

# **Louisiana Space Consortium**

## **Louisiana State University**

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#### **AFFILIATE MEMBERS**

Consortium members include colleges/universities, HBCU's, business/industry partners, state education boards, non profit organizations, and state/local government structured as Sustaining Members (SM), Regular Members (RM), and Affiliate Members (AM).

- Louisiana State University (SM)
- Southern University and A & M College (SM)
- University of New Orleans (SM)
- Louisiana Tech University (SM)
- University of Louisiana at Lafayette (SM)
- Louisiana Board of Regents (SM)
- Lockheed Martin Michoud Operations (SM)
- Northwestern State University of Louisiana (RM)
- University of Louisiana at Monroe (RM)
- Southeastern Louisiana University (RM)
- Southern University of New Orleans (RM)
- McNeese State University (RM)
- Loyola University (RM)
- Xavier University of Louisiana (RM)
- Tulane University (RM)
- Nicholls State University (RM)
- Louisiana Business and Technology Center (RM)
- Louisiana Board of Elementary & Secondary Education (RM)
- East Baton Rouge Parish Recreation & Park Commission Highland Road Park Observatory (RM)
- Dillard University (AM)
- Grambling State University (AM)
- Sci-Port Discovery Center (AM)
- LSU Agricultural Center (AM)

#### **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, 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 Louisiana Space Consortium is a Designated

Consortium funded at a level of \$590,000. for fiscal year 2007. Louisiana is also a NASA EPSCoR state.

### **PROGRAM RELEVANCE TO NASA**

Space Grant consortia build human capital and research expertise to support NASA programs and missions, expand NASA's expertise and educational networks, and bring knowledge and awareness of space to a broad range of constituents in every state. The Louisiana Space Consortium, a NASA National Space Grant College and Fellowship Program in conjunction with The Louisiana Board of Regents, supports the U. S. President's *Vision for Space Exploration* through programs of Research, Graduate Fellowships, Workforce Development, and Pre-College Educational and Public Outreach to strengthen the Science, Technology, Engineering, and Math (STEM) education for a diverse technical workforce, and to develop the research and economic infrastructure to make a difference in research and education and to boost Louisiana's contribution to the aerospace "frontier." With our affiliates, we implement our sub-programs according to SMART Goals & Objectives correlated to NASA's Education Outcomes to INSPIRE, ENGAGE, EDUCATE AND EMPLOY as depicted in the NASA Education Portfolio Strategic Framework.

### **PROGRAM BENEFITS TO THE STATE**

The LaSPACE Mission is: *To enhance Space and Aerospace related research, education, and public awareness throughout the state of Louisiana, and thereby promote math and science education, training of professionals, and economic development.* One of LaSPACE's main tasks is to focus on the development of R & D and the corresponding human resources in Louisiana. In particular, developing information and opportunities for R & D are crucial impacts, as are contacts with the NASA field centers and developing liaisons for LA researchers, to build research competitiveness. **The Research programs prepares faculty researchers for the challenges of the aerospace field, with an added benefit of involving students in meaningful research experiences, prompting some to continue to graduate school.** Additionally, Space Grant provides support for students to earn degrees, engage in research experiences, visit NASA facilities, and interact with faculty and NASA researchers. Program participants have joined Louisiana universities as faculty, gone on to graduate school or medical school, or to work in the Louisiana workforce. More than 1000 classroom teachers have been supported in professional development to enhance classroom education.

### **PROGRAM GOALS**

Our major Strategic Directions as outlined in our Strategic Plan and consistent with the Space Grant enabling legislation, are (a) development of research capabilities, (b) education at all levels directed at workforce development, and (c) outreach. Thus, LaSPACE has developed sub-programs for (i) research awards (ii) graduate student fellowships, (iii) graduate research assistance, (iv) unsolicited K-12 education/outreach, (v) unsolicited research development, (vi) NASA Academies and internships, (vii) student research teams, and (viii) undergraduate research assistantships. Executing our Strategic Goals is accomplished through setting and working toward Implementation Goals that are thoughtfully crafted, sufficiently specified in objectives, evaluated through tangible metrics, and organized by NASA Education Outcome.

NASA Education Outcome 1: Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals (Employ & Educate)

Implementation Goal 1: Engage in University Education Sub-Programs

Implementation Goal 2: Conduct Research and Development Infrastructure Projects

Implementation Goal 3: Conduct Workforce Development Sub-Programs

Implementation Goal 4: Engage in External Relations

Louisiana Outcome 1: Interface With Statewide Interests to Promote the Aerospace Industry in Louisiana

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

Implementation Goal 5: Conduct Outreach Beyond Academia

NASA Education Outcome 3: Build strategic partnerships/ linkages between STEM formal/informal education providers that promote STEM literacy/ awareness of NASA's mission (Engage & Inspire)

Louisiana Outcome 2: Operate Effectively

Implementation Goal 6: Promote Diversity

Implementation Goal 7: Practice Effective Grant Management

## **PROGRAM ACCOMPLISHMENTS**

Research Infrastructure: Over the life of the Louisiana Space Grant Program, and in support of NASA Education Outcome 1, our Research Enhancement Awards and Unsolicited Research

Underlying each Goal is the imperative for increased diversity.

Proposals programs have supported 138 projects at 14 institutions, with a total investment of approximately \$2.22M (in mostly LA Board of Regents funds) and has generated approximately \$2.23M in institutional commitments. More than half of the projects involved some type of collaboration with a NASA Center, and almost all involved students. One successful emerging researcher is a B-52 Commander in the Air Force Reserves, based at Barksdale Air Force in Shreveport!

For FY07, four REA awards were granted at \$128,638. and an institutional commitment of \$103,054. In the post-Hurricanes Katrina and Rita environment, we introduced the Research Renewal Awards Program. To foster more minority participation and infrastructure development, we piloted the RIG (Research Initiation Grants) Program with a Small College and Minority College focus. Both programs require special attention to recruitment.

Public and K-12 Outreach: In support of NASA Education Outcomes 1 and 2, our Educational Outreach efforts focus on teacher training and student hands-on experiences, and meet state and

national education standards. In 2007, we facilitated FIRST Robotics funding for 13 schools across the hurricane-impacted Gulf Coast, including the Choctaw Indian Tribe and other schools in Mississippi.

We interface with the Louisiana NASA Explorer Schools, particularly by providing funding for missions at the Challenger Center. We reached out to military students and families. We collaborated with several informal science education groups such as StarDate radio broadcasts, with the Mobile Astronomy Resource System (MARS) travel van and the Baton Rouge Highland Road Park Observatory. We continued support to the Experiment Gallery at LaTech where thousands of students and dozens of in-service and pre-service teachers engage in science activities. We made a space program presentation to the Air Force Junior ROTC cadets at the 2007 Summer Leadership School.

In 2007, we were delighted to add a new affiliate, SciPort Discovery Center, in Shreveport. This outstanding, state-of-the-art hands-on educational center and IMAX theater boasts the world's first open planetarium. Pre- and in-service teacher education is a major component as well.

Programmatic Activities: We effectively manage program funds from NASA and the Board of Regents, with all awards issued via subcontract. We attend meetings, collaborate with and support other Space Grant states, and report to NASA as well as the state. We were pleased to co-host the Southeast Regional Meeting (with Mississippi) in Shreveport in September 2007.

Diversity: As a reflection of new approaches to bringing NASA programs to the most widely diverse audience, we conduct our new MRS and GSRA student programs, and promote the Research Initiation Grants (RIG) (with (a) minority focus and (b) small college focus). Program Manager Johnson attended a Diversity Workshop at the Lunar and Planetary Institute (LPI) in Houston in early 2007. Lessons learned there continue to guide our Diversity Strategy.

## **STUDENT ACCOMPLISHMENTS**

Student Research (Individual Awards): In support of NASA Education Outcome 1.2, we conduct our Graduate Student Fellowship sub-program and LaSPACE Undergraduate Student Research Assistantship sub-program (LURA). Eight Fellows continued their studies at the beginning of 2007. One expended his multi-year eligibility in 2007, but plans to graduate in 2008. One dropped out of school while another dropped out of the Ph.D. program after earning a Masters. A third graduated with a Ph.D. The LURA sub-program involved 15 students in 8 student teams at two schools for the 2006-07 school year. For the 2007-08 school year, 10 students on 9 teams at three schools were engaged in mentored research.

We initiated the Graduate Student Research Assistance (GSRA) sub-program in 2006 (with special conditions for students impacted by the hurricanes). This sub-program proved to be very popular, with 13 awards (4 receiving the additional \$1K hurricane allowance) for the 2006-2007 year, and ten students receiving GSRA awards for AY2007-08.

Since the GSRA was introduced in 2005, twenty-three awards have been made; nineteen to Ph.D. candidates and four to M.S. candidates. Nineteen are males; one is African-American. **The GSRA program is enhancing the graduate experience and working as a retention tool.**

Working toward our Diversity Goal, the new Minority Research Scholars (MRS) sub-program had the first awardee in 2007, a Hispanic mother of three, who, unfortunately, dropped out of school in late 2007. A second awardee (in 2008) is an African-American female, who was in the U. S. Marine Corps.

Student Research Teams: In support of NASA Education Outcome 1.3, the student built BalloonSat sub-program, LaACES (our major workforce development project), had a good year with the launch of 5 payloads on two balloons in May 2006. The two May 2007 launches had seven student payloads fly. And, the follow-on High Altitude Student Platform (HASP), had its maiden flight in September 2006. The second flight, in September 2007, had payloads from schools all across the country.

Internships: In another LaSPACE program that supports NASA Education Outcome 1.3, we had ten students in summer placement in 2007 including one at a NASA Academy, 2 USRP, 2 LARSS, 1 SAWDRIP, and 4 LMMO/LaSPACE student interns at the Lockheed-Martin Michoud Operations (LMMO) facility in New Orleans.

Student Conference: Our first student meeting occurred in 2007. Students presented posters, there was a program of speakers, a small display of space artifacts, and everyone enjoyed snacks. Graciously hosted by LaTech, at least a dozen students and their professors came from around the state. One Graduate Fellow from Tulane brought his whole family! **The reception allowed student networking across the state and communication with faculty/staff.**

#### **ANECDOTE**

John S. (LURA and GSRA recipient at LaTech).

**John graduated from LaTech University in May 2006 with a BS in Electrical Engineering. He is continuing his studies in graduate school at LaTech, working toward a PhD in Micro/Nanosystems Engineering. John was awarded a National Science Foundation Graduate Research Fellowship. This award covers tuition, travel, and provides a \$30K stipend per year for three years. This highly competitive fellowship is awarded to only a few percent of applicants. He is developing a portable spectroscopic water impurity monitoring system that has implications for Homeland Security, renewable sources of energy, and, possibly, planetary exploration. “My experience with the LURA program has been overwhelmingly positive. The program funded, in part, the development of a water chemistry device for my senior design project. My results for this project were published at the 2005 Louisiana Emerging Technologies Conference and have been submitted for publication in IEEE Sensors Letters. Overall, the research experiences during my senior year of undergraduate studies have persuaded me to pursue a Master’s Degree in Physics and a PhD in Engineering at Louisiana Tech.”** - LURA Student Evaluation Form (8/10/2006)