Research Experiences for Teachers (RET) in Engineering
Supplements and Sites

Program Solicitation
NSF 07-557

Replaces Document(s):
NSF 03-554

National Science Foundation

Directorate for Engineering
    Engineering Education and Centers

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

July 06, 2007

November 19, 2007

Third Monday in November, Annually Thereafter

REVISION NOTES

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

In response to this program solicitation, proposers may opt to submit proposals via Grants.gov or via the NSF FastLane system. In determining which method to utilize in the electronic preparation and submission of the proposal, please note the following:

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

Proposals submitted to the RET Site competition must be submitted by a principal investigator holding a faculty appointment in a College/Department of Engineering, or a College/Department of Engineering Technology within a U.S. academic institution. Collaboration as appropriate with individual investigators or groups from other Colleges/Departments with undergraduate programs in disciplines usually supported by NSF, in a non-lead role are permitted.

RET Site proposals submitted by principal investigators holding a faculty appointment in Colleges/Departments other than Engineering or Engineering Technology will be returned without review.

The minimum number of weeks teachers and community college faculty must be involved in an RET Site program during the summer is six. Exceptions to this minimum time limit will be considered with appropriate justification.

A substantive plan for follow-up with the teachers and community college faculty during the academic year must be provided in the RET Site proposal.

Participating teachers and community college faculty must have a background in engineering, science, or mathematics to be eligible to participate in this program.

The total amount of funding available for an RET Site program has been increased to a total of $500,000 for three years.

The RET program encourages PIs to involve teachers in international research experiences in their proposals. 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 managers(s) are available from the OISE Home Page, http://www.nsf.gov/od/oise/country-list.jsp.)

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Research Experiences for Teachers (RET) in Engineering
Supplements and Sites

Synopsis of Program:

The Directorate for Engineering (ENG), Research Experiences for Teachers (RET) in Engineering program supports the active involvement of K-12 teachers and community college faculty in engineering research in order to bring knowledge of engineering and technological innovation into their classrooms. The goal is to help build long-term collaborative partnerships between K-12 science, technology, engineering, and mathematics (STEM) teachers, community college faculty, and the NSF university research community by involving the teachers in engineering research and helping them translate their research experiences and new knowledge of engineering into classroom activities. Partnerships with inner city schools or other high need schools are especially encouraged, as is participation by underrepresented minorities, women, and persons with disabilities. This announcement features two mechanisms for support of in-service and pre-service K-12 teachers and/or community college faculty: RET supplements to ongoing ENG awards and new RET Site awards. RET supplements may be included in proposals for new or renewed NSF Directorate for Engineering (ENG) grants or as supplements to ongoing NSF ENG funded projects. RET Sites are based on independent proposals from engineering departments, schools or colleges to initiate and conduct research participation projects for a number of K-12 teachers and/or community college faculty.

Cognizant Program Officer(s):

- Mary Poats, ENG/RET Program Manager, Directorate for Engineering, Division of Engineering Education and Centers, 585 N, telephone: (703) 292-5357, fax: (703) 292-9051, email: mpoats@nsf.gov

- Radhakishan Baheti, Program Director, Directorate for Engineering, Division of Electrical, Communications and Cyber Systems, 675 S, telephone: (703) 292-8339, fax: (703) 292-9147, email: rbaheti@nsf.gov

- Cynthia Ekstein, Program Director, Directorate for Engineering, Division of Chemical, Bioengineering, Environmental, and Transport Systems, 565 S, telephone: (703) 292-7941, fax: (703) 292-9098, email: cekstein@nsf.gov

- Richard Fragaszy, Program Director, Directorate for Engineering, Division of Civil, Mechanical and Manufacturing Innovation, 545 S, telephone: (703) 292-8360, email: rfragasz@nsf.gov

- Sandra Loving, Program and Managment Analyst, Directorate for Engineering, Division of Industrial Innovation and Partnerships, 590, telephone: (703) 292-7084, email: sloving@nsf.gov

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

- 47.041 --- Engineering

Award Information

Anticipated Type of Award: Standard Grant or Continuing Grant

Estimated Number of Awards: 5

Anticipated Funding Amount: $500,000 maximum total for a duration of up to three years for RET Site Awards subject to the availability of funds. RET supplements are limited to a maximum of $10,000 per teacher for a duration of one year subject to the availability of funds.

Eligibility Information

Organization Limit:

Proposals may only be submitted by the following:

- Universities and colleges: U.S. universities and two- and four-year colleges (including community colleges) located and accredited in the U.S. Such organizations also are referred to as academic institutions.

PI Limit:

The principal investigator of an ENG RET Site proposal must have a faculty appointment within a College/ Department of Engineering or a College/Department of Engineering Technology within the submitting U.S. academic institution.

Limit on Number of Proposals per Organization: 2

Two proposals may be submitted by a U.S. academic institution, College/Department of Engineering or College/Department of Engineering Technology as the lead institution.

Limit on Number of Proposals per PI: 1

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not Applicable

- **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:** An administrative allowance, limited to 25 percent of the participant support stipend amount only (Line F.1. on the FastLane budget and Field E.2. on the Grants.gov budget), is allowed for RET

Supplement and Site awards in lieu of indirect costs.

- **Other Budgetary Limitations:** Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

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

    July 06, 2007

    November 19, 2007

    Third Monday in November, Annually Thereafter

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: Standard NSF reporting requirements apply

TABLE OF CONTENTS

I. INTRODUCTION

Encouraging active participation of K-12 teachers and community college faculty in NSF supported projects is an excellent way to reach broadly into the teacher talent pool of the U.S. so that they can teach engineering concepts to K-12 students to encourage and stimulate them to pursue engineering careers. The Research Experiences for Teachers (RET) in Engineering activity was initiated in the NSF Directorate for Engineering in FY 2001 to involve middle and high school teachers in engineering research in order to bring knowledge of engineering and technological innovation to the pre-college classroom. This is achieved by building partnerships between teachers and engineering researchers in engineering research laboratories through site awards and supplements to on-going research and education projects funded by ENG. Through these partnerships, the RET Program aims to:

- build long-term collaborative relationships between both in-service and pre-service K-12 teachers, community college faculty, and the engineering research community;
- support the active participation of these teachers and future teachers and community college faculty in research and education projects funded by NSF ENG;
- facilitate professional development of K-12 teachers and community college faculty through strengthened partnerships between institutions of higher education and local school districts; and
- encourage researchers to build mutually rewarding partnerships with teachers and community college faculty.

II. PROGRAM DESCRIPTION

The RET program encourages the active participation of both in-service and pre-service (education majors who are still pursuing their degrees) K-12 teachers and community college faculty in ongoing NSF supported engineering research through supplements and sites. Encouraging active participation of teachers in NSF projects is an excellent way to reach broadly into the teacher talent pool of the U.S. so that they can teach engineering concepts to K-12 students to encourage and stimulate them to pursue engineering careers.

ENG strongly encourages all of its grantees, including grantees from the Small Business Innovation Research (SBIR) and the Small Business Technology Research (STTR) programs, to make special efforts to identify talented teachers for participation in this RET opportunity.

ENG strongly encourages the use of RET supplements and sites to enable K-12 teachers of science, mathematics, and engineering and community college faculty to participate in Research Experiences for Undergraduates (REU) programs.

The RET program will allow PIs to involve teachers in international research experiences in their proposals. 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 managers(s) are available from the OISE Home Page, http://www.nsf.gov/index.jsp?div=OISE.)

RET Supplement. A request for funding of an RET supplement should be made under an existing NSF ENG award or within a proposal for a new or renewed NSF ENG award. The description of the RET activity must clearly articulate in some detail the form and nature of the prospective K-12 teacher and if desired community college faculty member's involvement in the Principal Investigator's ongoing or proposed research. See V.A.(5), "Project Description," below for detailed information. For example, the teacher or community college faculty member may participate in the design of new experiments, modeling and analysis of experimental data, algorithm and software development, and other activities that will result in intellectual contributions to the project. It is expected that the RET supplement experience will also lead to the transfer of new knowledge to classroom activities. Therefore, the RET supplement description must also indicate what type of sustained follow-up will be provided during the academic year to help in translating the teacher's research experience and new understanding of engineering concepts into classroom practice.

RET Site. An RET Site project is an independent proposal, submitted at an annual deadline date, to provide groups of in-service and pre-service K-12 teachers and if desired, community college faculty with discovery-based learning experiences in engineering laboratories and facilities, which will then be incorporated into their classroom activities during the school year. An RET Site project may be conducted during the summer, academic year, or both, and must have a well-defined focus, with clearly articulated projects and activities for teachers or community college faculty. An RET Site proposal must be submitted by a College, School, or Department of Engineering and must involve teachers and/or community college faculty in an engineering research project for a duration of at least six weeks. In those cases where limited availability of specialized facilities, such as clean rooms, electron microscope, etc., make it possible to offer an extraordinary experience in a shorter

timeframe, a research component of a shorter duration may be proposed with appropriate justification. An orientation session must be included at the beginning of the program for the teachers or community college faculty to acquaint them with laboratory methods, safety procedures, analytical methods, etc. as appropriate to the proposal. Because the RET experience also will lead to the transfer of new knowledge to classroom activities, the proposal must provide a plan for sustained follow-up by the RET site project team with the teachers to ensure that the research experience is translated into classroom practice during the academic year. The proposal must also provide a detailed plan for evaluation of the proposed project and the classroom impact. The site proposal may also include a request for support of a workshop designed to reach teachers and community college faculty not involved in an RET site project to inform them of the outcomes and materials developed as a result of the site project.

III. AWARD INFORMATION

The estimated RET Program budget for each fiscal year is $3,000,000 which includes funding for both sites and supplements. The total number of site awards anticipated per year is five. The anticipated maximum funding amount per site is $500,000 for a duration of up to three years subject to the availability of funds. RET supplements are limited to a maximum of $10,000 per teacher for a duration of one year subject to the availability of funds.

IV. ELIGIBILITY INFORMATION

Organization Limit:

Proposals may only be submitted by the following:

- Universities and colleges: U.S. universities and two- and four-year colleges (including community colleges) located and accredited in the U.S. Such organizations also are referred to as academic institutions.

PI Limit:

The principal investigator of an ENG RET Site proposal must have a faculty appointment within a College/ Department of Engineering or a College/Department of Engineering Technology within the submitting U.S. academic institution.

Limit on Number of Proposals per Organization: 2

Two proposals may be submitted by a U.S. academic institution, College/Department of Engineering or College/Department of Engineering Technology as the lead institution.

Limit on Number of Proposals per PI: 1

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

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

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

Science Foundation. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (http://www.nsf.gov/bfa/dias/policy/docs/grantsgovguide.pdf). To obtain copies of the Application Guide and Application Forms Package, click on the Apply tab on the Grants.gov site, then click on the Apply Step 1: Download a Grant Application Package and Application Instructions link and enter the funding opportunity number, (the program solicitation number without the NSF prefix) and press the Download Package button. Paper copies of the Grants.gov Application Guide also may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from pubs@nsf.gov.

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

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

Proposal for RET Site

1. **Cover Sheet.** FastLane Users: Select the number for the RET program solicitation from the pull-down list. Grants.gov Users: The program solicitation number will be pre-populated by Grants.gov on the NSF Grants.gov Application Cover Page. The NSF organizational unit to which proposals should be directed is EEC - Research Experiences for Teachers (RET) in Engineering. In the title of the project, include the label "RET Site."

2. **Information about Principal Investigators.** A single individual should be designated clearly as principal investigator. This individual will be responsible for overseeing all aspects of the RET Site award. However, the institution may designate one additional person as co-principal investigator, should developing and operating the RET Site involve such shared responsibility. Other anticipated research supervisors or mentors are listed as senior personnel.

3. **Project Summary** (one-page limit). Must clearly address in separate statements (within the one-page summary): (1) the intellectual merit of the proposed activity; and (2) the broader impacts resulting from the proposed activity. (See Section VI.A for further descriptive information on the NSF merit review criteria.)

   In addition, provide a description of the activities that would result if the project is funded, including comments on its objectives, teachers or community college faculty to be accepted, intended impact on participating teachers or community college faculty and their students, and academic year follow-up. The project summary should include the following information: name of the host institution/organization, school districts and other institutions involved; the major field and subfields that describe the proposal area; a project title that will permit a prospective participant to identify the focus of the site (the title will be used in web-based lists of RET sites); number of teachers or community college faculty involved; number of summer weeks on site and academic year activity; name, telephone number, and email address of the point-of-contact for teacher or community college faculty recruitment; and a web address for site information (if known).

4. **Table of Contents.** The Table of Contents is system-generated and cannot be edited.

5. **Project Description.** The project description contains the following items "a" through "g" and is not to exceed 15 pages in length.

   a. Overview. Provide a brief description of the objectives of the proposed RET Site, targeted teacher or community college faculty participants, intellectual focus, broader impact of the proposed activity, organizational structure, timetable, and institutional commitment to the RET activity.

   b. Nature of Teacher or Community College Faculty Activities. Proposals must address the approach to research training being undertaken, and must provide detailed descriptions of examples of research projects that the teachers/community college faculty will pursue. These research projects must be relevant to the subjects taught by the participating teachers during the academic year. Proposals must present plans that will ensure the development of RET participant-faculty interaction and communication. Development of collegial relationships and interactions is an important part of the project opportunity therefore the teachers

and community college faculty should work closely in teams with university faculty and students.

c. The Research Environment. This subsection should describe the experience and record of involvement with K-12/community college education and research of the principal investigator, the faculty who may serve as research mentors, and the institution. This should include information on the record of faculty/mentors in publishing work and providing professional development opportunities for K-12 teachers or community college faculty. The facilities, equipment, and other resources available to support the proposed research experiences should be described in relation to those activities. The NSF form on facilities, equipment, and other resources is not required; rather, such information should be included in this section.

d. Participant Recruitment and Selection. The overall quality of the participant recruitment and selection processes and criteria will be an important element in proposal evaluation. The recruitment plan should be described with as much specificity as possible, including the types and/or names of institutions where participants will be recruited and the efforts to be made to attract members of underrepresented groups (women, minorities, and persons with disabilities) It is mandatory that at least two teachers or community college faculty be recruited for the program from the same K-12 school/community college in order to help ensure that outcomes of the program are more effectively disseminated to the participating institutions. RET Site participants must be currently teaching a STEM subject at their institution in order to participate in this program. It is also strongly encouraged that participants be allowed to participate in the RET Site program for two consecutive years.

e. Follow-up Plan. A major goal of the RET program is to help encourage and develop long-term relationships between the teacher and community college faculty participants, the RET Site project faculty team and the participating school districts particularly during the academic year. Therefore, a plan involving ongoing interaction that supports classroom implementation of lesson plans, curricula, or skills developed in the RET project must be included in the proposal. In addition, plans to hold a workshop to disseminate RET program experiences to a broader group of teachers and community college faculty not involved in the RET site program may be included in the proposal.

    If a request is being made for renewal support of a previously funded ENG RET Site, documentation must be provided on follow-up activities conducted during the prior RET project.

f. Project Evaluation and Reporting. This subsection should provide a plan for evaluation of the proposed project. The objective of the evaluation process is to measure qualitatively and quantitatively the success of the project in achieving its goals, particularly the degree to which the participants have learned and their perspectives on science or engineering have been expanded, as well as the impact on K-12 students and their curricular. The evaluation plan is an important part of the RET Site proposal, but proposers have much latitude in designing a plan that best suits their particular project. Although not required, RET Site project directors may wish to engage educational research specialists from their or another institution in planning and implementing the project evaluation. Evaluation may involve periodic measures throughout the project to ensure that it is progressing satisfactorily according to the project plan, and may involve pre-project and post-project measures aimed at determining the degree of teacher and student learning that has been achieved as a result of the project. Additionally, it is highly desirable to have a structured means of tracking participants with the aim of gauging the degree to which the RET Site experience has been a lasting influence as they follow their career paths.

    Annual progress reports are required through the FastLane project reports system. The progress report calls for information on project participants, on the research training provided and other educational activities, on publications and products, and most importantly on contributions to education and human resource development. Data for the progress report should feed into the project evaluation plan which in turn should enable informed statements about contributions and success in meeting project goals.

g. Results from Prior Support (if applicable). If no prior support has been received through an RET Site award, the maximum of 15 pages may be employed for items "a" through "f" above. If the applicant institution has received prior support through an RET Site award in the disciplinary area(s) of the proposal, the proposal must include a section (limited in length to five pages) entitled Results from Prior NSF Support within the 15-page narrative description of the project. This section must describe the earlier RET project(s) and outcomes (s) in sufficient detail to permit reviewers to reach an informed conclusion regarding the value of the results achieved. This will likely include results from the project evaluation, summary information on recruiting efforts and number of applicants, demographic make-up of participants and their home institutions, and career choices of participants; and a list of publications or reports (if to be submitted for publication) resulting from the NSF award.

6. **References Cited.** A listing of references to pertinent literature is optional.

7. **Current and Pending Support.** This form should be provided for all persons listed as senior personnel (up to a total of 12 people).

8. **Biographical Sketches.** The basic guidelines for biographical material apply; however, senior personnel are encouraged to include activities or accomplishments relevant to a successful RET Site. Senior personnel are the principal investigator; the co-principal investigator if one has been designated; and other faculty/professionals who are anticipated to serve as research mentors. The number of biographical sketches is limited to 12.

9. **Project Budget.** The proposal should include a detailed project budget and budget justification, as described in the GPG or NSF Grants.gov Application Guide. The budget justification (not to exceed three pages) should explain and justify major cost items and any unusual situations/inclusions and address the cost-effectiveness of the project. Project costs may include such items as faculty salaries and participant stipends, housing meals, travel, tuition, or laboratory use. A site may not charge the participant an application fee. Proposers are urged to consult the RET program manager concerning any questions about the project budget.

    The duration of an RET Site grant may be for up to three years, and the program may be carried out during summer months, academic year, or both. The total cost per teacher is limited to $10,000, which includes funds for the teacher's stipend and up to $2,000 for the cost of materials, equipment, software, and other supplies for developing classroom instructions and experiments. The total amount which may be requested for an RET Site may not exceed $500,000 with a program duration of up to three years. An administrative allowance (limited to 25 percent of the teacher's stipend only) is allowed in lieu of indirect costs. It is expected that teacher or community college faculty stipends will be adjusted according to their length of residency and that stipends for in-service teachers will generally be higher than those for pre-service teachers (education majors who are still pursuing their degrees).

    If funds are requested to conduct a workshop please add them into the yearly proposal budget and fully itemize and describe the funds requested in the budget justification.

10. **Supplementary Documentation.** The following two additional items may be provided.

    Optional Ethics Component (limit, three pages). Project directors may apply for support of ethics in science and engineering activities in an RET Site project. The proposal for an ethics component, entered as supplementary documentation, should describe the following: 1) ethics issues or topics that relate to the scientific/engineering content of the project and/or to issues of professional conduct of research; 2) participating faculty and other individuals with appropriate credentials in ethics, including outside ethicists as necessary; 3) activities that show how participants and RET mentors will be engaged in ethics discussions designed to present ethics concepts and skills for resolution of ethical issues, using approaches such as seminars, student presentations and reports, role-playing, case studies, and outside speaker presentations; 4) products such as reports, presentations, and web-based materials; 5) a formative evaluation plan to be used to improve the component; and 6) results from any prior support for an ethics component.

    Project directors may apply for up to $4,000 each year in support of ethics activities in an RET Site project. These funds are not included in the guideline of $10,000 per teacher or community college faculty. Up to 25 percent of the direct costs requested for this component may be budgeted as an administrative allowance, but the yearly total requested for ethics activities may not exceed $4,000. A separate budget sheet is not possible in FastLane or Grants.gov. Thus, the ethics budget is added into the yearly proposal budget; but **must be itemized in the budget justification, with a total shown for the items plus administrative allowance.** Questions regarding the ethics component should be directed to the Program Director for Ethics and Values Studies at 703-292-7279.

    Letters of Commitment. Signed letters of commitment documenting collaborative arrangements of significance to the proposal should be scanned and placed in this section. Letters of support and commitment from participating school districts are required. Letters may be relevant where the awardee and performing organizations are different, where faculty or facilities of more than one institution are to be employed, or where international activities are arranged. Letters of endorsement are not permitted.

RET Supplement Proposal Instructions:

Proposals for RET Supplements should be prepared and submitted in accordance with the general guidelines contained in the NSF *Grant Proposal Guide (GPG)* and must be submitted via FastLane. *S*ee URL: http://www.nsf.gov/pubs/2003/

nsf032/032_5.htm#VB4. 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 (301) 947-2722 or by e-mail from pubs@nsf.gov.

Request for RET Supplement

RET Supplements are supported by the various disciplinary research programs within the Directorate for Engineering. An RET supplement request may be included in a proposal for a new or renewed ENG grant or cooperative agreement submitted later as a supplement to an ongoing award. Guidance for use of either mechanism is given below. In either case, the description of the RET activity should clearly articulate in some detail the form and nature of the prospective teacher or community college faculty's involvement in the principal investigator's ongoing or proposed research. For example, the teacher or community college faculty member may participate in the design of new experiments, modeling and analysis of experimental data, algorithm and software development, and other activities that will result in intellectual contributions to the project. It is expected that the RET supplement experience will also lead to the transfer of new knowledge to classroom activities. Therefore, the RET supplement description should also indicate what type of sustained follow-up will be provided to help in translating the teacher's research experience into classroom practice. The request should also discuss the experience of the principal investigator (or other possible research mentors) in involving K-12 teachers and community college faculty in research, including any previous RET supplement support and the outcomes from that support; and the process and criteria for selection of the teachers or faculty. A brief biographical sketch of the teacher or community college faculty should also be included, if available.

The duration of the RET supplement will be one year and the project may be carried out during summer months, academic year, or both. The total cost of the supplement is limited to $10,000 per teacher. The budget includes a teacher's stipend and up to $1,000 for the cost of materials, equipment, software and other supplies for developing classroom instructions and experiments. An administrative allowance (limited to 25 percent of the teacher's stipend only and included in the $10,000 total) is allowed in lieu of indirect costs.

Normally, funds may be available for one to two teachers, but exceptions will be considered. Participation of teachers and community college faculty who are members of underrepresented groups (women, underrepresented minorities, and persons with disabilities) is strongly encouraged. Center or large research efforts may request support for a number of teachers commensurate with the size and nature of the project. For guidance concerning RET supplement requests, please consult with the cognizant ENG program director of the particular research program of the proposal or award.

An award decision will be based on internal review by the cognizant ENG program director and availability of funds in a particular program.

Results from any RET Supplement activity must be included in the annual project report of the award. The NSF FastLane Project Reports System requires inclusion of information on participants and on publications and products, as well as discussion of activities and contributions in education and human resource development.

A request for an RET Supplement to an existing award must be submitted via the NSF FastLane System. After login to FastLane, choose Award and Reporting Functions, then Supplemental Funding Request. Next choose the award to be supplemented. In the form entitled Summary of Proposed Work, state that this is a request for an RET supplement. In the form entitled Justification for Supplement, include the information requested above, limited to three pages. If an RET participant has been pre-selected, then a brief biographical sketch should be placed in supplementary documentation. Prepare a budget, including justication of the funds requested for teacher and community college faculty support and their proposed use. All teacher and community college faculty costs are entered under line F as participant support costs. An administrative allowance (limited to 25 percent of the participant stipend support only) is allowed for RET awards in lieu of indirect costs (enter at line I of the proposal budget). The term of an RET supplement may not exceed that of the underlying research project. The request is then forwarded to the institution's Authorized Organizational Representative for submission to NSF.

A request for an RET Supplement submitted as part of a proposal for a new or renewed grant or cooperative agreement is embedded in the proposal as follows. The description of the RET activity, as specified above and limited to three pages, is entered in FastLane in the section for supplementary documentation. The budget for the RET supplement is included in the yearly project budget. All teacher and community college faculty costs are entered under line F as participant support costs. An administrative allowance (limited to 25 percent of the participant stipend support only) is allowed for the RET portion in lieu of indirect costs (added into line I of the proposal budget). The budget justification for the proposal must contain a separate explanation of the RET supplement request, with the proposed teacher/community college faculty costs itemized and justified and a total given for the items plus administrative allowance.

B. Budgetary Information

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

Indirect Cost (F&A) Limitations: An administrative allowance, limited to 25 percent of the participant support stipend amount only (Line F.1. on the FastLane budget and Field E.2. on the Grants.gov budget), is allowed for RET Supplement and Site awards in lieu of indirect costs.

Other Budgetary Limitations: Total budget amount for an RET Site may not exceed $500,000 for up to three years, for approximately $165,000 per year. Total cost of an RET supplement is limited to $10,000 per teacher. For both the RET Site and RET supplement the budget includes a teacher's stipend and up to $1,000 for the cost of materials, equipment, software and other supplies for developing classroom instructions and experiments. An administrative allowance (limited to 25 percent of the teacher's stipend only and included in the $10,000 total) is allowed in lieu of indirect costs.

C. Due Dates

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

     July 06, 2007

     November 19, 2007

     Third Monday in November, Annually Thereafter

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:

- Must provide in-service and/or pre-service K-12 teachers or community college faculty with discovery based learning experiences in engineering labs/research facilities, which can be incorporated into classroom activities.
- At least two teachers or community college faculty must be recruited for the program from the same K-12 school/community college in order to ensure that outcomes of the program are more effectively disseminated to the participating institutions. Participants must be currently teaching a STEM subject at their institution in order to participate in the program.
- Research program must involve participants in an ongoing research project for a duration of at least six weeks. Shorter duration may be proposed with justification.
- Program must have a well-defined focus, with clearly articulated research projects and activities. Research

projects must have significant engineering relevance.

- Program must include a sustained follow-up plan between the faculty and the participants to ensure that the research experience is translated to classroom practice and the program provides maximum benefit to all participants.
- Program must include a detailed plan for evaluation of the project and classroom impact.

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or 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

awions 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.

VIII. AGENCY CONTACTS

General inquiries regarding this program should be made to:

- Mary Poats, ENG/RET Program Manager, Directorate for Engineering, Division of Engineering Education and Centers, 585 N, telephone: (703) 292-5357, fax: (703) 292-9051, email: mpoats@nsf.gov

- Radhakishan Baheti, Program Director, Directorate for Engineering, Division of Electrical, Communications and Cyber Systems, 675 S, telephone: (703) 292-8339, fax: (703) 292-9147, email: rbaheti@nsf.gov

- Cynthia Ekstein, Program Director, Directorate for Engineering, Division of Chemical, Bioengineering, Environmental, and Transport Systems, 565 S, telephone: (703) 292-7941, fax: (703) 292-9098, email: cekstein@nsf.gov

- Richard Fragaszy, Program Director, Directorate for Engineering, Division of Civil, Mechanical and Manufacturing Innovation, 545 S, telephone: (703) 292-8360, email: rfragasz@nsf.gov

- Sandra Loving, Program and Managment Analyst, Directorate for Engineering, Division of Industrial Innovation and Partnerships, 590, telephone: (703) 292-7084, email: sloving@nsf.gov

For questions related to the use of FastLane, contact:

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

ABOUT THE NATIONAL SCIENCE FOUNDATION

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

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

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

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

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

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

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

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

- **Location:**   4201 Wilson Blvd. Arlington, VA 22230

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

- **TDD (for the hearing-impaired):**   (703) 292-5090

- **To Order Publications or Forms:**

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

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

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records, " 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

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

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

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