Minority University Research and Education Programs
(MUREP) Small Programs (MSP)
Administered by (Multiple Grantees)
Type of Agreement (Multiple Grants)
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PROJECT DESCRIPTION

MUREP strives to achieve the full participation of Minority Serving Institutions (MSIs) in the NASA-sponsored research and education community, as well as in enabling academic excellence and outstanding achievements. MUREP Small Projects (MSP) is an umbrella term for minority science, technology, engineering and math (STEM) education initiatives that are part of NASA's MUREP portfolio. MSP funds innovative STEM projects that address NASA's MUREP priorities, with an emphasis of identifying gaps or areas where funding of innovative projects will enhance the Higher Education portfolio and strengthen its ability to meet Agency objectives.

PROJECT GOALS

MSP's goal is to fund innovative STEM projects that address NASA's MUREP priorities. As funding is available (based on HQ budget and existing MSP portfolio of projects), MSP will release solicitations targeting specific MUREP portfolio needs. The objectives to be met by these solicited projects will depend on the identified needs in the MUREP portfolio. MSP solicitations will state the education PART measures to be addressed by the proposals. The proposals will be evaluated and funded based on how effectively they meet these objectives while leveraging and/or contributing to existing NASA education projects. MSP is intended to provide initial funding of these projects for a specified term while they strengthen and transition to other funding sources. Recurring funding of projects is not expected, but may be limited to projects meeting critical Agency needs, exemplary performance assessment, and which successfully re-compete in subsequent solicitations.

PROJECT BENEFIT TO OUTCOME (1, 2, OR 3)

All MSP goals and objectives are designed to support the Agency's Strategic Plan and the NASA Education goals, specifically, Education Outcome 1: Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals, through a portfolio of investments.

PROJECT ACCOMPLISHMENTS

In FY09, the following projects were implemented through MSP:

Pre-service Teacher Interactive Training (PSTIT): The PSTIT goal is to stimulate pre-service teachers' interest, knowledge, and confidence in developing new strategies for teaching an integrated, inquiry-based, STEM curriculum. There are two main components, each building

on and integral to the other: Interactive Training Seminars, which culminate in a series Challenge Competitions taking place at regional NASA Centers; and Summer Institute (at NASA Langley Research Center).

Achieving Competence in Computing, Engineering, and Space Science (ACCESS) :
ACCESS provides a 10-week paid internship at NASA centers around the United States. It is designed for undergraduate and graduate students with disabilities who have strong backgrounds in science and a desire to pursue technical careers. Undergraduate students are provided a stipend of $5,250 and the graduate students stipend is $6,000. In addition, travel expenses are paid, up to a $1000 allowance. There is a provision for assistive technology and other reasonable worksite accommodations.

New York City Research Initiative (NYCRI)
Teams consisting of a high school student, a high school teacher and an undergraduate are assigned to the principal investigators of NASA research projects. The NYCRI will consist of both summer research institute and an academic year component. NYCRI high school and college faculty will be required to formulate and implement NASA research based learning units in existing STEM courses. These courses and learning units will be used by partners to create a CIPAIR proposal for FY09.

Virginia State University (VSU)
The project objectives are to develop a strong university relationship with the NASA Langley Research Center and establish mechanisms for NASA professionals to provide input to VSU of "NASA skills" needed. The main technical objective is to develop and test energy conversion devices such as electromagnetic motors, inverters, solar cells, thermoelectric generators, and sensors, possibly enhancing their performance and efficiency by the implementation of nanomaterials. The need for alternative energy sources is expected to be met by the use of nano-scale semiconductors, ceramics, metals and composites. With the research work sponsored by this project, the academic curriculum can be expanded and the teaching and research components can be integrated, achieving some of the objectives of CIPAIR.

Sustaining Partnerships through Rapid Prototyping & Laser Scanning Technology (NTC)
The Navajo Technical College (NTC) curriculum development project will sustain the partnership between NTC and the National Center for Advanced Manufacturing (NCAM) and provide future interns, coop students, and employees skilled in the NASA mission critical areas of rapid prototyping, laser scanning and 3D modeling. Coupled with distance learning and the community of the Tribal College, this technology will be shared and used as a model for increasing STEM education with Tribal Colleges and Universities (TCU) who wish to participate. Dissemination through the DLN, conference presentations, invitational visits from other TCUs to NTC, and developing and sharing curriculum guides will be the focus of a subsequent proposal during FY 2009 for a follow-on MSP proposal or a CIPAIR proposal.

Science Teacher and Researcher Cluster (STAR)
The objective of this project is to provide an environment of real world scientific inquiry to pre-service teachers and engage them in inquiry-based methods as practiced by scientists in a discovery process. This will help produce student-centered, engaging teaching that science and mathematics teachers should be practicing in order to inspire today's children in STEM performance and careers. This project will establish a science teacher and researcher cluster at Ames, modeled after the NASA Science and Technical Institute (NSTI) project. Selected pre-service teachers from our minority affiliate institutions will spend a 10-week summer internship at Ames. The Ames Office of Education will leverage current NSTI infrastructure to facilitate

the management and integration of this pilot program for future consideration for TCUs, and access to NASA content from other clusters for development of supplemental curriculum for classroom use.

The three of the five new MSP projects are three year awards, with funding based on project performance and funds availability. One project was partially funded for one year, and one project requested funding for one year. The five new projects are:

- New Mexico State University (NMSU): *Promoting Access, Retention, & Interest in Astronomy*
- North Carolina Agricultural and Technical State University (NCA&TSU): *Integrating NASA Science, Technology and Research in Undergraduate Curriculum and Training*
- Florida A & M University (FAMU): *Minority Innovation Challenges Institute*
- Sistema Universitario (SU): *Engaging MSI STEM Students Through Space-Based Capstone Design*
- Crownpoint Institute of Technology/Navajo Technical College (NTC): *Laser Scanning for Digital Manufacturing*

PROJECT CONTRIBUTIONS TO PART MEASURES

The MSP mission is to provide key investments that will enhance the Agency's MUREP portfolio and thereby address critical areas within the Education Strategic Framework. MSP projects support Outcome 1 of the NASA education portfolio:

- **Outcome 1 (Higher Education):** Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goal through a portfolio of investments.

ACCESS supports 20 internships each year for students with disabilities who are seeking a STEM major. ACCESS is currently the only project in the NASA education portfolio directly serving disabled students.

The PreService Teacher Interactive Training project supported approximately 350 pre-service students and 50 faculty.

The other four MSP projects funded for implementation in FY09 have just finished their first year of implementation and metrics are currently being requested. Those projects were funded for one year only, to serve as pilot projects to enable them to compete for other NASA project funding.

Currently funded MSP projects will directly support Outcome 1 by contributing to the accomplishment of five of the six Higher Education PART metrics:

- Number of new or revised courses targeted at STEM skills needed by NASA that are developed with NASA support. (Project: NTC)
- Number of institutions served in designated EPSCoR states. (Project: NTC)
- Number of underrepresented and underserved students participating in NASA education programs. (Projects: ACCESS, PSTIT, NYCRI, VSU, NTC, STAR)
- Percentage of student participants employed by NASA, aerospace contractors, universities, & other educational institutions. (Projects: ACCESS, PSTIT, NYCRI, VSU, NTC, STAR)
- Percentage of undergraduate students who move on to advanced education in NASA related disciplines. (Projects: ACCESS, NYCRI, VSU, NTC, STAR)

IMPROVEMENTS MADE IN THE PAST YEAR

In FY09, MSP, received their full budget and was therefore able to conduct the first full external solicitation for project implementation in FY10. This solicitation was very successful, with 39 proposals received. Of those proposals, with additional funding, KSC was able to award five new grants. Sustainability as well as evaluation plans are considered and captured within all of the five new projects implemented in FY10. Dissemination of results or project work is also planned. The five new projects funded for implementation in FY10 offer a diverse blend of universities with projects that are cross cutting and enhance the Outcome 1 portfolio in the following ways: innovative methods, approaches, and/or concepts; total of 19 courses developed/enhanced (minimum); significant leveraging of NASA content and resources; serves pre-service teachers and STEM students; supports the involvement of MSIs in NASA sponsored challenges (current lack of MSI involvement is clearly evidenced). Projects will be closely monitored during implementation with a strict rigor of reporting and open communication. All new NASA reporting requirements have been communicated to the Principle Investigators and will also be closely monitored.

PROJECT PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

For FY09, the following is a list of project partners in the implementation of the MSP projects:

- PSTC: Principle Investigator: National Institute of Aerospace (NIA), serving as project director and coordinator. Conference Implementation: University of Maryland Eastern Shore (UMES), responsible for day-to-day tasks of conference planning and implementation.
- ACCESS: Principle Investigator: The American Association for the Advancement of Science (AAAS), responsible for student recruitment, selection, reasonable accommodations and stipend payment.
- NYCRI: Principle Investigator: Medgar Evers College of the City University of New York (CUNY), responsible for oversight of both the summer research institute and an academic year components.
- VSU: Principle Investigator: VSU, responsible for research and education activities to be performed at the NASA Langley Research Center as well as the University.
- Sustaining Partnerships through Rapid Prototyping & Laser Scanning Technology: Principle Investigator: The Navajo Technical College (NTC), overall responsibility of the curriculum development project.
- STAR: Principle Investigator: Cal State Fresno, responsible for student recruitment, application process, course credits and assessment/evaluation.