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

National Science Foundation
Directorate for Education and Human Resources
  Division of Graduate Education

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

May 05, 2004
       By email to gk-12@nsf.gov by 5:00 PM proposer's local time

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

June 02, 2004

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

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

Synopsis of Program:

This program supports fellowships and associated training that enable graduate students and advanced undergraduates in science, technology, engineering, and mathematics to serve in K-12 schools as resources knowledgeable about both the content and applications of these disciplines. Academic institutions apply for awards to support fellowship activities. Institutions are responsible for: 1) selecting Fellows; 2) partnering with school districts for placement of Fellows in schools; 3) providing appropriate training for Fellows, and 4) designing and implementing an effective mechanism for documenting the outcomes of the project. The Fellows serve as resources for teachers in science and mathematics instruction. Expected outcomes include improved communication and teaching skills transferable to a variety of occupations, and enhanced ability to function within and capitalize on working partnerships and teams for the Fellows, enriched learning by K-12 students, professional development opportunities for GK-12 Teachers, and strong partnerships between institutions of higher education and local school districts. As an agency-wide activity the GK-12 program supports projects from the full spectrum of National Science Foundation (NSF)

disciplines including the social, behavioral and economic sciences, mathematical and physical sciences, biological sciences, engineering, computer and information science, and the geosciences. Awards are for initial projects of up to three years (Track 1, Initial Track) with the potential to apply for a follow-on project of up to five years (Track 2, Follow-on Track). Additional information concerning the program and presently funded projects can be found in the GK-12 website. http://www.ehr.nsf.gov/dge/programs/gk12/.

Cognizant Program Officer(s):

- Terry S. Woodin, Program Director, Directorate for Education & Human Resources, Division of Graduate Education, 907 N, telephone: (703) 292-8697, fax: (703) 292-9048, email: twoodin@nsf.gov
- Carolyn L. Piper, Assistant Program Director, Directorate for Education & Human Resources, Division of Graduate Education, 907 N, telephone: (703) 292-8697, fax: (703) 292-9048, email: cpiper@nsf.gov

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

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

Eligibility Information

- **Organization Limit:** Proposals may be submitted only by academic institutions in the United States and its territories that grant masters or doctoral degrees in STEM disciplines supported by the National Science Foundation (NSF)

- **PI Eligibility Limit:** The PI must be a faculty member in a discipline supported by NSF.
- **Limit on Number of Proposals:** One Per institution.

Award Information

- **Anticipated Type of Award:** Continuing Grant
- **Estimated Number of Awards:** 30 - total: includes 15 Track 1 awards (up to $660,000/yr. for a total award duration of up to three (3) years) and 15 Track 2 awards (up to $2 million total for an award duration of up to five (5) years with awards in any one year not to exceed $500,000)
- **Anticipated Funding Amount:** $17,200,000 approximately in FY 2005 (pending availability of funds.)

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 Proposal Preparation Instructions:** This solicitation contains information that deviates from the standard Grant Proposal Guide (GPG) proposal preparation guidelines. Please see the full text of this 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 text of this solicitation for further information.

C. Due Dates

- **Letters of Intent** *(required)*:
    May 05, 2004
            By email to gk-12@nsf.gov by 5:00 PM proposer's local time
- **Full Proposal Deadline Date(s)** (due by 5 p.m. proposer's local time):
    June 02, 2004

Proposal Review Information

- **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.

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I. INTRODUCTION

The National Science Foundation (NSF) Graduate Teaching Fellows in K-12 Education (GK-12) program recognizes that graduates of higher education programs in science, technology, engineering, and mathematics (STEM) can contribute to the national effort to address the challenging issues in K-12 education across a broad spectrum of schools and educational levels. In particular, STEM graduate students can partner with K-12 teachers to work towards improving the content of science and mathematics taught in their classes. While the focus of this initiative is on graduate students serving as resources for K-12 education, advanced undergraduate STEM majors may be included as appropriate to further the goals of individual projects. NSF anticipates that the GK-12 experience will benefit both the graduate and undergraduate Fellows in their chosen STEM professions as well as provide a basis for them to contribute toward the improvement of the nation's educational enterprise.

The purpose of GK-12 is to enable institutions to experiment with and then make a permanent part of their institutional graduate opportunities a program that features:

- opportunities for K-12 students to increase their STEM content knowledge and skills, and to work with STEM professional role models with whom they can relate;
- strong and enduring partnerships with schools and school systems;
- opportunities for STEM graduate students and upper division undergraduates to learn new teaching methods within their discipline and to improve their communication skills; and,
- opportunities for K-12 teachers to serve as mentors to STEM graduates and upper division undergraduates and, in the process, become more knowledgeable about STEM content and concepts and more confident in their skills within STEM.

The Foundation offers two tracks within the GK-12 program: Track 1 (Initial Track) for Principal Investigators in departments that have not previously been awarded a GK-12 project and Track 2 (Follow-on Track) for Principal Investigators in departments or institutions who currently or in the past have been awarded a GK-12 project and are now poised to sustain GK-12 activities as a permanent feature of their STEM graduate education programs and to disseminate models for the nation. Awards within each track are each one-time awards with no potential for renewals within that track. Approximately $17.2 million is expected to be available to support approximately 15 Track 1 awards and 15 Track 2 awards. Track 1 awards are expected to be in the range of $300,000 to $660,000 per year for up to three years. Track 2 awards are expected to be for a total of up to 5 years with decreasing amounts each year as the institutional support increases; the amount in any one year not to exceed $500,000 and a total for the award not to exceed $2 million.

Although there may be exceptions, based on the potential impact and quality of the proposal, it is anticipated that no more than one Track 2 award will be made to an institution. Track 1 is designed to provide an opportunity for institutions to develop an effective GK-12 model. Track 2 is designed for institutions to build on the initial GK-12 experiences, expand and improve these initial efforts, and establish the approaches developed through their GK-12 program as an integral part of their graduate program.

GK-12 is an NSF-wide activity. It is supported and managed by all NSF's Directorates, including the Directorates for Social and Behavioral and Economic Sciences, Computer and Information Science and Engineering, Biological Sciences, Education and Human Resources, Engineering, Geosciences, Mathematical and Physical Sciences, and the Office of Polar Programs. Additional information concerning the program and presently funded projects can be found in the GK-12 website. http://www.ehr.nsf.gov/dge/programs/gk12/.

II. PROGRAM DESCRIPTION

The GK-12 program provides universities an opportunity to experiment with and then make a permanent part of their institutional graduate opportunities a program that features outreach to K-12 schools in a manner that is of mutual benefit to their faculties and students.

Expected project outcomes include:

- improved communication and teaching-related skills for Fellows;
- incorporation of GK-12 like activities as an integral part of the institution's graduate programs in STEM;
- content gain and professional development opportunities for GK-12 Teachers;
- enriched learning by K-12 students;
- strengthened partnerships between higher education institutions and local school districts; and,
- documentation of project outcomes to provide a research base to inform development of GK-12 like activities and partnerships.

GK-12 Fellows, selected by awardee institutions, will work directly with GK-12 Teachers in and out of the classroom to, for example:

- connect K-12 learning to scientific methods needed for further study in STEM disciplines;
- provide role models for future STEM professionals;
- enhance GK-12 Teachers' content knowledge and understanding of principles of mathematics and the sciences; and
- jointly design and deliver K-12 science and mathematics instruction.

Principal Investigators (PIs), school representatives, GK-12 Teachers and STEM faculty must work together in the development of the GK-12 proposal. It is imperative that a partnership among all potential parties involved in the proposed project be developed early. For example, PIs and school representatives 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 schools and teachers.

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 GK-12 Fellows' activities with teachers and students will occur in K-12 schools. PIs are encouraged to establish collaborative arrangements with other institutions (e.g., two-and four-year institutions, industry, non-profit organizations, and museums) to support their activities.

III. ELIGIBILITY INFORMATION

A. 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. In any one competition, an institution may submit only one proposal, either as lead of a proposal from a single-institution or as a lead or partner institution of a multi-institutional proposal.

When multiple institutions are involved, a single institution must accept overall management responsibility.

Collaborating institutions may include two-and four-year colleges or non-academic institutions, industry, non-profit organizations, museums, etc.

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.

*An 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. Principal Investigator

The PI must be a faculty member in an NSF-supported discipline and should serve as the director of the GK-12 project. Faculty members involved in science or mathematics education departments or in the science of teaching and learning in any field are welcome to serve as Co-PIs. Staff from collaborating institutions (as described above) as well as K-12 school leaders may also serve as Co-PIs.

C. Fellows

GK-12 Fellows will be selected by awardee institutions, but must be:

- citizens, nationals**, or permanent residents of the United States at the time of application; and
- full time graduate students enrolled in STEM programs or full time advanced undergraduate STEM majors who have demonstrated a strong proficiency in mathematics and science.

** The term "national of the United States" designates a citizen of the United States or a native resident of the US possession such as American Samoa. Foreign students who hold student visas are not eligible.

D. GK-12 Teachers

GK-12 Teachers should have sufficient experience in pedagogy to help improve the communication and teaching-related skills of the GK-12 Fellows.

IV. AWARD INFORMATION

A. Number and Size of Awards

The number and size of awards will vary depending upon the scope of projects and availability of funds; however, it is anticipated that approximately 15 institutional awards in the range of $300,000 to $660,000 per year for up to three years will be made for Track 1 proposals, and 15 awards for a total of up to $2 million dollars each to support projects of up to five years in length, with awards not to exceed $500,000 for any one fiscal year, will be made for Track 2 proposals.

B. Stipends and Allowances

The stipend for a graduate student will be $30,000 for a 12-month tenure pending availability of funds. In addition, the awardee institution will be allowed a cost-of-education allowance of $10,500 per tenure year per graduate student in lieu of

tuition and fees normally charged to students of similar academic standing, unless such charges are optional or refundable.

The stipend for an undergraduate student will be $5,000 per academic year and $5,000 per summer.

All Fellows will spend a minimum of ten hours per week providing direct assistance to K-12 teachers and five hours of preparation outside of the classroom.

The stipends for GK-12 Teachers may support their professional contributions to various GK-12 planning and implementation activities. These activities may include 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. Funds for GK-12 Teacher compensation may be up to 15% of the funds allocated per year for a Fellow's stipend (i.e. 15% of $30,000 or $4,500 per year for GK-12 Teacher compensation).

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Letters of Intent *(required):*

Letters of Intent:

A letter of intent is required before submitting a full proposal and is intended to enhance the efficiency of the review process. The letter of intent is not a preliminary proposal. It is a brief statement that must address the following: 1) essential features of the project design; 2) principal investigator and list of faculty participants including their disciplines/departments and institutional affiliation; 3) K-12 school district participants and their affiliation; 4) disciplines to be covered by GK-12 Teachers and GK-12 Fellows; 5) Grade band: high school, middle school or elementary grades; and 6) Project setting: rural, urban, suburban. Letters of Intent should indicate whether they are Track 1 or Track 2 projects and must be sent by e-mail to gk-12@nsf.gov by May 5, 2004. For both Track 1 and Track 2, a Letter of Intent is required for all potential applicants including those who were declined in previous years and are interested in re-applying to the program.

Full Proposal Instructions:

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 Website 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 following instructions supplement the GPG guidelines:

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 are reminded to identify the program solicitation number stated at the beginning of this document in the program announcement/solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing. In the title section of the Cover Sheet, enter either "Track 1, GK-12" or "Track 2, GK-12" at the beginning of the proposal title, indicating the appropriate Track.

2. PROJECT SUMMARY: This section (limited to one single-spaced page, prepared in a standard font no smaller than 12 points) must be suitable for publication and should contain two sections, prepared as indicated below: a listing of project elements followed by a brief narrative summary of the project. **The narrative summary should explicitly indicate both the intellectual merits and broader implications of the project proposed. Proposals that fail to address both of these criteria in the summary will be returned unreviewed.** In addition, Track 2 proposals should specifically include a short summary of significant outcomes of their Track 1 project.

List of Project Elements

Title of Project:
Institution:
PI/Co-PI:
Number of Fellows per year (graduate vs. undergraduate):
Number of classes anticipated to be served/year:
Number of K-12 Teachers working with the Fellows:
School District Partners:
Target audience of the project (K-12 grade-band):
Setting: Urban, suburban or rural
NSF supported disciplines involved:

Narrative Summary: The brief description should be a concise self-contained summary of the project. It should clearly indicate the anticipated content focus or thematic approach and the nature of the activities planned for the K-12 classes participating, including how Fellow-teacher partnerships will be initiated and enhanced during the lifetime of the project, and should note innovative aspects of the project. Anticipated outcomes should be categorized as to intellectual merit and broader implications and should include benefits to be achieved by all participants in the enterprise, K-12 and higher education, the Fellows, Teachers and K-12 students. Mechanisms for determining outcomes, integrating GK-12 activities into graduate education programs and for establishing permanent university-K12 partnerships would enhance summaries of Track 1 projects and are an expected component of Track 2 summaries. If the proposal is funded, NSF staff will edit the project Summary, and it will be published along with abstracts of other awards.

3. PROJECT DESCRIPTION, including Results from Prior NSF Support: This section is limited to 15 single spaced pages including any visual materials and, if included within this section, support letters from superintendents of participating school districts. It must be prepared in standard font no smaller than 12 points. The Project Description should include the following subsections (a-h):

a. Results from Prior 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 co-PIs, PIs and/or partner organizations involved.

Track 1 proposals should briefly describe the earlier project(s) and their outcomes or ongoing progress. If appropriate indicate how these serve as a base for or will be incorporated into the proposed project.

Track 2 proposals should, in addition to describing earlier related projects, indicate specific illustrations of progress made and lessons learned during the current or recent GK-12 project(s) such as: the outcomes as regards Fellows, teachers and students; the nature of current partnerships (those with the schools are of particular importance); and a summary of the supporting infrastructure.

b. Goals and Objectives: Provide the conceptual focus, goals, and objectives of the project. Describe the activities that will form the foundation for the project.

c. Project Plan: It is important to indicate in this section not only what activities will be conducted but also

how they will be implemented. The project plan is expected to:

- indicate other active or recently completed GK-12 projects within the institution and indicate how this project will interact with, benefit by and be different from these other projects, with specific reference to such items as:
  - recruiting of Fellows,
  - interactions with local school districts as regards recruiting of teachers and coordination of assignment of Fellows to schools and classes,
  - coordination of infrastructure framework as regards evaluation, seminars and introductory workshops for Fellows and teachers, dissemination of results, and plans to incorporate GK-12 like activities as an integral part of STEM graduate education, and
  - disciplines addressed or mechanisms of operation;
- clearly state what the Fellows will be doing;
- demonstrate a clear parallel partnership and active participation by the institution(s) of higher education, GK-12 Fellows, local K-12 school district(s), GK-12 Teachers, and any participating community organizations;
- incorporate training activities for GK-12 Fellows based on a disciplinary or multidisciplinary theme, integrating established mathematics and science standards;
- incorporate professional development activities for GK-12 Teachers;
- outline plans to prepare GK-12 Fellows to serve as resources to GK-12 Teachers;
- clarify in sufficient detail the benefit to GK-12 Fellows, GK-12 Teachers and K-12 schools in supporting this type of project;
- indicate any relevant history of the higher education institution(s) in K-12 activities;
- indicate how K-12 activities planned by participating institution(s) of higher education will be aligned with educational needs of K-12 schools;
- describe implementation plans involving special populations in K-12 schools (e.g. underrepresented minorities, students at risk, with disabilities, with English as second language, etc.); and
- incorporate a detailed plan indicating how the GK-12 Fellows will enhance K-12 STEM instruction in the specific school districts, including, as appropriate, their role in implementing inquiry-based instructional strategies and materials.

Additional Elements for Track 2 Proposals:

- Indicate how participating Fellows, teachers and schools will be followed longitudinally to determine outcomes such as those listed below and such other characteristics as you deem important to determine the effectiveness of the GK-12 approach.
  - For the Fellows: length of time to degree compared to comparable students, career choices, outreach efforts, teaching practices adapted, and (for the undergraduate fellows) subsequent enrollment in graduate programs;

For the teachers: expertise in science and mathematics, teaching methods adapted, participation in professional development activities in STEM;

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For the schools: number of schools or teachers requesting GK-12 partnerships, changes in student STEM interest and competence level;

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For the university: number of faculty and students participating in GK-12 activities, changes in faculty and/or department support and practices as concerns GK-12 activities, overall impact on the institution.

- Indicate how you plan to determine characteristics of the project that: contribute to implementation of GK-12 activities as an element of the institution's graduate education program; lead to establishing K12-university partnerships; and serve as a mechanism to advance STEM education.

d. Recruitment and Selection: Describe plans and procedures for the recruitment and selection of GK-12 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. Also describe plans for the recruitment and selection of GK-12 Teachers.

e. Organization and Management: The Principal Investigator (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. This section is expected to:

- describe plans and procedures for the development of a management team for the proposed activity indicating how the responsibilities among team members will be allocated;

- indicate the number of GK-12 Fellows expected to be available to any given K-12 school district;

- describe the partnership's plans for integrating GK-12 Fellows into the schools and classes as STEM resources in support of GK-12 Teachers;

- include assurances from the institution of higher education that the NSF funds will not supplant extant financial resources assigned to science and mathematics education with similar assurances from the school district in the statement from the superintendent of the K-12 district described below;

- describe how the activities will be sustained after the period of NSF funding; and

- clearly indicate the specific schools where the GK-12 Fellows are expected to conduct their activities.

Track 2 proposals should, in addition, include information describing the infrastructure already developed to support their GK-12 project, any plans for changing it, the reasons for the planned changes, and the partnership's plans for maintaining this infrastructure once the partnership has become self-sustaining.

f. Evaluation: Describe an evaluation plan, including the performance indicators and other specific measures that will be used to assess the project's success in meeting its goals and objectives. Although each project should propose its own measures, some later standardization is anticipated so that NSF can conduct a program-wide evaluation of effectiveness. This section is expected to:

- provide the basic data related to the operation of the proposed plan including number of GK-12 Fellows and GK-12 Teachers involved including the number of underrepresented minorities participating;

-

indicate how the effectiveness of the training of GK-12 Fellows will be measured and how the impact of the program on the school districts and on the institutions will be evaluated;

- indicate how the effects of the program on participants (Fellows and the university, teachers and schools) will be determined;

- indicate plans for evaluation of the efficacy of project activities, including the development of a process for collecting and interpreting evaluative data and attributing impacts; and

- include timetables and metrics for accomplishments and indicate who will be responsible for monitoring and evaluating the progress of this effort.

Project participants (PIs, Fellow and GK-12 Teachers) should be prepared to submit Annual Reports via FastLane, to add information annually to a web based GK-12 specific data collection system and to cooperate in an overall program evaluation to be conducted by the NSF.

g. List of Faculty Participants: Include departmental and, if appropriate, institutional affiliation of all faculty participants expected to mentor GK-12 Fellows or to otherwise play an important role in the project.

h. School District Involvement: Include a brief summary of school district participation and a list of participating school districts. 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 or may be included within this section. 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 student population;
- specific STEM needs of participating schools or of the district in general;
- specific conditions in the K-12 schools under 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

4. REFERENCES CITED (see GPG, Chapter II Section C.4): 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 (see GPG, Chapter II, Section C.5): 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 (Item 3g), 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. This should include the number and names of undergraduates and graduate students who carried out research under the faculty member's direction in each of the last three years. Also list the titles of courses taught by the faculty member during the past three years. Other relevant activities, such as organization of workshops or special courses, may be included.

- Information related to activities conducted in collaboration with K-12 schools or other educational organizations.

- A list of 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 (see GPG Chapter II Section C.7): 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 superintendent(s) of the local K-12 school district(s) involved if such statement is not already included within the Program Description section. See the Project Description, Section V. A 3.h. for guidelines.

Proposers are reminded to identify the program announcement/solicitation number (04-533) in the program announcement/ solicitation block on the proposal Cover Sheet. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

B. Budgetary Information

Cost Sharing:

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

Other Budgetary Limitations:

The costs of participant (Fellows, teachers) travel, the costs of workshops, and the cost of education for Graduate Fellows should be listed under Participant Support Costs (Section F), as should the stipends for Fellows and teachers. If there are compelling reasons for listing these costs elsewhere in the budget, these reasons must be stated in the Budget Justification. 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. FastLane will create the cumulative budget automatically.

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 student 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.

Funds may be requested for personnel to develop and construct special instruments, for the purchase of computer software, or for other special-purpose materials related to the project. 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.

Funds may be requested for professional development, training or workshop participation for GK-12 Teachers.

Funds should be included for the PI and up to three participants to attend an annual meeting convened by NSF in Washington, D.C. The participants should include at least one GK-12 Fellow and one GK-12 Teacher.

Budget Justification: This section must not exceed 3 pages. A brief 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

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

Letters of Intent *(required):*

> May 05, 2004
>> By email to gk-12@nsf.gov by 5:00 PM proposer's local time

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

> June 02, 2004

D. FastLane Requirements

Proposers are required to prepare and submit all proposals for this announcement/solicitation 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 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 announcement/solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this announcement/solicitation.

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. Proposers are no longer required to provide a paper copy of the signed Proposal Cover Sheet to NSF. 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.

The National Science Board approved revised criteria for evaluating proposals at its meeting on March 28, 1997 (NSB 97-72). All NSF proposals are evaluated through use of the two merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

On July 8, 2002, the NSF Director issued Important Notice 127, Implementation of new Grant Proposal Guide Requirements Related to the Broader Impacts Criterion. This Important Notice reinforces the importance of addressing both criteria in the preparation and review of all proposals submitted to NSF. NSF continues to strengthen its internal processes to ensure that both of the merit review criteria are addressed when making funding decisions.

In an effort to increase compliance with these requirements, the January 2002 issuance of the GPG incorporated revised proposal preparation guidelines relating to the development of the Project Summary and Project Description. Chapter II of the GPG specifies that Principal Investigators (PIs) must address both merit review criteria in separate statements within the one-page Project Summary. This chapter also reiterates that broader impacts resulting from the proposed project must be addressed in the Project Description and described as an integral part of the narrative.

Effective October 1, 2002, NSF will return without review proposals that do not separately address both merit review criteria within the Project Summary. It is believed that these changes to NSF proposal preparation and processing guidelines will more clearly articulate the importance of broader impacts to NSF-funded projects.

The two National Science Board approved merit review criteria are listed below (see the Grant Proposal Guide Chapter III.A for further information). 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 he/she is qualified to make judgments.

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:

For Track 1 and 2 proposals:

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:

1. Expected benefits to Fellows, their institutions of higher education, K-12 schools, and GK-12 Teachers.
2. Team composition and extent of collaboration between the proposing institution(s) of higher education and the participating K-12 school district(s).
3. Effectiveness of the plans and procedures for the recruitment and selection of GK-12 Fellows and GK-12 Teachers, including attention to diversity
4. Quality of the planned education and training activities for GK-12 Fellows and GK-12 Teachers.
5. Consistency of project designs with mathematics and science standards established by national organizations, states, and school districts.
6. Importance of the disciplinary activity theme, including its effectiveness as an intellectual focus for the project.
7. Excellence of the proposed outreach activity as reflected in the major outreach efforts.
8. Appropriateness of the administrative plan and organization structure in assuring fair and effective allocation of group resources.
9. Appropriateness of the plans for evaluation of project performance, including longitudinal and process data.
10. Appropriateness of the budget.
11. Sustainability of the project activities beyond the period of NSF funding.

Priority will be given to Track 1 proposals from institutions that have not received a previous GK-12 award.

Additional criteria for Track 2 include:

- The quality and outcomes of the previous GK-12 project(s).
- The potential for recovering significant data from longitudinal studies that will provide insight into the benefits of GK-12 activities to Fellows and universities, and to teachers, schools and K-12 students.
- The likelihood that a practical plan will evolve for incorporating GK-12 opportunities into the institution's STEM graduate education, including the strength of the supporting infrastructure.

For consideration during any one competition, reviewers will have available to them abstracts from all previous GK-12 projects awarded to institutions submitting proposals to that competition.

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.

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 Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

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.

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 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 Website 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 Website 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 Website 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.

In addition to submitting Annual Reports via FASTLANE, PIs and Project participants should be prepared to cooperate in an overall program evaluation to be conducted by the NSF and to provide information annually to a web based GK-12 specific data collection system (See Section V Proposal Preparation and Submission Instructions; A. Proposal Preparation Instructions, Full Proposal Instructions; Subsection 3 Project Description; Subdivision f. Evaluation)

Within 90 days after the expiration of an award, the PI also is required to submit a final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for the PI and all Co-PIs. 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. 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 this program should be made to:

- Terry S. Woodin, Program Director, Directorate for Education & Human Resources, Division of Graduate Education, 907 N, telephone: (703) 292-8697, fax: (703) 292-9048, email: twoodin@nsf.gov
- Carolyn L. Piper, Assistant Program Director, Directorate for Education & Human Resources, Division of Graduate Education, 907 N, telephone: (703) 292-8697, fax: (703) 292-9048, email: cpiper@nsf.gov

For questions related to the use of FastLane, contact:

- Sheryl T. Balke, Directorate for Education & Human Resources, Division of Graduate Education, 907 N, telephone: (703) 292-8630, fax: (703) 292-9048, email: sbalke@nsf.gov
- FastLane Help Desk, telephone: 1-800-873-6188, email: fastlane@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 Website 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.

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, although some programs may have special requirements that limit eligibility.

Facilitation Awards for Scientists and Engineers with Disabilities (FASED) 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 GPG Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

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**   (703) 292-5111
  (NSF Information Center)**:**

- **TDD (for the hearing-impaired):**   (703) 292-5090 or (800) 281-8749

- **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

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