National Science Foundation
4201 Wilson Boulevard
Arlington, Virginia 22230

NSF 12-052

Dear Colleague Letter - EFRI Research Experience and Mentoring (REM)

The National Science Foundation (NSF) Directorate for Engineering (ENG) Office of Emerging Frontiers in Research and Innovation (EFRI) continually seeks to further the progress in EFRI topic areas while broadening participation of underrepresented groups in science, technology, engineering, and mathematics (STEM) fields. This letter is to call your attention to a pilot opportunity to pursue both of these goals through supplements to active EFRI research awards.

PIs and CoPIs with current EFRI research awards may apply for supplemental funding for this Research Experience and Mentoring (REM) pilot program to support costs associated with bringing research assistants into the laboratory over the summer of 2012 to participate in research aligned with the goals of EFRI-supported research, and to continue mentoring the research assistants in the following academic year. Details of the EFRI program may be found at http://nsf.gov/funding/pgm_summ.jsp?pims_id=13708.

Introduction: NSF seeks to encourage EFRI-supported researchers to create carefully mentored research opportunities for people who might not otherwise become engaged in a research project, and to utilize contributions and talents of these participants to make further progress toward research goals. Ideally the experience will be mutually beneficial. Fresh eyes often bring fresh ideas. Research experiences are correlated with STEM success, while effective mentorship is impactful for all learners. An extensive 2011 study by The Committee on Science, Engineering, and Public Policy at the National Academies (*Expanding Underrepresented Minority Participation*) describes how mentorship is of even greater value for underrepresented populations in STEM. The National Science Board has also highlighted the value of strong, expert mentoring in the development of engineers in its 2007 report, *Moving Forward to Improve Engineering Education*.

The REM pilot program seeks to pursue this idea by offering the PI flexibility to design the specifics of implementation of the research experience and mentoring plan in ways that most productively leverage local expertise and infrastructure already supported by NSF.

Program Description: EFRI supports the active involvement of high-school students and STEM teachers, undergraduate STEM students and faculty (including community-college students and faculty), professors, and veterans in hands-on research in order to bring this rich research experience and contact with suitable STEM mentors into their lives. The main goals of the REM pilot program are to enhance EFRI-supported research while providing research experiences and mentoring opportunities to STEM students and/or educators that may ultimately enhance their career trajectory. A likely additional benefit is the possibility to build long-term collaborative partnerships among EFRI-supported researchers, the NSF university research community and local school districts.

Each REM supplemental funding request should be specific to the local setting, resources, and skills of the PI/team, but EFRI especially encourages partnerships with one or more of these types of institutions:

- inner city schools or other high-need schools
- community colleges that serve historically underrepresented populations
- four-year colleges that serve historically underrepresented populations

Requests for supplemental funding must include a recruitment plan, describing how at least six members of one or more of the following groups will be recruited as research assistants in each EFRI topic area:

- underrepresented minorities

- women and/or girls (in most STEM areas)
- veterans enrolled in post-secondary education
- persons with disabilities

EFRI seeks to encourage activities that are unique, creative, and site-specific. Effective summer research programs at this funding level typically have many of the following characteristics, which are provided here as general, non-rigid guidelines:

- Eight to ten weeks of summer research are encouraged; the research experience is to be enhanced by continuing interactions/mentorship throughout the following academic year;
- Well-designed, introductory training is provided to research assistants;
- Training for researchers (PI, Co-PI, and/or post-doc) on successful mentorship of less-experienced researchers is provided;
- Research assistants are encouraged to make creative contributions to the enterprise and participate in regular group meetings; and
- Research assistants are provided guidance in coauthoring publications and/or posters.

Requests for supplemental funding must include an evaluation component, including but not limited to a pre-and-post survey of participants each year. Attitudinal changes and/or changes to career trajectory should be measured; an initial Logic Model (describing expected outcomes of the activities undertaken, and the mechanism(s) to measure and evaluate those outcomes) should be provided. Longitudinal data will be expected where appropriate for renewals. The evaluation must be provided in the final report, so that NSF can gauge the value of providing these experiences and relate the program to the STEM pipeline.

Research assistants and mentors must make presentations at the annual EFRI grantee conference on a weekend in early March.

Anticipated Type of Award: The Principal Investigator may request REM supplements for 12 months (summer plus the following academic year), renewable twice (for a maximum of three years, so long as the original EFRI grant is active).

Eligibility: A request for supplemental funding may be made by the PI or CoPI of a currently active EFRI research award. Proposals may include collaboration with and/or placement of research assistants in other EFRI-supported laboratories. REM research assistant candidates must be United States citizens, nationals, or permanent residents.

Preparation of an EFRI-REM Supplemental Funding Request:
Information about requesting supplemental support is contained in Part II: Award and Administration Guide (AAG) of the NSF Proposal and Award Policies and Procedures Guide (PAPPG), available online at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=papp.

The following instructions supplement the AAG guidelines.

In the **Supplementary Documents** section, provide a **Research Assistant Mentoring Plan.** In no more than three pages, describe the individually customized mentoring activities that will be provided to the research assistants supported by this supplement. Mentoring activities may include, but are not limited to:

- Setting up a mutually agreed upon list of expectations and goals;
- Providing timely evaluations of progress towards expected goals;
- Providing professional development activities such as career/educational counseling, workshop participation, networking and internships;
- Providing guidance in effective scientific writing for publications and presentations at conferences/meetings;
- Providing opportunities for research assistants interaction in seminars or symposiums;
- Providing guidance on ways to improve teaching, leadership, communication, and mentoring skills;
- Providing guidance on how to collaborate effectively with researchers from diverse backgrounds and inter-disciplinary areas.

Prepare a budget, including a budget justification for the funds requested and their proposed use. The maximum annual amount (including any associated indirect costs) is $100,000. The budget will include travel/registration expenses for the research assistants to present their research findings at the EFRI grantee conference and other professional meetings, but it may not include tuition at the EFRI-supported institution(s). Costs related to hosting research assistants may vary from laboratory to laboratory, and the budget should include expenses related to providing research assistants with appropriate mentoring, materials, and laboratory access.

Research assistants may have income-earning requirements that might preclude their participation, so REM research assistants must be provided with a stipend for their participation. Again, details are left to the PI, but EFRI offers the following guidelines, based on other programs. These figures are only offered as guidance and do not take into account cost of living, etc.

- High School student: not less than $2800
- University/College/Community College student: not less than $4000
- K-12 Teacher or CC Faculty: about $6000
- College/University faculty: about one tenth average annual salary
- Veteran: approximately 2-months of the Post-9/11 GI-Bill Housing Basic Allowance for Housing (Calculator at https://www.defensetravel.dod.mil/site/bahCalc.cfm, setting pay grade to E-5.)

Housing stipends may be provided for out-of town research assistants above 18 years of age. High-school students should be local or should live with a parent or guardian; appropriate safety waivers and transportation waivers should be obtained from all participants, but are required for those under 18 years of age.

After you have prepared the request for supplemental funding, forward it to your organization's Sponsored Research Office, which will submit the request to NSF via FastLane. For questions related to the use of FastLane to submit the supplement request, contact the FastLane Help Desk: email fastlane@nsf.gov or telephone 1-800-673-6188.

Contacts for Additional Information: For questions or information on submission of an REM supplemental funding request, contact the managing Program Officer for the current EFRI award or one of the following REM Coordinators:

- Mary Poats, mpoats@nsf.gov
- Garie Fordyce, gfordyce@nsf.gov

Review Process: An award decision will be based on internal review and/or review by a panel of external experts, and on availability of funds. We aim to notify successful PIs at the beginning of April so that the recruiting plan can be implemented at that time.

Award Size and Duration: The Principal Investigator may request REM supplements for 12 months (summer plus the following academic year), renewable twice for a maximum of three years. REM supplements are nontransferable. The maximum annual amount of an REM supplement is $100,000.

Award Information: Anticipated funding for REM in FY 2012 is $500,000, subject to the merit of proposals received. The estimated number of supplements to be awarded is 5.

Submission Deadline: The deadline for submission of a REM request is 5:00 p.m., submitter's local time, on March 5, 2012.

Special Reporting Requirements: The annual and final reports must discuss the impact of the supplemental funding on increasing the participation of underrepresented groups in engineering. Quantitative data on race, gender, and disability are expected. EFRI anticipates that REM will open and facilitate new avenues for increasing the participation of underrepresented populations in engineering disciplines, and in turn, enhance the development of the U.S. engineering workforce in accordance with the America COMPETES Act (http://www.gpo.gov/fdsys/pkg/PLAW-111publ358/pdf/PLAW-111publ358.pdf) and the Engineer of 2020 report of the National Academy of Engineering

(http://books.nap.edu/openbook.php?record_id=10999&page=1) that foresees an engineering profession that remains underrepresented with respect to women and minorities in the year 2020.

We hope that you are inspired by this opportunity to design and implement a program that serves your research needs while simultaneously working to develop engineers of the future; we look forward to reading your innovative ideas.

Sincerely,
Sohi Rastegar
Director of EFRI Office