

Mississippi Space Grant Consortium
Lead Institution: University of Mississippi
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Consortium URL: <http://ms.spacegrant.org//>
Grant Number: NNX15AH78H

LOB: NASA Internships, Fellowships, and Scholarships; Stem Engagement;
Institutional Engagement; Educator Professional Development

A. PROGRAM DESCRIPTION

The National Space Grant College and Fellowship Program consists of 52 state-based, university-led Space Grant Consortia in each of the 50 states plus the District of Columbia and the Commonwealth of Puerto Rico. Annually, each consortium receives funds to develop and implement student fellowships and scholarships programs; interdisciplinary space-related research infrastructure, education, and public service programs; and cooperative initiatives with industry, research laboratories, and state, local, and other governments. Space Grant operates at the intersection of NASA's interest as implemented by alignment with the Mission Directorates and the state's interests. Although it is primarily a higher education program, Space Grant programs encompass the entire length of the education pipeline, including elementary/secondary and informal education. The Mississippi Space Grant Consortium is a Designated Consortium funded at a level of Y2 base of \$400,000 and augmentation of \$360,000 for a total of \$760,000.

B. PROGRAM GOALS

The Mississippi Space Grant Consortium (MSSGC) has three major goals for FY2016-2017 as part of the 5-year Strategic Plan developed to support NASA in pursuit of their education goals and also to detail the Mississippi Space Grant Consortium mission. The MSSGC mission is to (1) be a gateway to science, technology, engineering and mathematics (STEM) careers and activities for students and programs throughout all levels of education; (2) enhance aerospace and aerospace-related research opportunities at undergraduate and graduate levels; (3) inspire STEM students to pursue STEM careers; (4) empower the state's general public and community leaders through contributions to scientific literacy; and (5) nurture innovation that is Mississippi centric and globally aware. The Mississippi Space Grant Consortium is a statewide network of sixteen MS Universities and Community Colleges; aerospace-related industries and public service institutions providing opportunities for Mississippians, especially those from underrepresented groups, to understand and participate in NASA's aeronautics and space program by supporting and enhancing science, technology, engineering and mathematics education, research and outreach programs. The three goals for MSSGC are: A. "Encourage" – Encourage and inspire students, particularly those from underrepresented groups, to pursue careers in Science, Technology, Engineering and Mathematics. Programs areas: Student support (scholarships, mentoring), Teacher training (Affiliate Workshops, Teacher Conference, Mini-Grants, K-12 Outreach (Fellowships, Hardware programs). B. "Enhance"-

Enhance and nurture a science-based workforce for Mississippi and the Nation. This support includes scholarships, fellowships, and internships with aerospace and aerospace-related industries and NASA Centers, as well as hands-on research experiences, and student rocket and balloon hardware programs. Program areas: Student support (scholarships, fellowships, student research opportunities), Internships (NASA, industry for student and community college faculty), Research & Engineering (Hardware programs, Research Infrastructure). C. "Enlighten" - Contribute to the general scientific literacy of the population. Program areas: Community outreach (Affiliate Programs); Public Relations (information dissemination, publicity, networking). MSSGC Objectives: Specific, Measurable, Appropriate, Realistic, Timely.

In support of Goal A "Encourage"; At the K-12 Level: A1. Seventy five percent of teachers participating in a MSSGC-sponsored event, such as the Teacher Workshop, will agree with the statement, "The material presented in the workshop will make me a more effective math/science teacher." A2. Seven out of eight teachers working with MSSGC Fellows will agree with the statement, "The fellow's presence in my classroom has inspired some of my students to pursue further study in the STEM fields who may otherwise have not." At the Community College/Undergraduate Level: A3. Eighty percent of undergraduate students participating in a MSSGC-sponsored program will agree with the statement, "This program has reinforced my desire to obtain a degree in math, science or engineering." A4. On average annually, 12 individuals will graduate with a STEM degree from MSSGC affiliates each year with the assistance of an MSSGC program and will either enter the aerospace-related workforce or will enter a graduate program in a STEM field. A5. Seventy five percent of students participating in MSSGC-sponsored mentoring programs will agree with the statement, "Participation in this program has helped me complete my STEM degree." At All Levels: A6. The diversity of the MSSGC-sponsored student awardees will meet or exceed the national percentages as determined by the most recent, publicly available data from the U.S. Department of Education's National Center for Education Statistics for a minimum of two of the following four categories: (1) students across all institutions, (2) racially or ethnically underrepresented students, (3) women, and (4) persons with disabilities. According to the most recent data from NCES, Mississippi leads the nation in the African American percentage of total fall enrollment in degree granting institutions. In support of Goal B "Enhance": B1. Each year, eighty percent of students participating in the MSSGC intern programs will agree with the statement, "My participation in this internship position has reinforced my desire to work for NASA or a NASA-related company." B2. At least one new significant (~\$100K/yr) contract or grant will be awarded each year to a MSSGC affiliate investigator based on work initiated with MSSGC funding. B3. Each year, seventy five percent of the students participating in a MSSGC funded Research and Engineering program will report they are more likely to pursue or to continue to pursue a STEM career. In support of Goal C "Enlighten" C1. Seventy five percent of participants at MSSGC-sponsored educational program will agree with the statement, "The material presented in his program has increased my awareness of current science or math issues." C2. Eighty percent of MSSGC affiliates will agree with the statement, "The MSSGC office has kept my campus abreast of relevant NASA and Space Grant opportunities and announcements."

C. PROGRAM/PROJECT BENEFITS TO PROGRAM AREAS

- The MSSGC Fellowship awardees must complete a K-12 outreach component. MSSGC Fellowship program continues with excellent evaluations from K-12 teachers. (NASA Program Area NIFS)
- NASA/MSSGC Students: Tracking comments: (NIFS students)
 - “The Mississippi Space Grant helped show me the importance of promoting STEM to young students. I remember the people who encouraged me to pursue a STEM career early in life, and it was very rewarding to help return the favor to the next generation of students. I really enjoyed helping out younger children and seeing the joy that STEM experiments brought them. It taught me better time management by requiring me to balance my graduate work while also preparing lessons to help out at a local school. I have also thought about becoming a professor later in my career, and this fellowship helped introduce me to teaching.” (Kyle Johnson, 2014 MSSGC Fellowship-Mississippi State, 2015 MSSGC Fellowship-Mississippi State)
 - “Participation in the MS Space Grant led to a career with the Naval Research Lab at Stennis Space Center.” (James Dickens, 2011 USM/Space Grant Scholarship-University of Southern Mississippi)
 - “It positively impacted both. The funding and award status significantly enhanced my education by allowing me to purchase needed equipment for my dissertation research as well as to establish professional ties with leading engineers in my field. The award also positively influenced my life through the K-12 outreach, allowing me to share my experiences and excitement for what I do with future engineers!” (Kenneth Moser, 2013 MSSGC Fellowship-Mississippi State, 2014 MSSGC Fellowship-Mississippi State, 2015 MSSGC Fellowship-Mississippi State)
 - “It gave me experience outside in a classroom in a team setting that helped prepare me for employment. The MS Space Grant helped develop me professionally in ways that I do not believe possible solely in a classroom setting.” (Clayton Mord, 2010 MSU Research Program-Mississippi State, 2012 NASA Center Internship/Marshall-NASA/Marshall, 2012 MSU Rocket Team-Mississippi State, 2012 NASA Center Internship/Marshall-NASA/MSFC)

D. PROGRAM ACCOMPLISHMENTS

The majority of Mississippi Space Grant's educational programs include fellowships, scholarships and internships, mentored research, Higher Education projects, K-12 Teacher workshops, and mini-grants related to Space Grant program objectives. Our public service are performed in conjunction with our affiliates' public programs at Meridian Community College and Itawamba Community College.

NASA Internships, Fellowships, and Scholarships:

MSSGC Goals A + B: Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals MSSGC FY16 (Base and augmentation) funded a total of 72 students: 50 scholarships and fellowships, 4 NASA Centers' Internships, and 12 HE students and 6 RI students. IES/US Department of Education stats: MS minority enrollment average is 43.3%; MSSGC NIFS

underrepresented % currently is 41.9% with 52% female; NOTE: this will be revised when reporting is complete and entered into OEPM.*

FY 2016 MSSGC goals A & B met; MSSGC objectives A.3, A.4, A.5, A.6, B.1, B.3 met.

*These percentages will be revised and reported into OEPM once the NASA Centers' and industry internship have been selected and the MUW, PRCC and USM awards are reported.

FY 2016-17 programs included:

1. MSSGC Graduate Research Fellowship Program

MSSGC awarded eight \$20,000 fellowships for the 2016-17 academic year. MSSGC Grant Fellows are also required to be a resource person to a teacher in one of their graduate institution's neighboring K-12 schools for ten hours per week. Each Fellow attended a one day training workshop at UM in August to provide guidance for K-12 instruction. The applicant also had to describe their graduate research project and how it relates to NASA interests.

2. Affiliates' Fellowship and Scholarship Programs:

- Alcorn State University: ASU funded ten scholarships.
- Itawamba Community College: ICC funded five scholarships.
- Meridian Community College: MCC funded two scholarships.
- Mississippi Delta Community College Scholarships: MDCC funded four scholarships.
- Mississippi State University: MSU funded twelve students in Aerospace Engineering, Rocket Team leaders and Astronautics.
- Mississippi University for Women Scholarship: Three scholarships were funded.
- Northeast Mississippi Community College Scholarship: Three scholarships were awarded.
- Pearl River Community College: PRCC funded five scholarships.
- University of Southern Mississippi Scholarship: USM funds ten scholarships for physics, mathematics or Computer Science students.

3. MSSGC funded NASA Centers' Internships: MSSGC funded 4 students: two to Ames and two to Marshall.

• Higher Education projects:

Delta State University: DSU funded one DSU faculty member to attend a professional conference designed to enhance current information on an emerging science or technology. Hinds Community College: HCC awarded two undergraduate students to serve as mentors for former and newly recruited participants in the Minority Science and Engineering Improvement Program. These students work closely with mathematics, science, and/or computer science instructors as project/classroom/laboratory assistants. The student mentors provide career choice information, tutoring and assistance with special assignments including science projects. Also, two HCC students were funded to present their research at the Emerging Researchers' National Conference in Washington D.C. March 2-4, 2017. Coahoma Community College: CCC funded 3 students who mentor and tutor other CCC students in math, science and/or computer science. Meridian Community College: MCC funded

a mentoring program, providing a stipend for a computer lab assistant. The student is available for MCC students who need tutoring in the areas of biology and chemistry. MCC also funded 2 faculty to attend the 2017 Mississippi Academy of Sciences Annual Conference in Hattiesburg, MS February 23-24, 2017. Mississippi Gulf Coast Community College: MGCCC funded students involved in the cooperative internship with the Gulf Coast Research Laboratory working with an instructor and a student centered project. Mississippi State University: MSSGC continues to fund the student-led rocket and balloon programs at MSU. Mississippi Valley State University: MVSU provided funds for ten students and two faculty members to engage in multiple workshop sessions aimed at the preparation of content knowledge inclusive of the content generally encompassing the Praxis II mathematics examination. Pearl River Community College: PRCC funded a collaborative project with the STEM Club for all students at PRCC, speakers for science lectures and conference presentations. PRCC also funded a teacher empowerment project in which teachers in the PRCC District attend local, state, and national workshops and conferences to gain new or revised teaching methods. University of Southern Mississippi: USM funded a spring "Innovative Computing Solution Competition." Students are encouraged to contact local businesses, medical and industrial communities for projects.

Industry and NASA Centers' Internships: Funding is being provided for 6 internships at Industry and NASA Centers. Selection of these students is currently in process.

- Research Infrastructure projects:
Affiliates' Research Infrastructure Programs: Delta State University, Jackson State University, MS University for Women, and MS State University funded small RI projects involving students.

- Precollege projects:
FY2016 MSSGC Goals 1 & 2 met; MSSGC objectives A.1, and A.2 met; FY2016 Programs included:

1. MSSGC Annual MSSGC Teachers Conference The workshop was held January 13 - 14, 2017 at the University of MS. Sixty-four middle school teachers attended, with speakers from the Consortium and its partners presenting topics in mathematics and science. Steve Culivan, NASA Educator from Stennis, conducted two of the science sessions. Yolanda Anderson and Seth Johnson, NASA Educators from Stennis, also conducted a science session. Evaluation of each speaker, as well as the entire workshop, was conducted. Overall, this workshop was evaluated as excellent by participants.

2. MSSGC Affiliates: MS State University: MSSGC funds are used for the MSU Space Grant scholars. MSU/Rocket Program: The "Space Cowboys" K-12 outreach component: This rocket team has reached over 1,000 middle school students by a variety of programs. Rocket team outreach activities included presentations and hands-on demonstrations at five middle schools. Additional MSU Space Grant/K-12 projects: MSU has funded five tours of the MSU engineering laboratories impacting about fifty high school students. Hands-on activities are included on these tours. Most of these high school students are underrepresented minorities. Pearl River Community College provided funds for the MCTM/PRCC Mathematics Competition held annually

on campus. Also, PRCC provided funding for area high school science teachers to attend local, state, and national conferences.

- Informal Education projects:
FY 2016 MSSGC goal 3 met; MSSGC objectives C.1 & C.2 met. FY 2016 programs included:

MSSGC Administrative Office: Increasing the dissemination of NASA and Space Grant activities and information is a continuing focus for the consortium's central office. Eric Day, on contract with the National Space Grant Foundation, serves as the MSSGC Webmaster. The task of dissemination is currently achieved through a variety of mechanisms including email distribution lists, a MSSGC Web page, and mailings. NASA announcements and opportunities, as well as other announcements applicable to our shared NASA/consortium goals, are routinely distributed via our email lists and MSSGC Web page. The consortium's Web site at <http://www.ms.spacegrant.org> is updated bi-monthly with consortium information, funding opportunities, conference and workshop announcements, and educational links, as well as numerous other links to science, math, and engineering information.

Itawamba Community College and Meridian Community College each funded a "Backyard Astronomy Program" presented by the Rainwater Observatory.

- ICC faculty member, Bob Swanson, was selected to be a part of the NASA Airborne Astronomy Ambassador Program and flew on the SOPHIA flight in March 2017. He is the first Mississippian to ever be selected for the program.

E. PROGRAM CONTRIBUTIONS TO NASA EDUCATION PERFORMANCE GOALS

- **Diversity:** Diversity is a priority of the MSSGC and a topic on agendas for the Campus Coordinators Meetings. The MSSGC consists of 16 affiliates; each campus has a MSSGC Campus Coordinator. The diversity breakdown of the MSSGC Campus Coordinators is 10 males, 6 females; 5 African American, 9 Caucasian, 1 Native American and 1 other. All public HBCUs and the one public university in the state historically for women are MSSGC affiliates. Their activities are described in Section D. Benchmarks for diversity for students' awards have historically been met by the MSSGC.
- **Minority Serving Institutions Collaborations:** All five public Mississippi HBCUs are an active part of the MSSGC. MSSGC has also partnered with the two private Mississippi HBCUs in the state: Rust College and Tougaloo College (both have been recipients of RI awards in previous years).
- **Office of Education Annual Performance Indicators:** Provide numerical values for consortium contributions to API's.
 - APIED-15-1 22 (Number of NIFS to racially or ethnically underrepresented students, women, and persons with disabilities.)
 - APIED-15-2 64 (Number of educators.)
 - APIED-15-4 4 (Number of informal education events.)
 - APIED-15-5 1500 (indirect) (Number of K-12 students.)

F. IMPROVEMENTS MADE IN THE PAST YEAR

- Jones County Junior College is coming onboard as a SG affiliate increasing the number of institutions in the consortium to seventeen. The official paperwork is in the process of being finalized.
- Following Margaret Schaff leaving the Space Grant Administrative Office, Dr. Earnest Stephens filled the position of Project Coordinator.

G. CURRENT AND PROJECTED CHALLENGES

- Total Eclipse Project: This project has developed into a major interconnected national space grant project. Funding and logistics is a current and projected challenge but the commitments from the MS State University High Altitude Balloon Team and MSSGC is firm.
- Cost Share: Cost Share has become a challenge at many of the MSSGC Community College Affiliates. Campus Coordinators struggle to obtain cost-share at their institutions. MSSGC is working with each Campus Coordinator to accurately document their time coordinating their space grant activities as cost share.

H. PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

Academic Affiliates

The University of Mississippi (UM): Public PhD degree-granting research university and lead institution for the NASA Space Grant Program. Dr. Nathan Murray is a Research Scientist II, Aeroacoustics, National Center for Physical Acoustics and a Research Assistant Professor of Mechanical Engineering and serves as the Director of the MSSGC and UM/MSSGC Campus Coordinator.

The University of Southern Mississippi (USM): Public PhD degree-granting research university. Dr. Douglas Masterson, Associate Dean for Undergraduate Affairs, College of Science and Technology and is the MSSGC Campus Coordinator.

Mississippi State University (MSU): Public PhD degree-granting research university. Dr. Keith Koenig is a Professor of Aerospace Engineering and the MSSGC Campus Coordinator.

Jackson State University (JSU/HBCU): Public PhD degree-granting research university. Dr. Maria Begonia is a Professor of Biology and the MSSGC Campus Coordinator.

Alcorn State University (ASU/HBCU): Public degree-granting university. Dr. Montgomery-Richardson, Chemistry Assistant Professor is the MSSGC Campus Coordinator.

Delta State University (DSU): Public PhD degree-granting university. Dr. Charles Smithhart is a Professor in the Dept. of Biological and Physical Sciences and is the MSSGC Campus Coordinator.

Mississippi University for Women (MUW): Public degree-grant university. Dr. Joshua Hanes is a Mathematics Professor and is the MSSGC Campus Coordinator.

Mississippi Valley State University (MVSU/HBCU): Public degree-grant university. Dr. Raymond Williams is a Mathematics Professor and is the MSSGC Campus Coordinator.

Coahoma Community College (CCC/HBCU): Associate degree-granting community college. Angela Reynolds is an Instructor in the Department of Math, Science and Computer Science and is the MSSGC Campus Coordinator.

Hinds Community College (HCC/HBCU): Associate degree-granting community college. Dr. Mitchell M. Shears is the Academic Dean and is the MSSGC Campus Coordinator.

Itawamba Community College (ICC): Associate degree-granting community college. Dr. Betsy Chesnutt is a Physics and Engineering Instructor and the MSSGC Campus Coordinator.

Meridian Community College (MCC): Associate degree-granting community college. Dr. Angela Carraway is a Chemistry Instructor and the MSSGC Campus Coordinator.

Mississippi Delta Community College (MDCC/HBCU): Associate degree-granting community college. Amy Biles is a Physical Science Instructor and the MSSGC Campus Coordinator.

Mississippi Gulf Coast Community College (MGCCC): Associate degree-granting community college. Mr. Steve Manis is a Science Instructor and the MSSGC Campus Coordinator.

Northeast Mississippi Community College (NEMCC): Associate degree-granting community college. Mr. Patrick Eaton is the Development Officer and is the MSSGC Campus Coordinator.

Pearl River Community College (PRCC): Associate degree-granting community college. Dr. Karen Bond is the Director of Institutional Effectiveness and the MSSGC Campus Coordinator.

Industrial Partners: NVision Solutions, Inc., Lockheed Martin Space Systems Company, LogLinear Group, LLC, Radiance, Inc., Innovative Imaging and Research

Government Partners: NASA/Stennis Space Center, NASA/Johnson Space Center, NASA/Marshall Flight Space Center, NASA/Langley, NASA/Glenn, NASA/Ames, Jet Propulsion Laboratory, NASA/ Kennedy Space Center

Educational Partners: Rainwater Astronomy and Planetarium, UM/Center for Math and Science Education, Enterprise for Innovative Geospatial Solutions (EIGS), Mississippi Science Teachers Association, Rust College (private HBCU), Tougaloo College (private HBCU)