

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

**Title: Proactive Pathways of Excellence to Engage Minority Students in Aerospace Engineering**

**Organization: Texas A&M Kingsville**

**Primary Investigator: Hua Li**

**Summary:** Texas A&M University-Kingsville (TAMU-K), a Hispanic Serving Institution (HSI) and a Minority-Serving Institution (MSI), is leading the effort to develop an MSI-led coalition to broaden participation and enhance the education of underrepresented minorities (URMs), especially Hispanic and female students in South Texas, in Aerospace Engineering and related STEM fields. The proposed project's goals are to 1) broaden participation in Aerospace STEM education and the Aerospace workforce by working through a strong coalition consisting of multi-sector partnerships that unite the expertise and resources of a broad range of stakeholders at the federal, state, and local levels; and 2) understand and identify the extrinsic and intrinsic motivational factors of URMs, especially Hispanic and female, which will guide their interests and persistence in Aerospace related STEM majors. This project's long-term goal is to develop the first Aerospace Engineering Bachelor of Science program in South Texas and expand its capacity through multi-sector partnerships to synthesize and enhance the broadening of participation of historically underserved groups. TAMU-K will partner with Laredo College, Del Mar College, South Texas College, local high schools and libraries, NSF INCLUDES STEM Core Alliance, the Maintenance Airworthiness Engineering Division of the Systems Engineering Directorate at Corpus Christi Army Depot, the Texas Space Grant Consortium, the Southwest Research Institute, the Project Management Institute, and other collaborators. Built upon the NASA INCLUDES planning grant, this project addresses an essential challenge of 21st century American society: to confront the lack of a diverse and STEM-capable workforce that leverages the creativity and talents of all society to send humans again to the Moon and on to Mars. The deficit will not be possible to eliminate without the participation of all members of society. Hispanics are the fastest growing minority group in the U.S. and are projected to constitute 29% of the population by 2060. South Texas remains historically underserved and economically disadvantaged with a majority Hispanic population. However, with the booming SpaceX in the Boca Chica and other aerospace companies, South Texas has a strong and fast-growing need for aerospace-related employees despite COVID-19 concerns and is becoming the next Cape Canaveral of the 21st century. The proposed project will address critical issues from a national and a regional perspective by creating three proactive pathways that will provide sustained inspiration and seamless transition for URMs to join the highly needed Aerospace workforce. By involving institutions that have strong minority programs and are located in areas with diverse demographics, this project will develop and implement different intervention activities focused on Aerospace Engineering for pre-college and college education in high school, community college, and university levels. Research projects and concepts will be integrated into the intervention activities. Complete integration of the educational and research efforts will result in innovations including new ways of organizing ideas relevant to NASA's mission. The proposed project will be in constant interaction with local communities and the private sector, learning about the professional competencies that the industry and

society require. A collective impact approach, consisting of a common agenda, shared measurement, mutually reinforcing activities, continuous communication, and backbone organization, will be used to develop a strong MSI-led coalition to ensure the success and continuation of the proposed project. The MSI-led coalition will provide an integrative approach to the education process aimed to produce a diverse and STEM-capable workforce that leverages the creativity and talents of all sectors of society. All knowledge generated in the project will be transferable to and applicable to other HSIs/MSIs.