research activities and tools, such as those relating to high performance computing and virtual interaction and collaboration, in GK-12 project activities. Discuss the benefits for including the cyberinfrastructure component for both graduate fellows and K-12 teachers and students.

d. **Recruitment and Selection:** Describe specific plans, procedures, and criteria for the recruitment and selection of fellows, including specific provisions for success with women, underrepresented minorities and persons with disabilities. Provide reasonable estimates of the number of potential fellows eligible and likely to be interested in participating. Describe the nature and extent of connections with existing programs at their institutions, particularly those supported by NSF, that involve recruitment, mentoring, retention and professional development of students such as Alliances for Graduate Education and the Professoriate (AGEP), Louis Stokes Alliances for Minority Participation (LSAMP), Tribal Colleges and Universities Program (TCUP), Historically Black Colleges and Universities Undergraduate Program (HBCU-UP), and the Centers for Research Excellence in Science and Technology (CREST). Also describe plans for the recruitment and selection of GK-12 teachers.

e. **Organization, Management, and Institutional Commitment**: The PI will have overall responsibility for the administration of the award, the management of the project, and interactions with the NSF. The PI and the home institution are expected to develop an administrative structure that enables faculty, GK-12 teachers, school administrators, fellows, and others involved in the group effort to interact productively during the award period. The PI is expected to be an integral participant in the education and training activities of the GK-12 project. Include plans and procedures for the development of a management team for the proposed activity indicating how the responsibilities among team members will be allocated (e.g., who will select the fellows, who will coordinate activities of fellows and GK-12 teachers, how fellows advisors will be involved).

Include a statement from the institution of higher education (such as from the Provost or a Dean) that the NSF funds will not replace financial resources already assigned to STEM education. Provide a similar statement from the superintendent of the K-12 district. The statement(s) with the original signature may be electronically scanned and incorporated as a PDF file into the Supplementary Documentation (see item 7 below).

Describe how the activities will be sustained after the period of NSF funding. Provide a clear statement elaborating which of the proposed activities are likely to be institutionalized by the end of the grant period, and which of the proposed activities will require further sources of support in order to be continued.

f. **Evaluation:** Describe an evaluation plan, including a timeline, to assess the project s success in meeting its goals and objectives. Each project should include an external evaluator to develop an evaluation plan. This evaluator must be external to the project to provide an objective evaluation. The project must include formative and summative evaluations. The purpose of the formative evaluation is to assess initial and ongoing project activities.The purpose of the summative evaluation is to assess the quality and impact of the project in reaching its stated goals and objectives. The proposal must clearly describe the qualifications of the evaluator.

Both the formative and summative evaluations should include qualitative and quantitative components. The qualitative and quantitative components should capture the perspectives and benefits for the fellow and the K-12 Teacher. It is also recommended that the involvement of STEM faculty advisors and K-12 administrators participating in the project be evaluated. The evaluation plan should describe performance indicators and other specific measures that will be used by the project team to assess the project's success in meeting its goals and objectives. Although each project should propose its own types of specific qualitative and quantitative measures, some later standardization is anticipated so that NSF can conduct a program-wide evaluation of effectiveness.

g. **List of Faculty Participants:** Include STEM departmental and institutional affiliation of all faculty

participants expected to mentor fellows or to otherwise play an important role in the project. Indicate how the fellows research advisors will be involved and how they will provide feedback to the fellows. Fellows research advisors are expected to observe how fellows present their research findings, scientific concepts and methodology to K-12 students. In addition, research advisors are encouraged to attend fellows presentations on their GK-12 experience at the end of their tenure. Research advisors are encouraged to engage with the fellows in discussions regarding career development opportunities. They are also encouraged to collaborate with the GK-12 external evaluator in the assessment of fellows development of professional skills (communication, teaching, collaboration, team building).

h. **School District Involvement:** Include a brief summary of school district participation and a list of participating schools. A statement from the superintendent(s) of the participating K-12 school district (s) must also be included with the application. The statement(s) with the original signature may be electronically scanned and incorporated as a PDF file into the Supplementary Documentation (see item 7 below).

4. **REFERENCES CITED:** Any literature cited should be specifically related to the proposed project, and the Project Description should make clear how each reference has played a role in the motivation for or design of the project.

5. **BIOGRAPHICAL SKETCHES:** This section must not exceed 2 pages per individual. For each of the personnel listed by name on the budget page and each person included on the list of faculty participants (section V.A.3.g), provide a Biographical Sketch highlighting information that will help in understanding the qualifications that this individual will bring to the GK-12 project. This Biographical Sketch should include information about recent training activities such as the number and names of graduate students who carried out STEM research under the faculty member's direction in each of the last three years. List the titles of courses taught by the faculty member during the past three years and include other relevant activities, such as organization of workshops or special courses. Include information related to activities conducted in collaboration with K-12 schools or other educational organizations. List current and past collaborators including those with whom the faculty member has co-authored papers within the past four years.

6. **CURRENT AND PENDING SUPPORT:** For each PI and Co-PI, you must indicate time commitments for all current and pending support from all agencies. This is not limited to NSF or other federal agency support.

7. **SUPPLEMENTARY DOCUMENTATION:** This section should not exceed 10 pages. It must include a statement from the institution of higher education and the superintendent(s) of the local K-12 school district(s) involved. The local superintendent(s) or chief school officer(s) who can represent the school district and honor its financial commitments must sign this statement. This statement should include some background about participating schools and demographics of the student population; specific STEM needs of participating schools or of the district in general; specific conditions in the K-12 schools in which fellows are expected to operate (e.g., availability of technology and/ or scientific materials); coordinated plans of the district to receive GK-12 fellows into its schools; financial commitments or other support to be provided for GK-12 teachers (e.g., release time, conference attendance, workshop participation, professional development units); and incentives, recognition and awards to be provided to GK-12 teachers for their participation in the GK-12 project.

B. Budgetary Information

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

Other Budgetary Limitations:

The costs of participants' (STEM graduate fellows, GK-12 teachers) travel, stipends, the costs of workshops, and the cost of education for fellows should be listed under Participant Support Costs. Separate the costs for fellows and GK-12 teachers in the Budget Justification. Also indicate the number of fellows and teachers anticipated. None of these costs should be included in the base used to calculate Indirect Costs.

Budget Preparation Instructions:

Provide a Summary Proposal Budget for each year of support requested. The maximum allowed for each year is $600,000, which includes both direct and indirect costs. FastLane will create the cumulative budget automatically. For proposals submitted via Grants.gov, please include a cumulative budget.

Recognizing the importance of infrastructure support and the significant involvement of faculty and GK-12 teachers, up to 30% of the budget may be designated for direct costs other than fellows' stipends, GK-12 Teacher stipends and cost-of-

education allowances. These funds are intended to supplement institutional and school district resources in support of GK-12 activities. The budget should plan for adequate funds to conduct the project evaluation (e.g., 5% of the total amount requested per year).

For projects that include an international component, a total of up to $100,000 for the duration of the project may be additionally requested for international activities and administrative support for participants from the United States (e.g., STEM graduate fellows and K-12 teachers). PIs should include a letter of support and a biographical sketch of the international partner.

Funds may be requested for personnel to develop and construct special instruments, for the purchase of software, or for other special-purpose materials related to the project for use by the STEM graduate fellows and K-12 teachers and students. Use of inquiry-based educational materials such as those developed under NSF support is encouraged. The total requested for software and special-purpose materials may not exceed $10,000 for the duration of the project.

Funds may be requested for professional development, training or workshop participation for GK-12 teachers. These expenses should be listed under Participant Support Costs.

Funds should be included for the PI and up to three participants to attend an annual meeting convened by NSF in the Washington, D.C. area. The participants should include at least one current GK-12 fellow and one current GK-12 teacher. Travel for PIs should be listed under Domestic Travel. Travel for fellows and teachers should be listed under Participant Support Costs.

Budget Justification: This section must not exceed 3 pages. A clear justification for funds in each budget category should be provided. List next to each item commented upon in the Budget Justification the corresponding letter and number of that item on the Budget Page.

C. Due Dates

- **Letter of Intent Due Date(s)** ***(required):***

  May 16, 2007

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

  July 02, 2007

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.

Additional Review Criteria:

In light of the GK-12 program's objectives, reviewers will be asked to consider the above two merit review criteria with emphasis placed on:

- Plans for incorporating fellows' research into the GK-12 project.
- Integration of the disciplinary, multidisciplinary, or interdisciplinary research theme(s) with the education activities of the fellows in K-12 schools as an intellectual focus for the project.
- Intellectual basis, quality and effectiveness of the planned education and training activities for fellows and GK-12 teachers to ensure professional development for both.
- Expected benefits to fellows, their institutions of higher education, K-12 students and their schools, and GK-12 teachers.
- Team composition and extent of collaboration between the proposing institution(s) of higher education and the participating K-12 school district(s).
- Effectiveness of the plans and procedures for the recruitment, selection, and mentoring of fellows and GK-12 teachers, including attention to diversity.
- Consistency of project designs with mathematics and science standards established by national organizations, states, and school districts.
- Potential of the project to incorporate GK-12 like activities as permanent features in the training of STEM graduate students.
- Plans for evaluation, assessment of project performance and dissemination of results.

Priority will be given to proposals from institutions that have not received a previous GK-12 award.

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 *Grant Policy Manual* (GPM) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpm.

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.

Additional reporting requirements apply. Please see the full text of this solicitation for further information.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Sonia Ortega, Program Director, Division of Graduate Education, Directorate for Education and Human Resources, 875 S, telephone: (703) 292-8697, fax: (703) 292-9048, email: sortega@nsf.gov
- Umesh Thakkar, Program Director, Division of Graduate Education, Directorate for Education and Human Resources, 875 S, telephone: (703) 292-8697, fax: (703) 292-9048, email: uthakkar@nsf.gov

For questions related to the use of FastLane, contact:

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

- Yvette D. Jackson, Information Technology Specialist, 875 S, telephone: (703) 292-4925, fax: (703) 292-9048, email: yjackson@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.

Members of the NSF wide GK-12 Committee represent their respective NSF organizations. They contribute funds as well as intellectual and labor capital to the program. In addition to the GK-12 staff, members of the GK-12 committee are:

- Henry N. Blount, Directorate for Mathematics and Physical Sciences
- Renee D. Crain, Office of Polar Programs
- James S. Dietz, Directorate for Education and Human Resources
- Roosevelt Y. Johnson, Directorate for Education and Human Resources
- Dana E. Lehr, Directorate for Mathematics and Physical Sciences
- Linda Lopez, Directorate for Social, Behavioral and Economic Sciences
- Julio E. Lopez-Ferrao, Experimental Program to Stimulate Competitive Research
- Tyrone D. Mitchell, Directorate for Mathematics and Physical Sciences
- Sally E. O'Connor, Directorate for Biological Sciences
- Celestine H. Pea, Directorate for Education and Human Resources
- Jennifer S. Pearl, Office of International Science and Engineering
- Mary F. Poats, Directorate for Engineering
- Joan T. Prival, Directorate for Education and Human Resources
- Diana R. Rhoten, Office of Cyberinfrastructure
- Elizabeth L. Rom, Directorate for Geosciences
- Maria Zemankova, Directorate for Computer and Information Sciences and Engineering

General inquiries regarding this program should be made to the GK-12 staff at gk-12@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.

Research and Evaluation on Education in Science and Engineering (REESE)

The Division of Graduate Education is calling your attention to the opportunity to request support for research and evaluation projects focused on graduate education. This opportunity is embedded in the Research and Evaluation on Education in Science and Engineering Program Solicitation, which can be viewed at: http://www.nsf.gov/pubs/2006/nsf06609/nsf06609.htm.

In addition to other important goals, REESE seeks to build a research community that can more effectively address current issues, trends and questions in STEM graduate education, such as:

- How to increase participation by students in STEM graduate education;
- Efforts to improve the retention and graduation rates of STEM graduate students;
- The impact of increased mentoring on the success of graduate students;
- Emerging STEM research fields, particularly cross-disciplinary ones;
- Changes in skills expected for STEM professionals and how these are communicated to graduate programs;
- The effects on graduate education of growing international cooperation in research and education;
- Uses of new technologies (including new cyberinfrastructure developments) in both education and research;
- The speed of diffusion of new methods of graduate education, or the diffusion of new programs in emerging STEM disciplines; and
- Advancing the understanding of the causes and effects of progress in and barriers to broadening participation in STEM graduate education.

REESE encourages both synthesis projects (e.g., workshops, exploratory research, planning and design projects) for durations of one to three years not to exceed $200,000 and larger empirical projects for durations of three to five years with project budgets up to $1 million. Proposers should review the REESE Program Solicitation to ensure that eligibility requirements are met. The Dear Colleague Letter for REESE may be viewed at: http://www.nsf.gov/pubs/2007/nsf07015/nsf07015.jsp.

Online Evaluation Resource Library (OERL)

The Online Evaluation Resource Library, funded by NSF, provides guidelines for how to improve evaluation practice using Web site resources. It provides a large collection of sound plans, reports and instruments from past and current project evaluations in several content areas.

OERL resources include instruments, plans, and reports from evaluations that have proven to be sound and representative of current evaluation practices. It also includes alignment tables that contain criteria and a glossary to help with the development of your own plans, reports and instruments.

PIs and GK-12 project evaluators are encouraged to consult OERL at: http://oerl.sri.com/.

Partnerships for International Research and Education (PIRE)

The Partnerships for International Research and Education program, which is managed by the Office of International Science and Engineering (OISE), enables U.S. institutions to establish collaborative relationships with international groups or institutions in order to engender new knowledge and discoveries at the frontier and to promote the development of a globally-engaged, U.S. scientific and engineering workforce. The PIRE Program Solicitation may be viewed at: http://www.nsf.gov/pubs/2006/nsf06589/nsf06589.htm.

Cyberinfrastructure Training, Education, Advancement, and Mentoring for Our 21st Century Workforce (CI-TEAM)

The Cyberinfrastructure Training, Education, Advancement, and Mentoring for Our 21st Century Workforce program is managed by the Office of Cyberinfrastructure (OCI). The Information technology (IT)-enabled systems, tools, and services have had profound impact on the practice of science and engineering research and education. Integrated to create a national cyberinfrastructure, these systems, tools and services are enabling individuals, groups and organizations to advance science and engineering in ways that revolutionize *who can participate, what they can do*, and *how they do it*. To harness the full power of cyberinfrastructure, and the promise it portends for discovery, learning and innovation across and within all areas of science and engineering, requires focused investments in the preparation of a science and engineering workforce with the knowledge and skills needed to create, advance and take advantage of cyberinfrastructure over the long-term. Further information about the CI-TEAM Program Solicitation may be obtained via the NSF OCI website (http://www.nsf.gov/dir/index.jsp?org=OCI).

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

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

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

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

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

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

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at http://www.nsf.gov

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230
- **For General Information** (NSF Information Center)**:** (703) 292-5111
- **TDD (for the hearing-impaired):** (703) 292-5090
- **To Order Publications or Forms:**

  Send an e-mail to: pubs@nsf.gov

  or telephone: (703) 292-7827
- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants

as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records, " 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0058. Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

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