STEM Pathways for Advancement, Research, and Knowledge (SPARK)
SC EPSCoR Solicitation Number 10-SPARK2025 **(Revised 9/16/2025)**

A. Introduction

The program aims to increase the number of students interested in STEM degrees. The SC EPSCoR SPARK program funds high quality proposals to support STEM research and to advance and expand knowledge about STEM among students. Proposals can focus on either the National Science Foundation (NSF) "A*I-Enabled Devices for the Advancement for Personalized and Transformative Health Care in South Carolina*" (ADAPT in SC) project research priorities or other priorities of the *Vision 2030 SC Science and Technology Plan*.

The ADAPT in SC project builds research capacity in the implementation of Artificial Intelligence (AI) in biomedical devices at the nexus of life and social sciences, bioengineering through fundamental research, education, workforce development, and industry engagement.

The Vision 2030 SC Science and Technology Plan states "*Future growth of science – and technology-intensive companies and industries in South Carolina requires workers with S&E (Science and Engineering) degrees (Associate through Doctoral level), especially computer science, engineering, and data science, in addition to physical and life science degrees. This requires strong K-20 STEM education, including applied experiences, for all South Carolinians to ensure a robust workforce talent pipeline*".

ADAPT in SC Research Priorities

Proposals may address one or more of research themes of ADAPT in SC:

- **Biomedical AI** - Proposals on this topic will conduct research related to the development of theoretical foundations of biomedical AI, AI-ready data acquisition and preprocessing, multimodal data fusion technologies, deep learning algorithms, physics-informed ML models, and software tools to facilitate the use of mechanistic and AI models, sometimes with limited amounts of data.
- **XAI-enabled Biomedical Devices for Diagnostic and Planning Applications**. Proposals on this topic will use XAI to improve the explainability of the diagnostic or treatment decisions made from multimodal clinical data to provide insights into important causal factors and to obtain domain experts' trust, high prediction accuracy, and safe, continuous workflows from initial diagnosis to treatment end.
- **DL-Imaging Model-Enabled Biomedical Devices for Personalized Prognostic and Treatment Applications**. Proposals in this area will conduct fundamental research on creating DL models for AI-enabled biomedical devices for prognosis and/or treatment from limited data. Currently, there is a lack of expertise in foundational DL research in CRUs in SC. Thrust 2 aims to advance the field of AI-enabled medical devices for prognosis and/or treatment. The primary outcome of this thrust will be fundamental knowledge that governs generating high-performance, generalizable DL algorithms from limited data.

- **DT-Enabled Biomedical Devices for Rehabilitation and Therapy**. Proposals in this area should address AI-enabled rehabilitation DT as a platform for clinicians to design an optimal rehabilitation strategy for a specific patient to realize a personalized treatment pathway. For diabetes, cancer, or septic patients, a DT can provide an intelligent assistant for the physician and patient to develop and optimize the treatment pathway dynamically. For the elderly and less serviced communities, DTs would provide additional AI-enabled, user-friendly instructional materials and devices.

Vision 2030 South Carolina Science and Technology Plan Priorities

Proposals may address one or more of the high-priority research areas and target industry sectors identified in ***Vision 2030 South Carolina Science and Technology Plan*** (SC S&T Plan). The Plan identifies four high-priority research areas: AI, Machine Learning, and Data Science; Advanced Materials; Systems Engineering; and Precision Biology.

Vision 2030 identified four target industry sectors: Advanced Manufacturing; Human Health Life Sciences; Information Technology; and Clean Tech, Sustainability, and Resiliency. PI should consult the SC S&T Plan for more details.

B. Funding Priorities

Funding priority will be given to proposals that show significant promise to increase the number of students interested in STEM degrees. To achieve this, the SPARK program provides funding for the following priorities, but encourages other creative ideas:

- Engaging Undergraduate Students in Research
- Supporting Scientific Conferences, Symposia, and Meetings
- Other Approaches

1. Engaging Undergraduate Students in Research

The SPARK Program aims to increase research participation of students in STEM during the academic year and/or the summer. Research experiences can take place either at the students' home institutions or at another institution in South Carolina. Funding can be allocated to student stipends, travel (e.g., to research sites, conferences), materials and supplies for research, and salary support for faculty and staff. The proposal must impact a group of at least three students.

Proposals should include an implementation and management plan and must include the following:

- Description of the student research project (e.g., significance of research, relationship to ADAPT in SC or Vision 2030 SC Science and Technology Plan, research plan, etc.).
- Proposals must identify the proposed start and end dates of the research experience, research location, and student responsibilities in the research project.
- Qualifications of research mentor(s) including previous experience in student research mentoring
- Students recruiting, selection, and mentoring plan including assessment.

- Opportunities for students to disseminate results (e.g., presentations, publications, undergraduate theses, etc.).

2. Supporting Scientific Conferences, Symposia, and Meetings

The SPARK Program supports hosting scientific conferences, symposia, and workshops that will increase the interest of South Carolina students (undergraduate, high school and middle school) in STEM. Proposals under this funding priority are envisioned to reach students from across South Carolina.

Conferences and meetings may provide a platform to present research and scholarly work results, STEM specific discussions, and engage students to stimulate interest in STEM majors and degrees. Funds may be used for venue rental, speaker fees, equipment rental, publication costs, supplies, and travel support. The proposed activity must occur during the award period. PIs must submit promotional/marketing materials to the SC EPSCoR State Office for review before publication. Acknowledgement of SC EPSCoR funding must be included on all promotional and marketing material.

Proposals in this category should address the following:

- An articulation of the project's goals, impact, and execution plan.
- The purpose and justification of the event, including the scientific need, how the activity will address the scientific need, and how it will increase interest in STEM.
- Description of the event to include the dates, location, topics and tentative agenda, audience type, projected number of attendees, and exhibits.
- Description of the event planning process.
- Brief description of the qualifications of tentative speakers, panel members, and moderators.
- Description of how students will be selected.
- Description of marketing plan to promote the event.
- Description of other sources of funding that will support the activity, if any.

3. Other Approaches

The SPARK Program will support funding other creative activities that aim to increase the number of South Carolina students in STEM. Below are some examples:

STEM Research Experiences for South Carolina High School Students and Teachers. Funding can be allocated to materials and supplies, housing, and meals, location and/or equipment rental, and salary support for faculty and staff. Proposals should address the following:

- An articulation of the project's goals, impact, and execution plan.
- Description of the research experience, start and end dates, location, estimated number of participants, recruitment and selection process, marketing plan, opportunities to disseminate results, other sources of funding to support the activity, and plans to follow up with participants upon conclusion of research experience.
- Description of the activities that will be carried out, person(s) responsible and their experience with the proposed activity, and the expected impact and outcomes.

- Proposals for research experiences for high school students should describe how the proposed activity will increase college and career readiness.
- Proposals for research experiences for teachers should address how the proposed activity will improve instructional practices and increase student learning.
- ***NOTE:*** Institutional approval (e.g., Pre-College Program Office) is required for research experiences for high school students. Written institutional approval is required to be submitted to the SC EPSCoR State Office prior to award start date.

STEM Camps for South Carolina High School Students and/or Middle School Students. Funding can go towards materials and supplies, housing and meals, transportation, salary support for faculty and staff, stipends for camp counselors, evaluator services, location and/or equipment rental, and portion of insurance coverage for minors. Proposals should address the following:

- An articulation of the project's goals, impact, and execution plan. This should include a description of the STEM topics to be included in the camp, start and end dates, location, expected number of participants, marketing plan, student recruitment and selection process, opportunities to disseminate results, other sources of funding to support the camp, and plans to follow up with participants upon conclusion of the camp.
- Describe the activities that will be carried out, person(s) responsible, experience with proposed activity, and projected impact and outcomes.
- ***NOTE:*** Institutional approval (e.g., Pre-College Program Office) is required for STEM camps for high school students and middle school students as they are minors. Institutions must ensure background checks of all persons working with students including paid, volunteer, new, and reoccurring persons; securing driving records for persons transporting minors; and procedures for handling student medications at camp. Written institutional approval must be submitted to the SC EPSCoR State Office prior to award start date.

STEM on the Move. To take science (models, lectures, etc.) to middle and high schools. A successful proposal that is designed to bring hands-on science models, engaging lectures, and interactive STEM experiences to middle and high schools should include:

- An articulation of the project's goals, impact, and execution plan. This should include a description of planned activities, including the types of science models and lectures to be built/used, the STEM concepts covered, measurable objectives such as addressing key areas of STEM, the number of schools visited, and students reached. PIs should ensure that the schools and students visited represent a broad cross-section of schools and students in South Carolina.
- Description of the target audience and school selection criteria.
- The roles of team members and any partner organizations should be specified.
- An evaluation plan must be included to measure the program's effectiveness through surveys or learning assessments (pre- and post-tests are acceptable with analysis).

Other creative ideas. Programs that can result in increased interest in STEM degrees among South Carolina students.

C. Award Information

Maximum Funding Amount Per Award: $25,000 (Revised 9/16/2025)

Award Duration: 18 months

Estimate Number of Awards: Depends on quality of proposals and availability of funds.

Anticipated Project Start Date: Projects can start as early as May 1, 2026.

D. Who May Apply?

- Proposals may be submitted by investigators from any South Carolina college or university.
- Former SC EPSCoR Program Seed Funding PIs (e.g., GEAR, GEAR CRP, SPARK, Phase-0) who did not submit final project reports to the SC EPSCoR State Office are not eligible to apply.

E. Deadline

Full Proposals are due by 5:00pm on October 09, 2025.

F. 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: The number of pages for each section below (shown in parentheses) must not be exceeded.*

1. **Proposal Cover (2 Pages)**

   Use the Cover Page form in Appendix A.

2. **Project Description (7 Pages)**

   The Project Description should provide a clear statement of the work to be undertaken and must address the requirements outlined above. Proposals must articulate relevance to ADAPT in SC or Vision 2030 SC Science and Technology Plan priorities, the potential to increase the STEM talent in South Carolina including increasing the number of students interested in STEM degrees, potential outcome and impact, and the method of recruitment and selection. A statement about the merit, the potential impact, timeline for implementing proposal activities chart, and plans to leverage SPARK funding to sustain the proposed activities should also be included in this section. Failure to address the requirements listed will result in administratively declining the proposal.

   Include a timeline for implementing proposal activities. Describe each major proposal activity and identify the quarters during which the proposed activity will be conducted. Each activity must list the name(s) of the party responsible for completing the activity. Employ the chart template below. Add or delete rows as needed.

Activity	Year 1				Year 2	
	Q1	Q2	Q3	Q4	Q1	Q2

3. **Plans to Leverage SPARK Funding**

   Describe the plans to leverage SPARK funding and explicitly address the targets and opportunities for the sustainability of the proposed activities and possible future funding.

4. **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), article title, journal title, book title, volume number, page numbers, and year of publication.

5. **Results from Prior SC EPSCoR Support (1 Page per Award)**

   If the senior personnel have not received support from SC EPSCoR, include a statement to the effect. The purpose of this section is to assist reviewers in assessing the quality of prior work conducted with current or prior SC EPSCoR funding. If the PI identified on the proposal has received a SC EPSCoR award as a PI since January 1, 2020, the following information must be provided:

   - Title of the project, start date, date completed, and award amount.
   - A brief summary of the results, including accomplishments.
   - Indicate whether publications or other products resulted from the award, and provide a complete list, if any.

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

6. **Biographical Sketches**

   A biographical sketch is required for the PI and Co-PI in NSF format. For more information on the NSF format, visit https://new.nsf.gov/funding/senior-personnel-documents#biographical-sketch-0bd. Biographical Sketch must be created and certified in SciENcv (Science Experts Network Curriculum Vitae).

7. **Budget**

   Use the Budget form in Appendix B.

8. **Budget Justification (2 Pages Maximum)**

   The budget justification must be composed of no more than two pages and must address every budget item requested.

9. **Synergistic Activities**

   A one-page Synergistic Activities document is required for all senior personnel in NSF format. For more information on the Synergistic Activity format, visit https://new.nsf.gov/funding/senior- personnel-documents#synergistic-activities-ec2

G. Budget Information

- Senior Personnel salary cannot exceed 20% of the requested amount (not including fringe benefits).

- Salary support is allowed for post-docs, graduate and undergraduate student researchers, and other technical staff.
- Indirect costs and tuition are not allowed under this solicitation.
- The SPARK program is a cost-reimbursement program and SC EPSCoR Program will reimburse paid expenses NOT incurred expenses.
- Awardees should ensure that the costs claimed are allowable, allocable, and reasonable.

H. Submission Instructions

The proposal must be single space, have 1-inch margins, use 11 or 12 find size. Submit proposals via https://scepscor.inforeadv4.com/.

I. Proposal Review Process

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

- Merit, potential of broader impact, and potential to increase interest of students in STEM degrees.
- Qualifications of the PI and project team to conduct the proposed activity.
- How well the proposal addresses the specific requirements of the SPARK Program Solicitation and its potential for success, including mentoring of students, budget considerations and potential for dissemination of results.

J. Award and Reporting Requirements

All publications (e.g., research publications, press releases, other publications or documents about the research funded by the SC EPSCoR Program) and presentations resulting from the SPARK ***are required*** to include an acknowledgement of SC EPSCoR Program support and a disclaimer. "*Research reported in this [publication, press release, presentation] was supported in part by the U.S. NSF and SC EPSCoR Program under award number (U.S. NSF Award # OIA-2242812 and specific SC EPSCoR grant number). The views, perspective, and content do not necessarily represent the official views of the SC EPSCoR Program nor those of the U.S. NSF.*"

- All publications and presentations resulting from the award must include an acknowledgement of SC EPSCoR Program support and a disclaimer: "*Research reported in this [publication, press release, presentation] was supported in part by the U.S. NSF and SC EPSCoR Program under award number (U.S. NSF Award # OIA-2242812 and specific SC EPSCoR grant number). The views, perspective, and content do not necessarily represent the official views of the SC EPSCoR Program nor those of the U.S. NSF.*"
- Students involved in research are encouraged to present their research findings at SC EPSCoR Annual Conference.
- For awards involving student research, Reassurance of Responsible Conduct of Research (e.g., CITI Certification) are required for student researchers and should be submitted to SC EPSCoR Program State Office.

- Principal Investigators will be required to provide email addresses of Undergraduate Students, Graduate Students, and K-12 Teachers supported by the SPARK Award to the SC EPSCoR State Office for evaluation purposes.
- Awardees are expected to provide required information and documentation to the SC EPSCoR Program staff and External Evaluator as needed. SC EPSCoR Program reserves the right to conduct site visits during the project period for evaluation and reporting purposes.
- 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 no later than 60 days after the end of the award.

K. Contact Information

Inquiries should be made to:

Megan Souter, MBA
SC EPSCoR Grants and Contracts Manager
1000 Catawba Street
Columbia, South Carolina
Megan.souter@scra.org