Louisiana Space Consortium
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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 $730,000. for fiscal year 2008.

PROGRAM GOALS

Our major Strategic Goals, 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. Included in all of the above is the objective to promote diversity. 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 Projects

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 3: Conduct Workforce Development Projects
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)

Implementation Goal 4: Engage in External Relations
Louisiana Objective 1: Interface With Statewide Interests to Promote Aerospace in Louisiana

PROGRAM BENEFIT TO OUTCOMES 1, 2 AND 3

Outcome 1 (Employ and Educate):

- Heath A. Berry, a graduate student at LaTech, completed a GSRA project and is scheduled to graduate this spring. He has already been hired (part-time) by Radiance Technologies who perform R&D in aerospace, space structures, intelligence etc. for civilian and military organizations. He will be heading up/supervising technical development for three separate SBIR contracts.

- Prof. Emad Habib, ULL, with student Boone Larson completed a project on rainfall measurement and drop size distributions comparing remotely sensed data and field measurements. A joint paper with NASA researchers was published by the American Meteorological Society in Monthly Weather Review.

Outcome 2 (Educate and Engage):

- The High Altitude Student Platform (HASP) completed its third successful flight carrying student built payloads from twelve SG institutions in ten states. Analysis reports from the flight have been received and show some excellent scientific results. The University of North Dakota/University of North Florida collaboration, for example, measured the atmospheric ozone profile using a new sensor technique. This resulted in a Master's thesis for the student and a presentation at an international conference.

- Undergraduate student Rebecca Currier completed a LURA project on using concentric ring electrodes to control seizures. She presented results at the annual meeting of the American Epilepsy Society and to the Houston Society for Engineering in Medicine and Biology. She graduated summa cum laude and is now pursuing a MD/Ph.D. degree at the University of Cincinnati. She writes: "Thanks largely to my (LaSPACE) LURA research experience, I was offered full tuition, health insurance and stipend support for all 7-9 years of the MD/Ph.D. program. Thank you."

- The NASA/LaSPACE Michoud Education Fellows Program completed its research experiences for teachers at the NASA Michoud Assembly Facility in New Orleans. The teachers were exposed to many facets of the Engineering and R&D at Michoud and are using this back in their classrooms. Academic year follow-up for the five science teachers from St. Tammany Parish is on-going. The Iberville Parish School System has asked to join the program next year.

Outcome 3 (Engage and Inspire):

- Modifications to the Mobile Astronomy Resource System (MARS) traveling van exhibit were completed to install a generator, projection system and screens, a display module and de-humidifiers. Not withstanding, MARS maintained a schedule of school and public visits, reaching over 2,000 people.

- LaSPACE and MARS participated in the Sally Ride Science Festival for middle-school girls. The highlight was a presentation by Astronaut Wendy Lawrence followed by workshops on STEM opportunities for both the students and the parents. Over 500 people participated.

PROGRAM ACCOMPLISHMENTS

Outcome 1: We have continued our Research Development, Fellowship, and Workforce development effort during FY08, bringing some projects to fruition and starting a number of new projects. During FY08 we had 11 research projects in various stages under the REA or URP programs, including five projects that were initiated that year. All projects involved students, either graduate or undergraduate or both. From our research bibliography, we show 6 papers in journals or in press, 9 conference presentations, 4 posters presented, one Master's thesis completed, and one seminar presented. One researcher received funding from the National Weather Service.

We supported six full-time fellowship students during the year and helped 15 additional students through the GSRA sub-program. A new competition was held and 4 – 5 new full-time fellows will be added in the coming academic year. No fellow graduated during FY08, but we expect several completions during FY09.

Our undergraduate student internship (LURA) program for mentored faculty/student research had 21 students involved during the year working on a large variety of projects. In addition, we had one student participating in the Minority Research Scholars project. Of the students who graduated, essentially all are planning to go on to graduate school or professional education. There were 9 presentations from LURA student research at national or international meetings, plus one poster entered in an undergraduate student poster competition.

We performed another LaACES student ballooning campaign, flying student built payloads from LSU, McNeese, UNO and GSU. Unfortunately, things do not always work as intended. We launched two sounding balloons, both of which flew successfully and terminated normally. However, on descent one of the payload strings went silent (both primary and back-up beacons) at ~20,000 feet. The potential impact area was heavily forested and, search as we could (including an aircraft over-flight), the payload was never found. The second payload landed normally and was recovered. The experiments on this balloon provided excellent data for the students. Loss of a full payload was a hard lesson, but things do not always go as planned in
R&D. On a positive note, a student team built a neutron detector and obtained good data up to

100,000 ft. while a second group recorded 'sound' during the flight. The student presentations to the technical staff at CSBF were terrific, and were received with enthusiasm.

Outcome 2: The HASP program had another successful flight. However, the big accomplishment was negotiating an agreement with the NASA Balloon Program Office at the Wallops Flight Facility to continue the HASP program for three additional years. We will have HASP opportunities available for 2009, 2010 and 2011. Already the payload seats for HASP-09 are almost fully committed. This attests to the value attached to the HASP program by both NASA and the SG user community.

LaSPACE 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. Together with our newest affiliate, SciPort in Shreveport, we are planning a new teacher education effort in northern Louisiana that will involve the Barksdale AFB. The project implementation is scheduled for next year.

Moreover, our new NASA/LaSPACE Michoud Education Fellows program had an excellent 'pilot' year (see above) and will be continued, and possibly expanded, next year. The teachers involved have brought their experience, and NASA materials, into the classroom.

For the summer 2008, LaSPACE sent nine interns to five separate programs. Not including ESMD, we had two students attend SIP at GSFC and 4 LMMO/LaSPACE student interns at the Lockheed-Martin Michoud Operations (LMMO) facility in New Orleans.

Outcome 3: The MARS van continues to expand its offerings – a new, portable planetarium will become operational in the near future. This collaborative venture between the Cain Center and Department of Physics and Astronomy, both at LSU, the BREC Highland Road Park Observatory and LaSPACE brings the excitement of Astronomy and Space Science to a variety of audiences. This past year the Society of Physics Students (SPS) prepared a number of basic physics demonstrations, traveled with the van and presented the demonstrations to students and the general public. Involving SPS students both motivates them as well as increasing the breadth of the science presentations possible with MARS.

PROGRAM CONTRIBUTIONS TO PART MEASURES

Student Data and Longitudinal Tracking: LaSPACE has worked to maintain a high degree of completeness in collecting longitudinal data, starting in the application process in which a student describes her/his eventual career goal and is followed, after the project, from student reports and evaluation forms by ascertaining the student's next position, e.g. job, or graduate school, and obtaining information on employment or school applications. Faculty sponsors/mentors help to gather and provide the tracking information. While we have >95% complete data on Graduate Fellowship awardees, tracking undergraduate participants has been more challenging since, upon graduation, some just seem to 'vanish.' We have employed letters to their home addresses as well as sources at their university to collect the data. We have good results for FY08 and continue to try to fill-in some of the gaps.

For FY08 we had 40 student awards among which 32.5% went to females and 15% were to under-represented minority students. For the students that we have been tracking for the past several years, nine students have moved into advanced STEM degree programs, one is employed in Aerospace related STEM while eight are employed in non-aerospace STEM. None have become NASA employees and three are employed in a STEM academic field. We have two students who have left STEM related fields entirely.

Matching Funds: LaSPACE achieved its matching fund commitment for FY08. Final financial reports, when completed, will show a slightly larger than required match.

Minority Serving Institutions: LaSPACE includes the majority of the MSI = HBCU institutions in the state. (The exception is the community college system.) At the moment, several of these institutions are inactive during their campus re-building activity. We continue to work to include these institutions in LaSPACE activities. We initiate two new programs focused specifically in this area: MRS and RIG-MF (Research Initiation Grant – Minority Focus). We currently have one MRS student and are working to establish a RIG project at one of the schools.

We have also embarked on the PACER project designed to introduce student ballooning to MSIs. The pilot program involved one HBCU – Grambling – who has now moved into establishing their own program. For FY08, we hosted two

MSIs, Norfolk State University and the Inter-American University of Puerto Rico – Bayamon. PACER is funded by NSF and looks beyond Louisiana to try to involve MSIs from around the country.

Southern University in Baton Rouge (SUBR) has been our primary ally. We have established a link to the Engineering program through support for students to participate in the MoonBuggy competition. Begun as an ESMD initiative, the response was so positive that this is now a LaSPACE project for FY08 and FY09. Moreover, the SUBR team has reached down to the local high school to inspire some of those students to become involved.

We combined research capabilities at SUBR and LSU to win NASA EPSCoR Research Team awards, which are on-going and involve significant student participation. We worked with SUBR and others to establish a new partnership project. Meanwhile, we continued mentoring Grambling and expanded PACER.

IMPROVEMENTS MADE IN THE PAST YEAR

Following hurricanes Katrina and Rita, we initiated a "Research Renewal Grant" subprogram to help with re-building the research base. This is no longer applicable, and this subprogram was eliminated during FY08. Its function can be easily absorbed into other subprograms such as REA or RIG.

While not an "improvement" per se, LaSPACE underwent a major management change at the end of FY08 when our long-time Program Manager left for a new job at JSC in Houston, TX. She continues to pass 'opportunities' back to Louisiana. Unfortunately, due to a 'hiring freeze' we were not able to replace her, and had to re-allocate management functions. Management changes will be on-going into FY09.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT

Consortium members include colleges/universities [Research Intensive (RIU); Research Active (RAU); Four year institutions (4YI)], HBCU's, business/industry partners (B/I), state education boards (Ed), and non profit organizations (NPO), structured as Sustaining Members (SM), Regular Members (RM), and Affiliate Members (AM).

•	Louisiana State University (SM)	--	RIU (Lead Institution)
•	Southern University and A & M College (SM)	--	HBCU – RAU (Co-founding Institution)
•	University of New Orleans (SM)	--	RAU
•	Louisiana Tech University (SM)	--	RAU
•	University of Louisiana at Lafayette (SM)	--	RAU
•	Louisiana Board of Regents (SM)	--	Ed (Co-founding Institution)
•	Lockheed Martin Michoud Operations (SM)	--	(inactive) – B/I
•	Northwestern State University of Louisiana (RM)	--	4YI
•	University of Louisiana at Monroe (RM)	--	4YI
•	Southeastern Louisiana University (RM)	--	4YI
•	Southern University of New Orleans (RM)	--	HBCU – 4YI
•	McNeese State University (RM)	--	4YI
•	Loyola University (RM)	--	(inactive) – 4YI
•	Xavier University of Louisiana (RM)	--	HBCU – RAU
•	Tulane University (RM)	--	RIU
•	Nicholls State University (RM)	--	RAU
•	Louisiana Business and Technology Center (RM)	--	B/I
•	Louisiana Board of Elementary & Secondary Education (RM)	--	Ed
•	East Baton Rouge Parish Recreation & Park Commission Highland Road Park Observatory (RM)	--	NPO
•	Dillard University (AM)	--	(inactive) HBCU – 4YI
•	Grambling State University (AM)	--	HBCU – 4YI
•	Sci-Port Discovery Center (AM)	--	NPO
•	LSU Agricultural Center (AM)	--	RIU (Research and Extension)