Welcome back to the Space Porter. It has been a busy, perhaps I should say hectic, year, but LaSPACE continues to make progress. We had a terrific group of Fellows, many of whom graduated in 2011, and we had a great set of interns go to NASA centers. Our LURA, MRS, GSRA and CSG students performed exceptional research. An evaluation of the 'pilot' CSG program was completed with a recommendation to continue this offering as resources permit.

The biggest news for LaSPACE was the addition of new personnel. We welcomed Ernecia Guidry as our Program Coordinator; Jenny Hay, a graduate student, will be working with the LaACES and PACER teams on document and presentation writing/preparation. Please send any newsworthy items to the LaSPACE office (eads@phys.lsu.edu) at any time.

LaSPACE enjoyed working with the Zachary Community School District to help them complete a Student Space Experiments Program (SSEP) payload for STS-134 (see pg 3). Moreover, the LaSPACE/NASA Michoud Education Fellows (MEF) project graduated its third cadre of educators who each utilized, in unique ways, the NASA materials in their classroom (see pg 4). Scotlandville Magnet High School received full certification from Project Lead the Way for their Academy of Engineering program. Finally, the LaSPACE Scholars program continued its training of good STEM students and educators.

John P. Wefel
Professor and Director
Louisiana Space Consortium
Louisiana NASA EPSCoR
Three student ballooning teams traveled to the Columbia Scientific Ballooning facility in Palestine, Texas in late May to launch their payloads into near-space! Teams from Grambling State University, Louisiana State University, and Southern University participated in the Aerospace Catalyst Experiences for Students (ACES) program during the 2010-2011 school year, which is a realistic simulation of the design, construction, and launch of an aerospace project. Students spent two semesters learning skills and gaining experience in project management, experiment construction, data collection, and analysis in an applied environment. Not only did the teams design and build their own experiments, but they also composed review documents and presented their experiment results, honing their technical writing and professional speaking skills in the process. The ACES program works to attract students to aerospace related STEM careers.

ACES-23, 24, and 25 Launch

ACES-23 students and LaACES staff presented papers at the 2nd Annual Academic High Altitude Conference in Ames, Iowa, 22-24 June 2011!

Action Shots!

Top: Aces teams from LSU, Grambling State University, and Southern University

Middle: Grambling State team prepares for launch

Bottom: ACES-23 and 25 Launch!
An experiment developed by a student team from Copper Mill Elementary School in the Zachary Community School District in Louisiana was selected by the “Student Spaceflight Experiment Program (SSEP)” for flight on STS-134 during April, 2011. The experiment developed by grade 5 students, Alexis Albert, Grace Dry, Madison Russel and Leanne Sorrel, with assistance from Tyler Jackson and Jake O’Brien and support from LaSPACE, studied the effects of microgravity on the growth rate of murine myoblasts. The results of their research contribute to the body of knowledge about cell growth. The students’ experiment was reviewed by NASA for science content and correct application of the scientific method. Competition was nationwide and the Copper Mill Elementary team was one of only 16 selected for flight! In addition, Zachary Community School District used the SSEP competition to augment teaching about the nature of science and the scientific method throughout their elementary, middle and high schools.

Image below: Alexis Albert, Grace Dry, Tyler Jackson, Jake O’Brien, Madison Russell, and Leanne Sorrel, with teacher Circe Bridges from Copper Mill Elementary, LaSPACE staff, and LSU and SU scientists recognized at a Zachary Community School Board meeting for their achievements through the Student Spaceflight Experiment Program.
During the 2010-2011 academic year, LaSPACE has helped the Maine Space Consortium improve their institutional capacity for student-based aerospace experiments as part of the Maine Student High Altitude Platform (MeSHAP) consortium development project. The LaSPACE assistance involved a detailed transfer of knowledge and technology about how to conduct a university level student sounding balloon research program. This included a five day technical workshop in January 2011 for nine Maine Space Consortium instructor leaders. The workshop included the construction of balloon payloads to measure temperature, pressure, and humidity as a function of altitude, training in how to assemble and fly a balloon vehicle, licensing for amateur radio technicians, and balloon flight of the team payloads. LaSPACE continues to give assistance through the provision of technical advice during the bi-weekly MeSHAP teleconferences, as well as the construction of radio tracking beacons and GPS controlled cut-down devices for the Maine balloon flights.

THE “MAINE” EVENT

The MEF-3 Cohort gathered in May to celebrate the completion of the year-long program at the Michoud Assembly Facility in New Orleans. Through the MEF program, educators explore the way science content and inquiry skills, mathematics, and communication skills are used by scientists, engineers, and skilled workers in facilities such as Michoud and the Stennis Space Center. The experience encourages educators to incorporate new elements of STEM-related inquiry into their classrooms while reinforcing the importance of their influence on students. As part of the program, fellows interviewed professionals from the Michoud Assembly Facility to highlight the importance of science, mathematics, and communication in their careers. The interviews from MEF-3 as well as the first two cohorts can be viewed online at http://www.stpsb.org/NASA/nasavideolinks.htm.

The “MAINE” EVENT

During the 2010-2011 academic year, LaSPACE has helped the Maine Space Consortium improve their institutional capacity for student-based aerospace experiments as part of the Maine Student High Altitude Platform (MeSHAP) consortium development project.
**PI:** Dr. Md Abdus Salam, Department of Computer Science, Southern University  
**Title:** Protocol Enhancement for Wireless Sensor Networks in Space Environments  
**Summary of Achievements:** Under LaSPACE Consortium Sustaining Grant (CSG) support, the PI along with two graduate students conducted research to enhance the energy-efficient routing protocol for wireless sensor networks in space environments, published two research papers and submitted three proposals, two to NSF.

**PI:** Dr. Lu Peng, Department of Electrical and Computer Engineering, LSU  
**Summary of Achievements:** Through this Research Enhancement Award, Dr. Peng conducted collaborated with Dr. Greg Bronevetsky and submitted proposals to the DOE, NASA, and NSF. A presentation of the research took place at the IEEE International Symposium on Performance Analysis of Systems and Software in Austin in April. Additionally, Lide Duan, a PhD student supported by this project, will graduate in 2011.

**PI:** Dr. Shizhong Yang, Department of Computer Science, Southern University  
**Summary of Achievements:** Under CSG support, the PI performed first principles molecular dynamics simulations on Ta and  
& (1:1) co-doped c-ZrO$_2$ and optical properties at LONI supercomputers. The CSG also supported undergraduate student Corey Baham, who earned the LONI fellowship due to his hard work and good performance. Four papers and presentations resulted from this research, along with two DOE proposals.

**PI:** Dr. Manu John, Department of Mechanical Engineering, Southern University  
**Title:** A Novel 3D Composite Laminate with SMA Z-pins for Impact Mitigation and Self-Sealing in Aerospace Applications  
**Summary:** This project aimed at developing a composite laminate for impact mitigation and self-sealing in aerospace applications. The novel approach described employing Shape Memory Allow (SMA) pins in carbon fiber laminate to achieve through thickness strength enhancements and improved resistance/tolerance to delamination effects during a low-velocity impact.
In February of 2011, the University of Louisiana at Lafayette Cajun Advanced Picosatellite Experiment (CAPE) team successfully launched Crawsat III, a High Altitude Weather Balloon experiment. The payload contained an Arduino sensor board prepared by Northside High School students, as well as a string of “PearlSats,” prepared by NP Moss Elementary School students. A PearlSat is a string of ping pong balls cut in half to receive a miniature payload, such as a seed, to be exposed to the near-space environment of the high altitude weather balloon. Read more about CAPE at [http://ulcape.org](http://ulcape.org).

Lorenzo Evans, a Junior in Electrical and Computer Engineering at the University of Louisiana at Lafayette, who was supported partially by the LaSpace Minority Research Scholars (MRS) program, was instrumental in designing and helping to get a student-built communications satellite, called the Cajun Advanced Picosatellite Experiment (CAPE), downlisted for a NASA launch early in 2012. This second satellite built and launched by UL Lafayette students “is going to be more advanced. We’re testing experimental technologies, such as a software defined radio and peak power tracking,” said Chase Savoy, a Junior in the same department who was partially supported by the LaSpace CSG program. The 2nd generation CAPE satellite will also test the use of deployable solar panels.

Students Jacoby Hudson and Rodney Aguirre with mentor Dr. Hua Mei of Xavier University of Louisiana synthesized a new perfluoroalky(aryl) sulfonimide diazonium monomer. This monomer can be polymerized and directly attached to a carbon electrode in order to achieve high conductivity and stability of the Proton Exchange Membrane Fuel Cell (PEMFC). The students presented their scientific findings at Carnegie Mellon University, the American Chemical Society Southwest Meeting and the LaSPACE annual meeting. Both students graduated in Spring 2011 and are currently applying to graduate programs.
In December 2010, undergraduate chemistry major Leah Garber and Dr. Chadwick Young at Nicholls State University completed a NASA LaSPACE project to determine the distances to low-mass star-forming cores using archival data from the Naval Observatory, the 2 Micron All-Sky Survey, and the Spitzer Space Telescope. Dr. Young and Dr. Tyler Bourke (Harvard's Center for Astrophysics) have recently observed a star-forming core at the Multiple Mirror Telescope with a multi-fiber spectrograph; they are using this data to supplement and verify the work of Ms. Garber and Dr. Young. Drs. Bourke and Young have recently submitted a 3-year plan to the NSF for furtherance of this work. In addition, Dr. Young will soon begin to visit high school science classes in the Bayou region to share this work and what it means to be an astronomer in Louisiana.

Student Glenn Braud completed a research project with mentor Dr. Anderson Sunda-Meya of Xavier University of Louisiana to grow thin films and characterize them with Atomic Force Microscopy and Pizoresponse Force Microscopy. Glenn was trained on the PLD system to grow the samples and the Atomic Force Microscopy for characterization. The student has successfully grown several BiFeO$_3$ films on SrTiO$_3$ substrates with SrRuO$_3$ buffer layer. They are now ready to be analyzed with Xavier's pizeoresponse force microscope and Raman spectrometer to understand the relation between structural distortion and ferroelectricity. Glenn prepared a poster presentation on this research for the Xavier University Festival of Scholars. He graduated from Xavier in Spring 2011 with a Physics degree.

Student Allison Vides completed a research project with mentor Dr. Kelly Johanson of Xavier University of Louisiana to use the transcription factor Pax3 to develop a model system necessary to test a new, high-throughput technique for evaluating transcription factor interactions with DNA. Allison worked closely with Dr. Johanson to learn techniques of protein expression and purification resulting in the successful purification of GST-Pax3. She also used computer-based resources to design DNA sequences to test for the model system and evaluated potential binding sites for the related transcription factor, Pax3-FOXO1. Allison presented her results from the sequence analysis at the Xavier University Festival of Scholars and the Louisiana Cancer Research Consortium Annual Retreat. Allison is a pre-pharmacy major, but is now considering applying to graduate school when she graduates in May 2012.
CONGRATULATIONS TO RECENT GRADUATES!

LSU Dept. of Physics and Astronomy—PhD: Jennifer Andrews, Brent Budden, Shannon Fritz, Bobby Beaird; MS: Bobby Matthews, Gordon Mancuso; BS: Sean Baldridge, Nicholas Cannaday, Zachary Cummings, William Freeman, Nicholas Khan, Daniel Lum, Eric O’Quinn, John Reid, Brian Simpson

Dillard University—BS in Physics: Keanna Holmes, Wayman Woods; BS in Physics and BS in Engineering: Lanika Webb

Grambling State University—BS in Physics: Gabriel Burks

Louisiana State University in Shreveport—BS in Physics: David Mallon, Matthew Gongre, David Horn, David Lindsay, Chris Palyok, David Poe

McNeese State University: BS in Physics: James Sampson; BS in Physics, BS in Mathematics, and BS in Computer Science: Megan Miller

Southern University in New Orleans—BS in Biology: Kandace Shenell Atkins (Cum Laude), Katherine M. Boykin, Frances L. Cenance, Wendi Cooper, Theophilus Irivbo Edovia, Alicia Encalade, Dorcas Falodun (Cum Laude), Paris Farran Favoirte, Esther Francois, Norman Gallo, Jr., April Renada Green, Don J. Harris (Magna Cum Laude), Evony Harris, Marquetta Mare Harris (In Absentia), Courtney Janai Hebert, Valesha Hill, Raquel Shantel Hunger-Johnson, Dakeia Shamone Johnson, Nadia Tionne Jones, Courtney Danielle LeBlanc (Cum Laude), Herman R. Mackey, Jr. (Magna Cum Laude), Jennifer Ann Parker, Preshus Robertson (Cum Laude), Candace D. Smith, Jerilynn Lisa St. Cyr, Erika Alicia Suazo, Dominique Townsend (Cum Laude), Nam Trong Tran; BS in Chemistry: Andrika Cooper; BS in Mathematics: Cuana J. Holmes

University of Louisiana at Lafayette—MS: Jack Elliot Manuel, Joshua Lawrence Riner, Mark H. Roberts; BS: Peter Youssef Achi, Paul Michael Giovinazzo, Christopher Seth Hill, Brandon Tyler Touchet

Xavier University of Louisiana—BS in Chemistry: Jocoby Hudson, Rodney Aguirre; BS in Chemistry/Pre-Med: Carita Winn

“I have received a GSRA. That helped when I had my second child to cover some expenses. I was able to get my PhD. I then continued on as a Post-Doc funded by the CIA. I now am working for National Security Technologies. I will soon be deployed overseas for testing.” Scott Pellegrin, Louisiana Tech University Alumnus

“I was the first LaSPACE Fellow in Dr. Wilson’s group. That funding was essential for my continuation in the program where I eventually completed my PhD in the field of radiological monitoring. I am now working for a small SBIR-focused company in Boston, developing cutting-edge radiological monitoring systems for Homeland Security and also for space flight.” Chad Whitney, Louisiana Tech University Alumnus
Inaugural Ballooning Program for Teachers

The first Wallops Balloon Experience for Educators (WBEE), building upon the partnership with LaSPACE took place July 12-15 at the Columbia Scientific Balloon Facility in Palestine, TX. Stemming from the continued cooperation of LaSPACE and NASA, WBEE expands the HASP (High Altitude Student Project) and LaACES (Aerospace Catalyst Experiences for Students) platforms into secondary education with a focus on core principles and future partnership with educators and their institutions. Participants were involved in classroom and hands-on balloon science activities, and built, tested, and launched their own science payload under the direction of NASA and Louisiana Space Consortium personnel. Educators will be able to implement these flight week experiences and the related educational materials with their students.

Sci-Port Educator Programs

To The Stars: Moon, Mars & Beyond: During the latter part of the 2010 school year, Sci-Port hosted an educator workshop designed to give teachers confidence in using NASA resources in their classrooms. Fourth through eighth grade teachers were brought to the Center to explore such questions as: Are we going to live on Mars someday? How about the Moon? What things can we learn from other planets in our solar system? The workshop provided answers to these questions as well as multiple classroom activities, materials and resources. Keynote educational speaker Elaine Scott, author of When is a Planet not a Planet? and Mars and the Search for Life, kicked off a day of learning that included activities regarding the NASA Educator Resource Center and Digital Learning Networks, Mercury and the MESSENGER Program and integrating science and language arts.

Sci-Botics: The Sci-Port Barksdale Sci-Botics Teacher Education Program, first held in 2009, will begin its third summer this year. Last year’s program served 20 educators and reached an additional 500 students. These educators connected to STEM in multiple ways, including a visit to the Barksdale Air Force Base robotic bombs division and the construction and programming of their own LEGO NXT robots. Then the educators used these robots to teach STEM in their weekly curriculums. The program culminates in a robotic competition at Sci-Port to enable students to demonstrate the concepts and skills gained during the last school year. Teachers described the workshop as “excellent and very informative.”

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LaSPACE Mission:
To Enhance Space and Aerospace related research, education, and public awareness throughout the State of Louisiana and thereby promote STEM education, training of professionals, and economic development.