NASA Science and Technology Institute for Minority Institutions
Administered by United Negro College Fund Special Programs Corporation
Cooperative Agreement
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PROJECT DESCRIPTION

The NASA Science and Technology Institute for Minority Institutions (NSTI-MI) was established in 2006 to provide leading-edge research opportunities for faculty and students from MIs that complement NASA's research programs and make original contributions to NASA in astrobiology, biotechnology, information technology, emerging technologies, energy, environment research. The NSTI-MI brings together the talent and expertise of MIs to communicate, connect, and collaborate with the Federal government, private sector, one another, and other majority institutions and research and technical associations through the establishment of R&D collaborations and partnerships. By placing MIs within this nexus of business, industry and economic and transfer networks, NSTI-MI aims to: stimulate cross-disciplinary research; improve the transfer of information ideas and technology; promote the development of market-based technologies; foster technology management strategies that will move advances from scientific discovery to basic and applied technology; and establish educational frameworks and networks that will continue to expand the Nation’s talent base for research and development.

The Office of Education at ARC developed the concept of the NASA Science and Technology Institute for Minority Institutions (NSTI-MI) in response to the Center's development of the NASA Research Park (NRP). ARC's Office of Education believed strongly that the Minority Serving Institutions should be provided an opportunity for their faculty and students to conduct research with the NASA scientists and engineer, students and faculty from other NRP partner institutions, and Silicon Valley companies.

The NRP, located at NASA Ames Research Center in Silicon Valley, is a world-class, shared-use research and education campus for government, academia, non-profits and industry in support of NASA's mission. The NRP has over 40 companies and 12 universities collaborating onsite with NASA on education and a variety of research disciplines including information technology, nanotechnology, life sciences, biotechnology, space technology and space entrepreneurship.

The NSTI-MI is currently administered by the United Negro College Fund Special Programs Corporation (UNCFSP) and managed by ARC's Office of Education.

PROJECT GOALS

The purpose of the NSTI-MI is to provide support for minority institutions and to enable advancement of scientific research among their faculty and students. NSTI-MI will merge scientific discovery with the skill-sets traditionally located in the business disciplines. NSTI-MI will accomplish its goals through the formation of research clusters that include faculty, student and postdoctoral fellows and will collaborate with NASA scientist/engineers, other majority institutions and the private sector to engage in NASA-related research and development. NSTI is committed to developing fellows and employees for leadership positions. NSTI-MI research clusters provide excellent leadership opportunity for faculty from MI to lead research teams and assist member institutions in competing for new research grants and/or contracts. NSTI-MI will provide professional development training in R&D leadership and development, project management, business development, marketing and contract management. NSTI-MI is committed to STEM

workforce development. It provides internship; fellowship and mentoring opportunities for undergraduate and graduate students in NASA related programs and activities.

All NSTI-MI goals and objectives are designed to support the Agency Strategic Plan and Education goals. For instance, NSTI-MI will support one or more objectives under Education Outcomes 1, 2, and 3.

NSTI-MI will focus its efforts to meet the goals and objectives listed below. The parenthesis that follows each goal is a cross-reference to the appropriate Higher Education objective.

Goal 1: Link Minority institutions, industry, non-profits, and other entities through close association and alignment of research interests and expertise to create symbiotic partnerships (Supports HE Performance Outcomes 1 and 2)
Objectives

Goal 2: Channel R&D efforts toward the development of market-based concepts that can be leveraged for sustainability (Supports HE Performance Outcomes 2 and 3)
Objectives

Goal 3: Provide professional development, including research, business acumen, and leadership building expertise that will groom and prepare faculty, students, and others to be highly-skilled science and technology leaders and managers (Supports HE Performance Outcome 3)
Objectives

Goal 4: Work with Key Stakeholders to perform the following

- Students selected through a competitive application process to increase their STEM awareness and knowledge through individual experiential opportunities
- Faculty at Minority Institutions selected through competitive application processes to engage in collaborative research and increase their awareness and knowledge of NASA disciplines and missions.
- Minority Serving Institutions participating through competitive application processes to increase their research capability and capacity for competitiveness for mainstream research and development awards.

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

NASA Education Outcome 1 and Associated Objectives

Outcome 1: Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals, through a portfolio of investments.

1.1 Faculty and Research Support
Objective (employ): Provide NASA competency-building education and research opportunities for faculty, researchers, and post-doctoral fellows.

1.2 Student Support
Objective (educate): Provide NASA competency-building education and research opportunities to individuals to develop qualified undergraduate & graduate students who are prepared for employment in STEM disciplines at NASA, industry, & higher education.

1.3 Student Involvement Higher Education
Objective (educate): Provide opportunities for groups of post-secondary students to engage in authentic NASA-related mission–based R&D activities.

1.4 Course Development
Objective (educate): Develop NASA-related course resources for integration into STEM disciplines.

1.5 Targeted Institution Research and Academic Infrastructure

Objective (employ): Improve the ability of targeted institutions to compete for NASA research and development work.

PROJECT ACCOMPLISHMENTS

The goal for NSTI this fiscal year was to provide professional development, including research, business acumen, and leadership building expertise that will groom and prepare faculty, students, and others to be highly-skilled science and technology leaders and managers.

Several measurable outcomes were accomplished in 2008:

- In 2008 NSTI sponsored 13 graduate and undergraduate students through its Summer Scholars program
- 23% (3 of 13) of the 2008 cohort has been asked by their mentors to return to NASA next summer to continue their research.
- Students from the 2008 cohort effectively used the contacts created at NASA to network in their fields with professors located at other institutions.
- One of the NSTI students presented his research at the 37th Co-Spar Scientific Assembly held in Montreal, Canada
- NSTI provided professional training to our summer scholars that was thought to be of such value that other non NSTI interns at the AMES Research site attended
- Based on a report for the 2007 internship program, 100% of the interns felt that the NSTI-MI program provided them great internships that increased their understanding of how to pursue a STEM career.
- A majority of interns believe they developed critical research skills that they could apply when they return to school.
- 90% of the cohort 2 interns thought that the experience increased their interest in pursuing a career in their field of study.
- 100% of the undergraduate students in cohort 2 said that the internship increased their interest in attending graduate school in their field.

PROJECT CONTRIBUTIONS TO PART MEASURES

Total # participants reported FY08 (Cohorts 3): 13
Still in school: 13

1.3.1: Underserved and underrepresented student participation: 10

Total # participants reported FY07 (Cohorts 2): 10

1.3.1: Underserved and underrepresented student participation: 8

Total # participants reported FY06 (Cohorts 1): 21

Category	Cohort 1	Cohort 2	Cohort 3
Participants	**21**	**10**	**13**
Male	11	4	4
Female	10	6	9
Graduate	5	2	6

Undergraduate	16	8	7
Minority Institution	14	7	4
Majority Institution	7	3	9
Prior NASA	0	1	3

Gender	Cohort 1	Cohort 2	Cohort 3	Grand Total
Female	10	6	9	25
Male	11	4	4	19
Grand Total	21	10	13	44

Race/Ethnicity	Cohort 1	Cohort 2	Cohort 3	Grand Total
African American	14	5	5	24
Caucasian	2	2	3	7
Hispanic	4	1	4	9
Other	1	1	1	3
Other- Hispanic		1		1
Grand Total	21	10	13	44

Type Institution	Cohort 1	Cohort 2	Cohort 3	Grand Total
HBCU	12	4	2	18
HSI	2	3	2	7
Majority	7	3	9	19
Grand Total	21	10	13	44

Major Category	Cohort 1	Cohort 2	Cohort 3	Grand Total
Biology	4	1		5
Chemistry			2	2
Computer Science	3	2		5
Engineering	10	5	7	22
Math	1	1	2	4
Other	3	1	2	6
Grand Total	21	10	13	44

IMPROVEMENTS (e.g. project management, efficiencies, etc.) MADE IN THE PAST YEAR

Over the past year, the NSTI has worked to strengthen various components of the project.

1. NSTI hired a Program Coordinator dedicated to the Summer Scholars Program (SSP) that effectively facilitated the program and tracked the interns' progress.

2. Based on recommendations from previous participants, NSTI SSP developed and implemented a calendar of events. The calendar was distributed to all scholars during the orientation session. Updates to the calendar were distributed by the Program Coordinator 24-48 hours prior to the event.

3. The NSTI office extended its hours in order to provide time for SSP scholars to use office supplies and computers. The office also served as a gathering place for scholars, which allowed them to network with each other and foster the cohort community. Based on SSP scholar feedback, the scholars felt this gave them a sense of identity that was not immediately evident in interns from other summer programs.

4. Recruitment for the 2009 SSP will be targeted to schools within the clusters. This will enhance our efforts to increase the number of underrepresented students from minority institutions in the SSP.

5. The 2009 SSP applicants will be recruited based on the specific core competencies needed for the host cluster. All students will perform their training at the NASA center that hosts the cluster activities.

6. Graduate students will not be recruited for the 2009 SSP.

7. The SSP training curriculum was revised to include project management principles.

8. An emphasis on mentor retention occurred in FY 08. Thus, an official mentor guide was developed, and pre- and post-mentor surveys were conducted.

9. The NSTI weekly professional development sessions were promoted and offered to ALL of the 2008 summer interns at the NASA Ames Research Center.

10. Concurrence at the center and NASA Headquarters level was obtained for two NSTI research cluster teams.

11. Although plans were proposed to initiate outreach efforts in Year One, changes in project scope and reduced funding caused the outreach plans to be omitted. In lieu of the K-12 Outreach, summer faculty fellowships will be introduced to the NSTI Project in Year 3 (FY09).

12. Developed new program, called the NSTI Summer Faculty Fellowship Program. The FFP will target early stage tenure track Faculty members from STEM departments at Minority Institutions. Five FFP fellows will begin their tenure at the NASA Ames Research Center during the summer of 2009.

13. NSTI hired an Academic Manager who will assist with overall management of the project. The initial project for the incumbent manager will be to design and launch the Summer Faculty Fellowship Program in October 2008.

14. The search for a new Chief Research Officer for the NSTI Project began in FY08. The goal is to have the incumbent named by the end of 2008.

15. The NSTI cluster implementation process was revised, and is currently undergoing final review by the NSTI management team.

16. The NASA community is excited about the projected outcomes of the NSTI clusters, and other centers have expressed an interest in hosting additional clusters. A new goal of the NSTI project will be to add additional clusters to the pipeline in FY 09.

PROJECT PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

Summer Scholars Home Institutions

University of Puerto Rico
Olivet Nazarene University
Alcorn State University
Morgan State University
University of LaVerne
University of California Berkeley
University of Florida
Cochise College
Southern Unviversity and A&M College
Tuskegee University
University of Wisconsin - Milwaukee
University of Illinois at Chicago
Arizona State University
Polytechnic University
University of Puerto Rico-Rio Piedras
Claflin University
University of California Berkeley
University of Kansas
Pennsylvania College of Optometry
University of Puerto Rico-Rio Piedras
University of South Florida
San Jose State University

In the first funding year of the NSTI project, three NSTI Research Clusters were developed. The UNITE, UNEEC and UNIMET clusters each specialize in research disciplines that will help to make the Vision for Space Exploration a reality promote the advancement of space exploration. Each cluster is defined as:

UNCFSP-NSTI Information and Emerging Technologies Cluster (UNITE) will conduct Research that address pressing challenges in the areas of Supercomputing, Networking and Intelligent Systems. This Cluster will also engage in nano-scale research to support Aerospace and Thermal Protection Systems as well as human exploration of space. UNITE institutions are listed below:

Information and Emerging Technologies Trust (UNITE)-Ames
San Francisco State University
Texas Southern University
California State University- Fullerton
Southern University
Tuskegee University

UNCFSP-NSTI Mission Enabling Technologies Cluster (UNIMET) will conduct human exploration mission enabling research in the areas of Science Missions and Payloads, Bio-technology, Astrobiology, Human Factors, Advanced Life Support and Bio-nano-info fusion. UNIMET Institutions are listed below:

Mission Enabling Technologies Trust (UNIMET) -Johnson
Jackson State University
Texas Southern University
Savannah State University
Jarvis Christian College
Tougaloo College

UNCFSP-NSTI Energy and Environmental Cluster (UNEEC) will address energy and environmental issues as it relates to space travel and life on earth. UNEEC institutions are listed below:

Energy and Environmental Trust (UNEEC) -Glenn
Savannah State University
University of Texas at El Paso
Wilberforce University
Texas Southern University