NATIONAL SCIENCE FOUNDATION
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NSF 23-012

Dear Colleague Letter: Opportunity for Active EFRI, ERC and IUCRC Awardees to Apply for Supplemental Funding through the Research Experience and Mentoring (REM) Program

October 12, 2022

Dear Colleagues:

The National Science Foundation Directorate for Engineering (NSF/ENG) continually seeks to advance scientific progress in research and innovation while broadening participation of underrepresented groups in science, technology, engineering, and mathematics (STEM) fields. This Dear Colleague Letter (DCL) seeks to inform the community about an opportunity to pursue both goals through supplements from the Research Experience and Mentoring (REM) Program to active Emerging Frontiers in Research and Innovation (EFRI) research awards, active Engineering Research Center (ERC) awards, and active Industry-University Cooperative Research Center (IUCRC) awards.

REM funding will support costs associated with bringing high school students, STEM teachers, undergraduate STEM students, faculty, and veterans to be engaged as Research Participants (RPs) in a research environment. RPs are expected to participate in research activities aligned with the EFRI-, ERC-, and IUCRC-supported research goals and receive structured mentoring over the summer. REM supplement recipients are required to extend structured mentoring into the academic year.

INTRODUCTION

NSF encourages EFRI-, ERC-, and IUCRC-supported researchers to create structured mentored research opportunities for high school students, STEM teachers, guidance counselors and academic advisors, undergraduate STEM students, faculty, and veterans who may not otherwise become engaged in a research project, and to utilize the contributions and talents of these participants to make further progress toward research goals. Research experiences and mentorship have been positively correlated with STEM trainee success. For example:

- Receiving effective mentorship in STEM has been shown to be impactful for all learners and can often strengthen persistence in STEM [1, 2, 3].
- Co-curricular activities which provide both authentic disciplinary experiences and mentoring support retention and engagement in STEM [4, 5, 6, 7].
- Mentoring and training reinforce and strengthen the persistence of underrepresented students in STEM courses and majors [5, 6, 8, 9].
- Offering mentoring and experiential opportunities is valuable for engaging K-12 students and teachers [6, 10, 11].

The REM Program seeks to stimulate the process of research exploration and interaction by offering the Principal Investigators (PIs) flexibility to design the research experience and mentoring plan for the RPs. The REM Program also encourages PIs to leverage local STEM-related expertise and infrastructure in the design of planned activities.

PROGRAM DESCRIPTION

The REM Program supports the active involvement of research participants (high school students, STEM teachers, guidance counselors and academic advisors, undergraduate STEM students, faculty, and veterans) in hands-on research to bring participants into collaboration with suitable STEM mentors and expose them to a rich research experience. Research participants must be recruited as cohorts to facilitate mentoring and research activities, community building, and provide mutual support.

The main goals of the REM Program are to provide research experiences and mentored opportunities to STEM students and/or educators that may ultimately enhance their career and academic trajectories while simultaneously enhancing EFRI-, ERC-, and IUCRC-supported research. The REM Program may also enable the building of long-term collaborative partnerships among EFRI-, ERC-, and IUCRC-supported researchers, community colleges, local four-year colleges, and local school districts.

Activities that are innovative and site-specific are encouraged. Effective REM programs typically have many of the following characteristics, which are provided here as general guidelines:

- Required mentorship training for researchers and EFRI-, ERC, or IUCRC-affiliated graduate students or postdoctoral researchers;
- Introductory training for RPs as part of the six to ten weeks of summer research (full time);
- Well-defined research plans for RPs;
- Continued mentorship of RPs throughout the academic year;
- Participation of RPs in research team meetings and topic-related conferences or

workshops; and
- Guidance for RPs in co-authoring publications and/or presentations/posters.

Each REM supplemental funding request **should be specific to the local setting, resources, and skills of the PI/Research Team**. The REM Program especially encourages partnerships with one or more of the following types of institutions:

- Inner-city schools or other high-needs K-12 schools;
- Community colleges that serve underrepresented populations; and/or
- Four-year colleges that serve underrepresented populations.

Requests for supplemental funding **must include a robust Recruitment Plan** for a cohort comprising at least six members. The Recruitment Plan should describe planned strategies for creation of an inclusive environment. PIs requesting a REM supplement are encouraged to recruit RPs from groups underrepresented in engineering, including but not limited to:

- Underrepresented minorities (Blacks and African Americans, Hispanics and Latinos, Native Americans, Alaska Natives, Native Hawaiians, and other Pacific Islanders);
- Women or girls;
- Veterans enrolled in post-secondary education; or
- Persons with disabilities.

Letters of collaboration demonstrating credible relationships with campus or community organizations may be helpful for demonstrating feasibility of the Recruitment Plan.

PIs requesting a REM supplement must provide a **Participant Research Plan**, as part of the summary of proposed work, describing types of research activities to which the RPs may contribute. The plan should include:

- Example projects, including descriptions of the types of tasks appropriate for REM RPs, any specialized equipment or setting, and what the RPs will be expected to contribute;
- Significance of the research area and, when appropriate, the underlying theoretical framework, hypotheses, research questions, etc.; and
- Expected outcomes from the research activities (research products, publications, skills, perspectives, etc.)

PIs requesting a REM supplement **must provide a Research Participant Mentoring Plan**, as part of the summary of proposed work, describing the mentoring activities that will be provided to the RPs supported by this supplement. Mentoring plans should identify the individual(s) who will serve as mentors, as well as describe their mentoring experience. Mentoring activities may include, but are not limited to:

- Establishing a mutually agreed-upon list of expectations and goals;

- Meeting in advance of the research experience in order to orient RPs, learn their research interests/preferences, and arrange placements;
- Providing or arranging for didactic training in advance of the laboratory experience;
- 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 and oral communications training for publications and presentations at conferences/meetings;
- Accompanying RPs at professional conferences and/or funding their participation;
- Providing opportunities for RP interaction in seminars or symposia;
- Encouraging networking among RPs, mentors, and PIs at periodic working lunches or occasional outings (off-site research team meetings or retreats);
- 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; and
- Providing field trips to related facilities and/or local facilities of engineering interest

REM supplement recipients are required to provide formal mentorship training for those individuals responsible for mentoring RPs. The training can be provided by the awardee's institution or other mechanisms, such as the NSF-supported Mentoring Catalyst (https://mentoringcatalyst.org/). Description of this training should be included in the Research Participant Mentoring Plan.

REM supplemental funding requests **must also include an Evaluation Component** as part of the summary of proposed work, including but not limited to:

1. An initial logic model describing expected outcomes of the activities undertaken;
2. Quantitative and qualitative methods for measuring outcomes. Interviews and/or instruments that assess the effectiveness of mentoring and its impact on RPs should include pre- and post-surveys of RPs (and possibly mentors, especially if graduate students serve as mentors), and may also include assessments that capture changes in RPs' skill sets, understanding of science/engineering principles, attitudes toward research, and career trajectories as a result of their participation in the program;
3. Longitudinal data will be expected where appropriate for PIs who are previous recipients of a REM supplement.

Use of an external evaluator is encouraged. Evaluation data **must be provided** in the final report to enable NSF to gauge the value of providing these experiences.

RPs and mentors are expected to **present at the annual REM grantee meeting**, usually held in conjunction with the Emerging Researchers National Conference in STEM (ERN) in

Washington, DC. Conference details can be found at http://www.emerging-researchers.org/.

ANTICIPATED TYPE OF AWARD

EFRI, ERC, and IUCRC Awardees may request REM supplements for up to 12 months (summer plus the academic year).

ELIGIBILITY

A request for supplemental funding may be submitted by the PI or co-PI of any currently active EFRI, ERC, or IUCRC research award or cooperative agreement. These supplemental funding requests may include collaboration with and/or placement of RPs in other EFRI-, ERC-, or IUCRC-supported laboratories. It is recommended that EFRI, ERC, and IUCRC grantees who wish to apply for REM supplemental funding contact their cognizant NSF Program Director prior to submission. REM RP candidates must be United States citizens, nationals, or permanent residents. It is the responsibility of the submitting organization to verify the eligibility of REM RP candidates.

PREPARATION OF A REM SUPPLEMENTAL FUNDING REQUEST

Information about requesting supplemental support is contained in Chapter VI.E.5 of the NSF *Proposal and Award Policies and Procedures Guide* (PAPPG).

In addition to the PAPPG requirements for supplemental support, the following materials must be included in the summary of proposed work, submitted as supplementary documents, or submitted with the budget as directed below, to apply for REM supplemental funding

- *Recruitment Plan*
  1-3 pages, to be included as part of the summary of proposed work under the section heading "Recruitment Plan", as described above.
- *Participant Research Plan*
  1-2 pages, to be included as part of the summary of proposed work under the section heading "Participant Research Plan", as described above.
- *Research Participant Mentoring Plan*
  2-3 pages, to be included as part of the summary of proposed work under the section heading "Research Participant Mentoring Plan", as described above.
- *REM Personnel*
  1-page supplementary document, to include the name, contact information, and relevant expertise for the individual who will be managing the day-to-day operations of the REM program as well as any other key personnel who will significantly interact with research participants.
- *Biographical sketches*
  Standard NSF three-page biographical sketches must be provided for the individuals

listed in ‘REM Personnel’ above, submitted as a supplementary document.

- *Collaborations*
  Provide letters of collaboration for collaboration with and/or placement of RPs in other EFRI-, ERC-, and IUCRC-supported laboratories, submitted as a supplementary document.
- *Evaluation Component*
  2-3 pages, to be included as part of the summary of proposed work under the section heading "Evaluation Component", as described above.
- *Budget*
  Must include a budget justification for the funds requested and their proposed use.

  The maximum annual amount that may be requested (including any associated indirect costs) is $110,000. The budget must include travel/registration expenses for RPs and mentors to participate in the REM grantee meeting to be held in Washington, DC. It must not include tuition at the EFRI-, ERC-, or IUCRC-supported organization(s). Costs related to hosting RPs may vary from laboratory to laboratory; the budget should include expenses related to providing RPs with appropriate mentoring, materials, and laboratory access.

REM RPs must be provided with a stipend for their participation during the summer research/mentoring component. Awardee organizations and Principal Investigators are responsible for determining the appropriate stipend amounts for their particular project based on: organizational policy or guidelines, location, cohort intended to attract, and the value of the REM experience to the research participant. Based on previous experience with the program and to attract the most qualified applicants, NSF suggests potential awardees may consider the below stipend amounts which are based on guidelines from similar NSF programs:

- High School student: $3000 (for 6 weeks)
- University/College/Community College (CC) student: $6000 (for 6 weeks)
- K-12 Teacher or CC Faculty: $8000 (for 6 weeks)
- College/University faculty: about one tenth of their average annual salary
- Veteran: approximately 2 months of the Post-9/11 GI-Bill Housing Basic Allowance for Housing (calculator at https://militarybenefits.info/military-pay-calculator/, setting pay grade to E-5.)
- Housing stipends may be provided for out-of-town RPs, 18 years of age or older. Local high-school students or recent graduates (under 18 years of age) should be lodging with a parent or guardian or may be housed in on-campus housing facilities if the university has a record of successfully housing minors (documentation should be provided).
- Travel stipends, such as those to attend the annual REM grantee conference may be provided for the RPs. RPs under 18 years of age may travel with the research team to

the annual REM grantee conference. Appropriate safety waivers and transportation waivers should be obtained from all participants but are mandatory for those under 18 years of age. Out-of-town RPs may be offered an allowance for occasional home visits.

Stipends may be offered during the academic year if research participants continue with research and mentoring activities.

All student costs should be entered as Participant Support Costs. Indirect costs (F&A) are not allowed on Participant Support Costs.

CONTACTS FOR ADDITIONAL INFORMATION

For questions or information on submission of a REM supplemental funding request, contact the cognizant NSF Program Officer for the current EFRI, ERC, or IUCRC award, or one of the following REM Coordinators

Alias Smith, alismith@nsf.gov
Dana Denick, ddenick@nsf.gov
Prakash Balan, pbalan@nsf.gov
Crystal Leach, crleach@nsf.gov

An informational webinar will be held for those interested in applying for REM supplemental funding. Details on the webinar (date, time and webinar link) will be posted on the ENG Emerging Frontiers and Multidisciplinary Activities (EFMA) homepage, on the Engineering Research Centers Association page (ERC Association), and on the Industry-University Cooperative Research Center (IUCRC) homepage in late October 2022.

REVIEW PROCESS

Award decisions will be based on internal review and/or review by a panel of external experts from academia and industry and pending the availability of funds. We anticipate notifying successful PIs by the end of January 2023 to facilitate timely implementation of the recruitment plan.

AWARD SIZE AND DURATION

The maximum amount of a REM supplement is $110,000. The Awardee may request REM supplements for up to 12 months (summer plus academic year). REM supplements are nontransferable.

AWARD INFORMATION

Anticipated FY 2023 budget for the REM program is approximately $2,640,000, subject to the availability of funds.

SUBMISSION DEADLINE

For Fiscal Year 2023, the deadline for submission of a REM request is 5:00 p.m., submitter's local time, on **December 16, 2022**.

For subsequent Fiscal Years, proposals will be accepted between August and the first Monday of November, 5:00 p.m., submitter's local time, of that Fiscal Year.

SPECIAL REPORTING REQUIREMENTS

The annual and final project reports of the active EFRI, ERC, or IUCRC award must discuss the impact of the supplemental funding on increasing the participation of underrepresented groups in engineering. Accumulated quantitative data on race, gender, and disability are expected. The 2019 NSF-NCSES, Women, Minorities, and Persons with Disabilities in Science and Engineering report documents the continuing underrepresentation of women and minorities in engineering disciplines. Since its inception, the goal of the REM program has been to open and promote new avenues to increase the participation of underrepresented populations in engineering disciplines, and thereby enhance the development of the U.S. engineering workforce. This goal is consistent with the American Innovation and Completeness Act (AICA; Title III, Section 305).

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 supplemental funding requests.

Sincerely,

Susan Margulies, PhD
Assistant Director
Directorate for Engineering
National Science Foundation

CITATIONS

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