Minority University Research and Education Project (MUREP)

Institution: San Jose State University

City/State: San Jose, CA

Award Name: MUREP Partnership Learning Annual Notification (MPLAN)

Award Number: N/A

Title: Designing Resilient Battery System for Space/ STTR: T3.04 Advanced Low-Temperature Secondary Batteries

PI: Santosh KC

PI Email: N/A

Award Fiscal Year: FY2024

Summary:

Developing advanced low-temperature secondary batteries is crucial for space exploration, where extreme temperatures are often encountered. Traditional lithium-ion batteries, commonly used in space applications, face significant challenges in such conditions, including reduced performance and potential damage to internal components. However, advancements in battery technology (high energy density, solid-state battery, battery management system) offer promising solutions to address these challenges. In this project, a novel battery system is proposed that can be utilized in extreme conditions. The optimal design of the battery system will be performed with computational modeling and simulation and experimental device fabrication and measurements. The optimum battery stacking, thermal management, packaging, and overall battery management will be involved to achieve the desired outcome. A collaborative team (Dr. KC and Dr. Zaidi) will design the battery system that is viable at the low temperature environment applicable for NASA missions. PI and the team will perform modeling and simulation, experimental measurements, and engage in a research project directly with NASA.