

Mississippi Space Grant Consortium
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URL: <http://www.olemiss.edu/programs/nasa/>

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 Consortium is a Designated Program Grant funded at a level of **\$730,000** for fiscal year 2008.

PROGRAM GOALS

Scholarship/Fellowship* Goals: As stated in the MSSGC Strategic Plan, Mission #2 is to "Enhance aerospace-related research opportunities at the undergraduate and graduate levels" and following this mission statement is MSSGC Goal #1 to increase research opportunities for undergraduate students. **Objectives:** MSSGC will continue to offer competitive fellowships and scholarships that provide research and education opportunities to students from a diverse population in the STEM areas and continue to communicate opportunities of scholarships, fellowships and student research opportunities available through NASA.

Research Infrastructure* Goals: As stated in Mission 2 of the MSSGC Strategic Plan, RI goals are to "Enhance Aerospace-related research opportunities at the undergraduate and graduate levels" with Goal (1) to increase research opportunities for undergraduate students, and Goal (2) to increase research opportunities for graduate students and Goal (3) to establish research opportunities with local aerospace-related industries. **Objectives:** Support new and developing research, especially multidisciplinary and collaborative projects, in fields aligned with NASA's research needs, and to promote research collaborations with industry.

Higher Education* Goals: As stated in the MSSGC Strategic Plan, Mission #3 is to "Inspire students, especially those from underrepresented groups, to pursue aerospace and aerospace-related careers" and following this mission statement is MSSGC Goal #2: is to foster and nurture MSSGC, aerospace-related industry, and NASA Center partnerships to address workforce issues. **Objectives:** Enhance faculty and undergraduate/graduate student development through internships and fellowships at NASA Centers; encourage the participation of underrepresented groups in all MSSGC/HE Programs; encourage collaboration between institutions of higher learning; maintain mentoring programs that serve to strengthen STEM Higher Education in MS.

K-12 Goals: As stated in the MSSGC Strategic Plan, Mission #4 is to "improve the state's scientific literacy by providing K-12 educators with innovative strategies for teaching math and science" and under this mission statement is Goal #2: Supplement innovative teaching and learning experiences by expanding the mini-grant program. **Objectives:** Encourage programs that inspire and motivate students, particularly underrepresented groups to pursue STEM careers; facilitate partnerships for mini-grant applications that strengthen K-12 STEM education; encourage K-12 teacher training for teaching the STEM subjects; and to support programs that promote "hands-on" experiences in the STEM fields.

General Public Goals: As stated in the MSSGC Strategic Plan, Mission #5 is to "support programs contributing to scientific literacy for the general public." **Objectives:** To support activities of scientific discovery opened to the public and evaluate methods to document, access, and measure the impact of the public service programs funded.

Administrations/External Relations Goals: To ensure quality, diversity and full and fair participation in all the MSSGC programs and to be in alignment with the needs of NASA, as outlined in the NASA FY 2006 Education Goals and Outcomes, the NASA Vision of Space Exploration, and the NASA Human Capital Management Plan, and the needs of MSSGC affiliate organizations and the state of Mississippi. **Objectives:** MSSGC will provide timely

reporting to NASA Headquarters, and maintain and expand relationships with NASA Centers. MSSGC will also represent the diverse interests and resources of the member affiliates and institutions and ensure programs are aligned with NASA and the state of Mississippi priorities. MSSGC will continue to ensure diversity in all MSSGC programs and will continually monitor and seek ways to improve the quality and effectiveness of all programs.

***S/F, RI, and HE Programs will meet or exceed 39.3%.**

(IES/US Dept of Education 2005 stats MS minority enrollment average of 42%: includes 38.4 Black, .7 Hispanic, .8 Asian, .5 Am Indian and 2.7 Non-resident.)

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

The majority of Mississippi Space Grant's educational outreach includes scholarships and fellowships, mentored research, Higher Education projects (Outcome 1), K-12 Teacher workshops, and mini-grants (Outcome 2), related to Space Grant program objectives. Our public service programs (Outcome 3) have been performed in conjunction with Rainwater Observatory and Planetarium. All of the affiliates' educational programs, K-12 through higher education, are in alignment with state educational standards.

The distribution of NASA funds within the Mississippi Space Grant Consortium for May 1, 2008- April 30, 2009:

Total: \$730,000

Research Infrastructure: 24.0%

General Public: 1%

Higher Education: 24.8%

External Relations: 0%

K-12: 9.6%

Consortium Admin: 8.9%

Scholarships/Fellowships: 31.7%

PROGRAM ACCOMPLISHMENTS

Outcome #1: Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals (Employ and Educate)
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Goals and objectives met.

FY 2008 programs included:

MSSGC Workforce Development Program (Higher Education)

The Mississippi Space Grant Consortium (MSSGC) implemented a workforce development program in 2003, expanded the program in 2004, and continued it in 2005, 2006, 2007 and 2008. This highly successful program is comprised of a student internship and a community college fellowship program. The MSSGC established partnerships with aerospace-related industries in Mississippi and with NASA Stennis, Marshall and Kennedy Space Centers that provided ten-week internships for six undergraduate students. The eight student interns were competitively selected by the partnering companies from the MSSGC's eight affiliate universities. MSSGC received 26 student intern applications and forwarded these applications to the sponsoring companies for selection. Companies participating were Lockheed Martin, NVision, and Radiance.

Scholarship and Fellowship Program

A. MSSGC Fellowship Program

MSSGC awarded seven \$17,000 fellowships for the 08-09 academic year. These fellowships may be renewed for up to three years, and support graduate students enrolled at a Mississippi university pursuing any field of graduate study (Masters or Doctoral level) relevant to NASA. MSSGC Grant Fellows are 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. Rather than develop teaching modules, the Fellows used already developed materials from the wide variety available through NASA and the NSF-sponsored North Mississippi GK-8 program. Each Fellow attended a one day training workshop at UM in July to learn teaching guidance for K-12 students. The applicant also had to describe their graduate research project and how it relates to NASA interests.

B. MSSGC Community College Graduate Program

MSSGC offered (10) awards at \$3,000 each to Community College graduates to complete their STEM degree at a four year MSSGC affiliate university. Awards were for \$750 per semester for up to 4 semesters, provided the student makes satisfactory progress toward a degree in the approved subject area.

C. Affiliates' Fellowship and Scholarship Programs

- Alcorn State University -Scholarship: ASU funded ten scholarships to support graduate and undergraduate science majors by awarding fellowships and scholarships for tuition and school expenses.

- Itawamba Community College- Scholarship: ICC funded three student scholarships. Awardees were assigned to work with ICC faculty, and also serve as mentors for STEM students.
- Jackson State University- Scholarships/Fellowships: JSU funded three scholarships and one fellowship.
- Mississippi State University- Fellowship: MSU awarded one fellowship in engineering.
- Mississippi University for Women- Scholarship: Three scholarship awardees are selected by a STEM committee and are required to pursue research at MUW or a host institution.
- Northwest Mississippi Community College- Scholarship: Two awardees selected by NMCC STEM faculty and are required to be laboratory assistants to help all STEM faculty.
- The University of Mississippi- Scholarship: UM funded one student to work on the research project.
- University of Southern Mississippi- Scholarship: USM funds one scholarship for a physics, mathematics or Computer Science student. The student is selected by faculty from these three areas.

Research Infrastructure Program

A. MSSGC Infrastructure Program

The Call for Proposals was initiated November, 2008 and ten proposals were received. The MSSGC Review Panel selected four projects in December, 2008. Preference was given to projects that related to NASA’s research needs, had a strong interdisciplinary team, included new faculty and directly involved students.

B. Affiliates’ Research Infrastructure Programs

- Jackson State University- Research Infrastructure: Funds were provided for the research component of the scholarship/fellowship research projects. Some of this amount was used to partially fund travel to scientific meetings to present project papers.
- Mississippi State University- Research Infrastructure: MSU has funded two research infrastructure projects: Supersonic Wind Tunnel research and Sports Engineering/Engineering Materials. Each project provides a stipend for the undergraduate and graduate students working on their research as well as travel funds to present their projects as scientific meeting.
- Mississippi University for Women- Research Infrastructure: MUW funds two faculty research projects and results of the research projects are presented and/or published at professional conferences.
- The University of Mississippi- Research Infrastructure: UM funded one RI project: Dr. Ellen Lackey + Dr. Elliott Hutchcraft/Project: “Measurement of Dielectric Properties of Lunar Soil Simulant.” (NASA Marshall)
- University of Southern Mississippi- Research Infrastructure: USM funded 5 undergraduate students to work and train on methods of scientific and engineering modeling, simulation, and visualization. The High Performance Visualization Lab at USM was created through the collaborative efforts and funding of the US Navy, US Army and several academic units from the College of Science and Technology. This project was designed to create and maintain a basic knowledge foundation in the lab.

Outcome #2: Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty (Educate and Engage)

Program goals and objectives met.

FY08 Programs included:

1. MSSGC Programs: (K-12)

A. MSSGC Annual MSSGC Teachers Conference The workshop was held January 23 and 24, 2009 at the University of MS. Over 65 middle school teachers attended with speakers from the Consortium and its partners presenting topics in mathematics and science.

B. MSSGC Minigrants:*

- Provine High School: Robotics Team- In this project, Provine High School students design and build a radio-controlled robot that competes in the F.I.R.S.T. Robotics Competition. The members of the Provine Robotics team are all minority students.
- Tupelo High School: This project included high school student science lectures, research activities, mentoring program.
- Rainwater Observatory- NASA funds: Projects funded are four teacher workshops: two Backyard Astronomy workshops Hands-On Astronomy workshop, and Astronomy to Classroom workshop.
- Southeast Elementary School- NASA funding: This summer mathematics camp targeted 2nd – 4th grade students and focused on challenging hands-on functional activities.

2. Affiliate Programs/ Higher Education and K-12:

- Hinds Community College- Higher Ed/K-12: HCC awards (2) undergraduate students to serve as mentors for former participants in the Minority Science and Engineering Improvement Program and for newly recruited participants.
- Itawamba Community College- Higher Education: ICC funded a student assistant to support science faculty in the development of videos, software, on-line instructional materials and serve as a tutor for science students.
- Jackson State University- K-12: Funds were provided for a workshop for K-12 teachers in the Jackson area for a three day workshop on how to conduct scientific experiments.
- Meridian Community College- Higher Education: MCC funded a mentoring program, providing a stipend for a computer lab assistant.
- Mississippi Delta Community College- Higher Education: Two students were funded to serve as math and science tutors for 2 hours a week for fall and spring semesters in the Center of Learning on campus.
- Mississippi State University- Higher Ed: MSU has funded the University Student Launch Initiative: two student teams designed and built rockets and will participate in the competitive launch at NASA/Marshall and the AIAA Southeastern Region Student Conference. K-12: MSU funds a dedicated science lab for the local public school/3rd grades. MSU also funds tours of the MSU engineering laboratories for approximately 200 local high school students. Hands-on activities are included on these tours.
- Mississippi University for Women- Higher Education: MUW funds STEM faculty to accompany selected sophomores, juniors, and seniors (based on GPA) to the Mississippi Academy of Science annual meeting and the Mathematical Association of America Louisiana/Mississippi sectional meeting.
- Mississippi Valley State University- Higher Ed: MVSU provided funds for four students and two faculty members to conduct research on student achievement in the local schools in Leflore County (95% underrepresented minorities) and to establish baseline data for placement of MVSU students in college mathematics courses.
- Pearl River Community College- Higher Ed: PRCC funds a collaborative project with the Alpha Omega Science Club and for all students at PRCC, speakers for science lectures and conference presentations. K-12: PRCC/SG provides funds for the MCTM/PRCC Mathematics Competition held annually on campus. Also, PRCC/SG funds two area high school science teachers to attend NASA workshops.
- University of Southern Mississippi- Higher Education: USM funds a spring “Innovative Computing Solution Competition.” Students are encouraged to contact local businesses, medical and industrial communities for projects.

Outcome #3: Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA’s mission (Engage and Inspire)

Program Goals and Objectives met.

FY 2008 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. A part-time graduate student is employed as the MSSGC Webmaster. The task of dissemination is currently achieved through a variety of mechanisms including email distribution lists, a World Wide 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 Web page. The consortium’s Web site at <http://www.olemiss.edu/programs/nasa/> 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.
- Rainwater Observatory and Planetarium- Through the MSSGC Mini-grant program, the Rainwater Observatory and Planetarium received four awards for workshops. These workshops are open to the public, although many are designed for K-12 teachers. The director of the Rainwater Observatory is Mississippi’s Solar System Educator, Mr. Jim Hill. (See MSSGC K-12 programs in Outcome 2 for descriptions of the four workshops.)
- Itawamba Community College and Meridian Community College- General Public: ICC and MCC each funds a “Backyard Astronomy Program” presented by Jim Hill, Director from the Rainwater Observatory and Planetarium, Mississippi’s Solar System Educator, schedule for the ICC and MCC campus April, 2008. The programs are opened to the public and include advertising, and evaluating the event. STEM ICC and MCC students will volunteer to help host the event.
- Pearl River Community College- General Public/ Higher Education: PRCC/SG in collaboration with the Alpha Omega Science Club provides speaker stipends for guest scientific lecturers. The collaboration hosts several

lectures by scientists in different areas whose expertise capture the interest of the student population and expand their horizons. It gives science majors the opportunity to hear from current, informed leaders in their own fields of study; non-science majors would be able to relate developments in science and technology to their own disciplines. The general public was also invited to the lecture series.

PROGRAM CONTRIBUTIONS TO PART MEASURES

- Longitudinal Tracking: MSSGC began tracking students that have received \$3,000 or over in NASA/MSSGC funds since 2006. MSSGC contracts with the National Space Grant Foundation for this service. Due to delay of receiving FY08 funds, as of the submission of this report no students have been identified as having been significantly supported from FY08 funds. The progress of students who are identified as being significantly supported from FY08 funds after the submission of this report will be included in the FY09 progress report. For all students that were significantly supported in the period spanning FY06-FY08, 3 students graduated and are pursuing advanced STEM degrees, 4 students accepted STEM positions in industry, and 1 went to work in a non-STEM position. The remaining students have not yet received the degree that they were pursuing while they received their Space Grant award.
- Course Development: (None other than the 2 new Aerospace Design Courses at MSU funded with ESMD funds.) Of potential course development: two Systems Engineering Faculty from MSU did attend the University of Texas/TX Space Grant Consortium workshop for Systems Engineering.
- Matching Funds: \$550,301 matching funds for FY08.
- Minority-Serving Institutions: All five public Mississippi HBCU's are an active part of the MSSGC. MSSGC has also partnered with the two private Mississippi HBCU's in the state. Percentage of awards FY08 to underrepresented students is 41.86%.

IMPROVEMENTS MADE IN THE PAST YEAR

- Campus Coordinator sub-committee developed to work on re-writing the Strategic Plan this summer; Industry/Education members to be added. The new Strategic Plan will be implemented May 2010 – April 2014.
- Increased # of MSSGC Fellowships (+applications).
- Closer partnership with the MS Center for Mathematics and Science Education.
- Increased MSSGC RI projects (4) funding.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION*

*(Role of affiliates and partners as described in the section "Program Accomplishments")

Academic Affiliates

Comprehensive Universities

The University of Mississippi (UM); The University of Southern Mississippi (USM); Mississippi State University (MSU); Jackson State University (JSU/HBCU)

Regional Universities

Alcorn State University (ASU/HBCU); Delta State University (DSU); Mississippi University for Women (MUW); Mississippi Valley State University (MVSU/HBCU)

Community Colleges

Coahoma Community College (CCC/HBCU); Hinds Community College (HCC/HBCU); Itawamba Community College (ICC); Meridian Community College (MCC); Mississippi Delta Community College (MDCC); Mississippi Gulf Coast Community College (MGCCC); Northeast Mississippi Community College (NEMCC); Pearl River Community College (PRCC)

Industrial Partners

Alliant (ATK) TechSystems; NVision Solutions, Inc. ; Lockheed Martin Space Systems Company; Planning Systems, Inc (PSI); Radiance, Inc.

Government Partners

NASA Stennis Space Center; NASA Marshall Flight Space Center; Jet Propulsion Laboratory; NASA Kennedy Space Center; NASA Ames

Educational Partners

Rainwater Astronomy and Planetarium ; Enterprise for Innovative Geospatial Solutions (EIGS); Mississippi Science Teachers Association; Mississippi Educational Broadcasting; Rust College (private HBCU); Tougaloo College (private HBCU).