



Minority University Research and Education Project (MUREP)

Institution: Florida A & M University

Award Name: MUREP Institutional Research Opportunity (MIRO) - Group 8

Award Number: 80NSSC24M0175

Title: Integrative Space Additive Manufacturing (In-Space AM): Opportunities for Workforce-development in NASA Related Materials Research and Education

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Summary: The Florida Agricultural and Mechanical University (FAMU) Center for Integrative Space Additive Manufacturing (In-Space AM): Opportunities for Workforce-development in NASA Related Materials Research and Education will establish research and student engagement collaborations between FAMU, researchers and educators at NASA's Goddard Space Flight Center (GSFC) and Marshall Space Flight Center (MSFC), and a number of industry partners. The objective is to develop novel composite materials, characterize, and to assemble/manufacture them into novel structures and devices of relevance to NASA applications. Of particular interest is the In-Space Manufacturing Program (ISM) -- the main goal of which is to enable the manufacturing technologies and processes required to provide on-demand sustainable operations for Exploration Missions. Recent efforts at FAMU have led to the National Science Foundation funded CREST (Centers of Research Excellence in Science and Technology) Center on Additive Manufacturing being established to focus on materials development and processing for a number of applications. Using these developments, we would like to propose projects of interest to NASA with an aim of establishing long-term collaborations, to improve the infrastructure at FAMU and to train the next generation of minority students in space related research. The project will advance NASA's STEM Engagement strategies through a program of research and technology development a materials-to-manufacturing framework for research in 3D printing of a variety of materials and devices (strain sensors, radiation shielding, biosensors, functional tissues), engagement of graduate and undergraduate university students in research and internships at GSFC and MSFC, and the development of a correlated STEM engagement program targeted community colleges (Hillsborough Community College and Tallahassee Community College), and at middle and high school students to provide an expanded engagement and retention framework in collaboration with Florida State University and Virginia Tech. The project will align FAMU's current strengths in Chemical and Biomedical Engineering and the newly established Department of Materials Science and Engineering, and research programs, engineering resources, and capabilities at GSFC and MSFC. As a result of this project, we expect to produce several African American / Hispanic Ph.D.s, and directly impact 30-40 undergraduates and impact hundreds of future undergraduate students through established research infrastructure, internship, courses, and outreach programs.

