

SC EPSCoR/IDeA

GEAR Collaborative Research Program (CRP)

SC EPSCoR/IDeA Solicitation Number 8-CRP2018

GEAR CRP Program Objectives

The goal of the GEAR CRP (Collaborative Research Program) is to encourage faculty researchers at the three South Carolina comprehensive research universities (CRUs), Clemson University, the Medical University of South Carolina, and the University of South Carolina; and predominately undergraduate institutions (PUIs) to build collaborative CRU/PUI academic research teams that will compete effectively for research funding. GEAR CRP grants will be awarded to build and enhance the network of scientists in the state that will conduct research related to the National Science Foundation (NSF) Research Infrastructure Improvement (RII) Track 1-Award entitled “*Materials Assembly and Design Excellence in South Carolina*” *MADE in SC*. The vision of the *MADE in SC* initiative is to discover and establish new and sustainable approaches for the design and assembly of hierarchical materials at multiple relevant length scales that service South Carolina’s STEM research, education, and workforce needs and invigorate economic development. The focus of this initiative is to discover and develop new intelligently designed optical and magnetic materials, stimuli-responsive polymeric materials, and interactive biomaterials.

Proposals submitted in response to the GEAR CRP solicitation:

- must include two investigators with a senior faculty from a CRU and junior faculty from a PUI.
- Preferably be a research collaboration in two of the *MADE in SC* research clusters: MCC, Thrust 1, Thrust 2, and Thrust 3. See description of the research clusters below.

MADE in SC Research Priorities

Proposals must respond to one of the following specific research thrusts. Highest preference is for proposals that integrate modeling and/or simulations with experimental research. Proposals must address one or more of the activities listed in the Attachment titled, “List of Research Activities by Research Cluster.” The four research clusters of *MADE in SC* are:

1. **Modeling and Computation Core (MCC).** The goal of the MCC is to develop multiscale models and computational tools synthesizing theories, methods, and infrastructure to provide optimized solutions for the materials system. Supporting goals are the development of advanced multiscale theoretical foundations, fast algorithms to handle high throughput computations, high resolution/fidelity imaging and visualization, and big data analytics including uncertainty quantification.
2. **Research Thrust 1 – Intelligently designed optical and magnetic materials.** The goal of Thrust 1 is to explore the inorganic crystal structure and mesoscale assembly of hybrid

inorganic and organic materials to control and tailor their optical and magnetic properties. These designed materials and assemblies will exhibit multi-functional, correlated, collective properties leading to, e.g., materials for enhanced energy transfer for lasing and harvesting applications.

3. **Research Thrust 2 – Stimuli Responsive Polymeric Materials.** The goal of Thrust 2 is to design and develop synthesis strategies for polymers able to respond to external cues leading to, e.g., materials for efficient water treatment and self-repairing materials for harsh environments.
4. **Research Thrust 3 – Interactive Biomaterials.** The goal of Thrust 3 is to develop a fundamental understanding of the effect of physical and chemical signals on cellular behavior across a range of length scales, leading to the development of interactive biomaterials, e.g., for use in regenerative medicine.

Award Information

Award Type: Grant

Maximum Funding Amount Per Project: \$60,000.00

Project Duration: 12 months

Estimate Number of Awards: Number of awards will be based on quality of proposals received and availability of funding.

Anticipated Start Date: January 2019

Eligibility

- Faculty members from any South Carolina college or university may serve as a Principal Investigators.
- Current GEAR CRP Awardees are not eligible for this funding cycle.
- A GEAR CRP team must consist of at least one “mentor” faculty from a CRU, as PI or Co-PI, and one or more “target” faculty from one or more PUIs. **Mentor faculty members** are defined as those with tenure or tenure-track appointments at a CRU who are currently serving as the PI or Co-PIs on a major, peer reviewed and extramurally funded research project or who have served in that capacity within the past two years. **Target faculty members** are those who are in the formative part of their careers, still developing their research programs, and with a strong potential to obtain independent support. In some cases, a senior faculty member may be considered target faculty if the individual is entering a new field of research or is collaborating on a project outside of his/her discipline.
- Proposals that include target faculty from a Historically Black College or University (HBCU) are encouraged.
- Proposals that integrate modeling/simulations and experimental research are strongly encouraged.

- A minimum of two undergraduate students must be identified for participation in the project. Students must be enrolled as a STEM major at the home institution of the target faculty and must have high probability of matriculation into graduate school.
- Graduate student support is encouraged especially for students from underrepresented minority groups.
- The home institution of the PI will serve as the fiscal agent and will establish a sub-award for the institution of the target faculty.

Deadline

Full Proposal – Monday, October 8, 2018, 5 pm EST

Full Proposal Content

The sections below represent the body of the proposal. Failure to submit the required sections will result in the proposal not being accepted or being returned without review. *Note: Where indicated, the number of pages refers to the maximum number of pages allowed and must not be exceeded.*

1. Cover Page (2 Pages)

Use the Cover Page form in Appendix A.

2. Project Summary (1 Page)

Proposals must contain an NSF compliant summary of the proposed project not more than one page in length. The Project Summary consists of an overview of the activities that would result if the proposal were funded, and a brief description of long-term plans for sustainability. It should specifically identify the MADE in SC research thrust areas and articulate the integration of modeling/simulations with experimental research. The Project Summary must also include a statement of objectives and methods to be employed, and two distinct sections: 1) statement on the intellectual merit of the proposed activity, and 2) a statement on the broader impacts of the proposed activity.

3. Project Description (7 Pages)

The Project Description should provide a clear statement of the work to be undertaken and must include the best scientific and strategic (long-term) objectives of the proposed work and expected significance, the relationship of this work to the present state of knowledge in the field, and the work plan. The Project Description section should have the following:

a. Objectives of the Proposed Work and Relevance

State the objectives of the proposed work and explain how it relates to *MADE in SC* research priorities outlined in the Program Objectives section. Proposers must identify the activity or activities that the proposal addresses from the "List of Research

Activities by Research Cluster” by specifying the Goal, Objective and the specific activity or activities.

b. Prior Relevant Research

Describe the proposed research project including significance of research and a review of relevant literature related to the proposed work.

c. General Research Plan

Describe the research framework, hypothesis, research questions, methods and procedures, potential outcomes, etc. Describe the broad design of activities to be undertaken (e.g., experimental methods and procedures). Proposers should address what they want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. The research activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified. These issues apply to both the technical aspects of the proposal and the way in which the project may make broader contributions. Proposers must clearly identify the accomplishments to be expected at the end of the project. Specific milestones must be carefully stated to aid in proposal evaluation.

4. Mentoring Plan (2 Pages)

Describe the mentoring that will be provided to target faculty supported by the project. Examples of mentoring activities include but not limited to: career counseling; training in preparation of grant proposals, mentoring skill, publications and presentations, guidance on how to effectively collaborate with researchers from diverse backgrounds and disciplinary areas; and training in responsible professional practices.

5. Plans to Leverage GEAR CRP Funding (2 Pages)

Faculty receiving funding support from GEAR CRP are required to use their preliminary data to submit at least one joint or multiple individual research proposals to at least one Federal or private research agency or foundation for a minimum of \$100,000.00 per year within 16 months of the initial award date. Describe the plans to leverage GEAR CRP funding and explicitly address the targets and opportunities for future project funding and sustainability of the effort. Outline a plan for submitting research proposals to national and private funding agencies to attract research grants. The plan must include the names of potential agencies and the programs and dates (if known) that will be targeted.

6. References Cited

Reference information is required. Each reference must include the name of all authors (in same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication.

7. Results from Prior SC EPSCoR/IDeA Support (1 Page per Award)

The purpose of this section is to assist reviewers in assessing the quality of prior work conducted with current or prior SC EPSCoR/IDeA Program funding. If any PI or Co-PI identified on the proposal has received a SC EPSCoR/IDeA Program award as a PI since January 1, 2017, the following information must be provided:

- Title of the project, start date, date completed, and award amount.
- Summary of the results of the work completed, including accomplishments, supported by the award. The results must be separately described under two distinct headings: Intellectual Merit and Broader Impacts
- A listing of the publications resulting from the award (a complete bibliographic citation for each publication must be provided either in this section or in the References Cited section of the proposal); if none, state “No publications were produced from this award”.

If the project was recently awarded and therefore no new results exist, briefly describe the proposed work.

8. Biographical Sketches (2 Pages per person)

A biographical sketch is required for the PI and the Co-PI(s). Biographical sketches of other senior personnel with whom the PI will collaborate may also be included. NSF format is required and must include and be limited to the following sections:

- **Professional Preparation** – undergraduate and graduate education and postdoctoral training (including location)
- **Appointments** – A list, in reverse chronological order, of all the individual’s academic/professional appointments beginning with the current appointment.
- **Products** – A list of: (i) up to five products most closely related to the proposed project; and (ii) up to five other significant products, where or not related to the proposed project
- **Synergistic Activities** – A list of up to five examples that demonstrate the broader impact of the individual’s professional and scholarly activities that focuses on the integration and transfer of knowledge as well as its creation.

For more information on NSF format, visit

https://www.nsf.gov/pubs/policydocs/pappg17_1/pappg_2.jsp#IIC2f

9. Budget

Use the Budget forms in Appendix B.

10. Budget Justification (2 Pages per institution)

The budget justification must be composed of no more than two pages for each institution and must include the following sections:

- Senior Personnel
- Other Personnel
- Fringe Benefits
- Materials and Supplies
- Equipment
- Domestic Travel Support
- Publication Costs
- Other Direct Costs

11. Current and Pending Support

The Principal Investigator and all senior personnel must complete Current and Pending Support document in Appendix C.

12. List of Conflicts

Provide conflicts of interest (COI) for each project participant on Appendix D. Conflicted individuals to be identified for each project participant include:

- PhD Advisor: PhD Advisor of the participant (a direct advisor, not simply a thesis committee member) at any time in the past
- PhD Advisee: PhD advisee of the participant (a direct advisee, not simply where student is on thesis committee) at any time in the past
- Co-author: a co-author of the participant (includes papers under review and in preparation) within the past 48 months
- Co-PI: a co-investigator of the participant (includes proposals under review and in preparation) within the past 48 months
- Postdoc Advisor: Postdoc Advisor of the participant (a direct advisor, not simply a collaborator) within the past 48 months
- Postdoc Advisee: Postdoc Advisee of the participant (a direct advisee, not simply a collaborator) within the past 48 months
- Collaborator: a collaborator other than those listed above within the past 48 months (do not list individuals who have merely shared or received data, software, or other intellectual property)
- Co-editor: a co-editor of the participant during the past 24 months

Budget Information

Funding for the GEAR CRP Program is intended to support salaries and fringe benefits, materials and supplies, domestic travel support, publication costs, tuition supplement, etc.

- The budget requested may not exceed \$60,000.00 per proposal.
- The budget for the target faculty institution must be included as a sub-award to the budget of the submitting institution. Only the budget of the submitting institution may include sub-awards.
- A maximum of one month of summer salary for the PI and/or Co-PI is allowed. No other senior personnel may receive funding from this program.
- Salary support is allowed for Post-docs, student researchers, and other staff.
- Indirect costs are not allowed under this solicitation.
- Cost-share is not required but encouraged.
- Awardees should ensure that costs claimed under SC EPSCoR/IDeA Program grants are allowable, allocable, and reasonable.

Submission Instructions

PIs should submit their proposals via the SC EPSCoR/IDeA Proposal Submission Portal at <https://scepscoridea.org/Solicitations/portal/index.php>. If not previously registered in the Portal, please follow the instructions on the main Portal page to register.

Proposal Review Process

Proposals that meet the eligibility requirements and the guidelines of this solicitation will be evaluated by external reviewers based upon the extent to which they meet specific criteria including but not limited to:

- The potential of the proposed research to advance knowledge and understanding within the research priorities outlined in the Program Objectives section (Intellectual Merit).
- The potential for the proposed activity to benefit society, advance desired societal outcomes and broaden participation of groups that are under-represented based on gender, ethnicity, and disability (Broader Impacts).
- Whether the plan for carrying out the proposed activities is well-reasoned, well-organized, and based on a sound rationale, and whether it incorporates a mechanism to assess success.
- How well qualified is the PI/Co-PI team to conduct the proposed activities.
- The adequacy of available resources to carry out the proposed activities.
- How well does the proposed activity integrate modeling/simulations with experimental research.
- The likelihood that the research will lead to extramural funding.
- How well does the proposed activity advance discovery while promoting, mentoring, training, teaching, and learning.

Award and Reporting Requirements

- Principal Investigators will receive notice of the GEAR CRP award/declination via email.
- The award will be made to the Lead Principal Investigator's Institution.
- A copy of all submitted proposals resulting from the GEAR CRP must be provided to the SC EPSCoR/IDeA State Office.
- All publications (e.g., research publications, press releases, other publications or documents about the research funded by the SC EPSCoR/IDeA Program) and presentations resulting from the GEAR CRP must include an acknowledgement of SC EPSCoR/IDeA Program support and a disclaimer. *“Research reported in this [publication, press release, presentation] was supported in part by the NSF and SC EPSCoR/IDeA Program under award number (NSF Award # OIA-1655740 and specific SC EPSCoR/IDeA grant number). The views, perspective, and content do not necessarily represent the official views of the SC EPSCoR/IDeA Program nor those of the NSF.”*
- GEAR CRP Teams will be required to present their research findings at the SC EPSCoR/IDeA State Conference. Therefore, travel expenses for the State Conference can be included in the budget.
- SC EPSCoR/IDeA Program reserves the right to conduct site visits during the project period for evaluation and reporting purposes. Awardees are expected to provide required information and documentation to the SC EPSCoR/IDeA Program staff and External Evaluator as needed.
- Reassurance of Responsible Conduct of Research (e.g., CITI Certification) are required for student researchers to be submitted to SC EPSCoR/IDeA Program State Office.
- Progress reports are due every six months after the start date of the award. A template will be provided to the PIs.
- A final report will be due 60 days after the end of the award.

Contact Information

General inquiries regarding this program should be made to:

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