

## **MUREP Inclusion Across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (MUREP INCLUDES)**

**Title: Developing NASA Pathways to Engineering and Experiential Research for Student Success: NASA PEERSS**

**Organization: Alabama State University**

**Primary Investigator: Michelle J. Foster**

**Summary:** To meet the demands of a diverse and technologically advanced society, Alabama will have to close the gap of racial inequality in engineering. Completion rates suggest activities designed to broaden participation of underrepresented minorities (URMs) in science, technology, engineering, and mathematics (STEM) degree programs appear to be effective. In 2016, an Alabama Historically Black College or University (HBCU) was one of the top 5 institutions in the country to confer the most undergraduate degrees to Black students. State schools made the list of top producers for 4 of the 5 largest engineering sub-disciplines among Black students. However, the presence of top-producing programs is not sufficient to remedy the racial and gender inequities in engineering in the state. In Alabama where roughly 32% of 18-24 year olds are Blacks, only 11% of all engineering bachelors' degrees were awarded to Black students according to the latest available study. A multi-institutional partnership must be established to recruit, retain, and graduate more URMs in engineering to dramatically impact the trajectory of the state of Alabama. Our long-term goal is to create collaborative curricular and co-curricular programs between Alabama universities to better prepare URMs in engineering disciplines to function effectively in an advanced scientific and technological society. The objective of the Developing Emergent Engineers and Physicists (DEEP) Program is to engage STEM subject matter experts, professional organizations, social science researchers, and industry partners to create an engineering learning community. A critical need for such a learning community at Alabama State University (ASU) is evidenced by the fact that the University endeavors to expand its engineering offerings to accommodate companies and federal agencies that desire to recruit students with the requisite engineering background and technical skillset. We also have students with the desire to pursue degrees in engineering sub-disciplines and related fields. Creating pathways to expose students to research relevant to NASA and other employers while enhancing engineering curricula across the state will afford our students the opportunity to pursue their dreams. We have strong institutional support for the program from key academic administrators. The executive committee has representation from Alabama A & M University, Auburn University, and Tuskegee University faculty and administrators. We propose three primary objectives for the program: Objective #1: Develop an academic support system for underrepresented minority engineering-related majors. We will provide tutoring, bridge programs, and mentoring support for DEEP learning community members. Objective #2: Provide career development activities for underrepresented minorities in STEM to prepare for the engineering workforce. Partners will create professional development and mindset seminars to help students develop 21st-century skills. Objective #3: Increase underrepresented minority student exposure to and preparedness for NASA-relevant research opportunities. We will infuse engineering research modules into existing coursework, host interdisciplinary NASA seminars, and offer research experiences at partner institutions. The successful completion of this project will result in 3 project outcomes: First, as a result of the DEEP learning community, ASU's

recruitment, and retention of URM engineering students will increase. Second, DEEP participants will demonstrate higher levels of scientific literacy proficiency than non-DEEP participants. Finally, engineering students will develop a symbiotic relationship to support each other with achieving academic and career milestones. The DEEP Program will enable us to provide training and engineering expertise to URM students in STEM and attract agencies who aspire to diversify the engineering workforce.