

## **MAIANSE CONNECTing Indigenous Culture and Science Through Co-design of STEM (MAIANSE CONNECT)**

**Title: NASA MAIANSE CONNECTing Scheme for Promoting Indigenous Culture and Ethics among Students (SPICES) with STEM**

**Institution: Navajo Technical College**

**City/State: Crownpoint, NM**

**PI: Ragavanatham Shanmugam**

**Summary:** This “NASA MAIANSE CONNECTing Scheme for Promoting Indigenous Culture and Ethics among Students (SPICES) with STEM” is led by Navajo Technical University (NTU) to (i) Increase Indigenous students’ interest and involvement in STEM fields, (ii) Broaden participation of Indigenous communities in STEM fields, (iii) Co-create curricula and research projects in place-based STEM activities that braid NASA unique content with Indigenous culture, and (iv) Strengthen the capacity of NTU to graduate students. NTU will collaborate with the following alliance partners: i) Florida Atlantic University (FAU), ii) Kennedy Space Center (KSC), iii) Ames Research Center (AMC) and Armstrong Flight Research Center (AFRC), iv) Council for Diversity, Equity, Inclusion and Accessibility (DEIA), v) Raman Engineering LLC, vi) Ganado School District, vii) Navajo Preparatory School, viii) Community Youth Agency (Crownpoint) and ix) Octavia Fellin Public Library (OFPL). The NASA MAIANSE CONNECTING SPICES activity seeks to develop STEM ecosystems at NTU through the creation of co-designed STEM engagement activities with a focus on weaving NASA unique assets with community needs and partnerships and increase the number of Indigenous students participating in NASA STEM engagement activities. Indigenous students will present their NASA STEM relevant learning activities in professional organizations (American Indian Science and Engineering Society – AISES, Society for the Advancement of Chicanos/Hispanics and Native Americans in Science-SACNAS, National Action Council for Minorities in Engineering - NACME, The American Indian College Fund). NTU will create a strategic mentorship model involving faculty mentor, NASA mentor, an Indigenous community leader, and an Indigenous NASA employee. NTU will co-create educational curricula and research projects in culturally relevant STEM activities that weave NASA content with Indigenous culture. NTU will perform research and offer education that will directly support NASA’s four Mission Directorates. NTU will focus on this project on the following subject areas: a) Earth Sciences/Geology, b) Climate Sciences/Change-Geospatial tools and knowledge, c) Agriculture/Plant Science/Botany/Biology, and d) Additive Manufacturing. NTU will create more baccalaureate and graduate degree programs, which will be beneficial and are in high demand areas. The strength and academic excellence at NTU as a result from the execution of this proposed project will be used as a leverage to attract more future funding. The Evaluation Plan is based on a logic model taking into account the project’s inputs, activities, outputs, and outcomes. NTU will focus on the Indigenous community needs in building the NASA STEM curricula and research activities. NTU will evaluate Indigenous epistemologies and pedagogies and take necessary action to integrate them into curriculum development and will adopt interweaving Indigenous approaches which involve (i) goals; (ii) learning outcomes emphasizing cognitive, emotional, physical, and spiritual development; (iii) learning activities which include land-based, narrative, intergenerational, relational, experiential, and/or multimodal; (iv) holistic

assessment; (v) relationship opportunities for learning in community, intergenerational learning, and learning in relationship to the land; and (vi) format which includes learning beyond the classroom. In order to clearly articulate the entire scope of the Evaluation Plan (with both formative and summative evaluation of various program components), the evaluation questions will be organized according to two distinctions: type of evaluation, with both process/formative and outcome/summative evaluation; and program component, with 1) student learning activities (including teachers' use of novel NASA STEM activities; students' engagement with NASA STEM activities; and change in student outcomes), and 2) community engagement activities.