



SPACE GAZETTE

Northrop Grumman (NG) Academy

At the end of September last year the NASA Florida Space Grant Consortium (FSGC) was reminded of the key role that individual companies and corporations play in the educational realm when they choose to fulfill their altruistic aspirations. The Northrop Grumman Corporation donated a check of \$25,000 to FSGC ; the funds were given so that FSGC could use its existing network of education entities, resources, and educators to provide hands-on STEM projects and experiences for collegiate students from across the Space Coast. The search for students turned up some of the most interesting and motivated individuals from Central Florida who came together from Embry Riddle Aeronautical University, the University of Central Florida, Brevard Community College, and the Florida Institute of Technology to create a dynamic team whose collaborative efforts made sure that they would become much more than just a sum of their parts. (cont. on page 2)



Engineering—Teacher (ET) Connection

The ET Connection is a recent initiative to help connect STEM teachers with engineers (subject matter experts). This project is managed by the University of Central Florida’s College of Engineering Outreach Office (UCF-CECS) and sponsored by FSGC and the GE Foundation. The intent is to help teachers find (engineering) speakers, mentors and subject matter experts who are available on-line to respond to teacher content questions, provide technical support to student projects and make classroom visits. The ET Connection will enable engineers to find teachers in geographic areas and content areas related to their interests. Both teachers and engineers will set up on-line accounts that will profile their interests using a modified version of our CompAS software that matched over 700 faculty with funding opportunities and provided targeted announcements relative to each individual. The same software has been used for the past six years to match Volusia Governments departments with grant opportunities. The system will also enable NASA KSC Education to disburse STEM information, training announcements and surveys to teachers based on their specific (STEM) content interests. UCF-CECS is working with the Florida Engineering Society to use their engineering database for the start-up phase. They have 100+ engineers profiled from across Florida so we plan on incorporating the data and using their physical locations to help determine which school districts are the first we target for teacher involvement.

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Special points of interest

- Fellowships
- Research
- Workforce Development
- Informal Education



Academy students with Gen. Roy Bridges

NG Academy (cont from pg. 1)

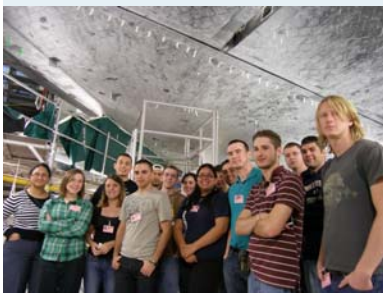
With the support of Space Florida, the Northrop Grumman Academy was held on every Friday between October 16th and November 13th. The students worked together to make a payload for a scientific weather balloon and were given both tours and advice from space industry professionals. The program ended on the last Friday with a rather climactic event when NASA Astronaut Roy Bridges, a former Space Shuttle Challenger pilot, came to enlighten the students with tales of his adventures and advice on how they could follow their own dreams wherever they may lead. The Florida Space Grant Consortium is ultimately grateful to the Northrop Grumman Corporation for making this special Academy possible.

“Former NASA Astronaut and ex-KSC Director Gen. Roy Bridges, came to enlighten the students with tales of his adventures and advice on how they could follow their own dreams wherever they may lead”.

South Florida Academy



Balloon Launch



Academy students under the Space Shuttle Orbiter

South Florida Academy

An integral aspect of the FSGC’s mission is the expansion of our programs throughout the state so that their impact is felt across all geographic, social, and economic lines. In our continuous quest to remain true to this philosophy, last year FSGC established the first collaborative engineering workshop specifically for undergraduate students from South Florida. A total of sixteen students from Florida International University and the University of Miami spent the week of December 14th-18th, 2009 at the Kennedy Space Center working together as a team to build and test payloads for scientific weather balloons. The payloads were a video camera and GPS.

The group was also treated to tours of KSC on which they visited the Cape’s most famous assembly buildings, launching sites, and scientific laboratories to observe the work and life of the people who make the space program tick. The tours are planned and designed not only for their educational value but also for their ability to showcase to these students the potential career options that they will have if they choose to continue to pursue an education in Science, Technology, Engineering, and Math.

This Academy was sponsored by FSGC and supported by Space Florida.

Florida Space Research Program

The NASA Florida Space Grant Consortium (FSGC), and Space Florida awarded 22 space research and education grants for 2009. The Florida Space Research Program (FSRP) provided a total of \$453,191 in funding to selected recipients.

The FSRP combines both Federal and State funds for projects that diversify Florida's space industry and research efforts, while also supporting aerospace workforce development statewide. The program is comprised of three categories – The Space Education & Training Program, Space Exploration & Spaceport Technical Development, and Space-Based Research and Payload Development. .

Grants are awarded to faculty researchers from Florida's public and private universities and community colleges. Non-academic organizations are also eligible to receive grant awards if their proposed projects significantly involve Florida's academic institutions.

"I believe this is the year in which our two organizations have shown an outstanding commitment to research", said Dr. Jaydeep Mukherjee, Director of FSGC, and administrator of the program. "Continuing to fuel the fire of research, despite economic conditions, affirms just how important we believe space research is to our universities, our space industry, and the future of our state."

"Space Florida is proud to be a partner in the Florida Space Research Program," noted Frank DiBello, Space Florida President. "These special grants will stimulate research activities throughout the state and strengthen long-term cooperation between universities and industry."

The State of Florida and Space Florida have been significant contributors to the Florida Space Research Program for five years. Space Florida contributed \$62,500 to the 2009 program.

The FSRP 2009 awardees include eight Florida universities: the University of North Florida, Florida State University, University of Florida, University of Central Florida, Florida Institute of Technology, Embry Riddle Aeronautical University, Florida Gulf Coast University, Florida International University, and two additional Florida educational entities – The Astronaut Memorial Foundation's Teacher Connect program and the Jacksonville based 'Tekna-Theos' group.

Research projects selected include:

- Development of a Propellant-less Propulsion System for LEO (Low Earth Orbit) satellites (UCF)
- Development, design and distribution of innovative CRATERSCAPE Curriculum (FSU)
- Expansion of Internet Embedded Systems Lab to Enhance Space-Related Courses (FGCU)

Cont. page 6

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2009-10 FSGC Fellows

Every year the Florida Space Grant Consortium is able to reward the state's best and brightest STEM graduates by providing them with the funding they need to realize their entire academic vision. Accepted applicants are given a fellowship stipend of \$20,000 for full-time doctoral study or \$12,000 for full time master's study. This year saw a particularly impressive list of candidates and therefore choosing who to fund was no mean feat for the experienced FSGC review team. After much careful deliberation, the selected students come to the fore with a set of credentials, research projects, and goals that are second to none. Our 2009/2010 Fellows are as follows:



Ernesto Abruno—Univ. of Central Florida (Doctoral)

Ernesto is conducting research that “is centered on finding new ways to circumvent or harness free carrier and two photon absorption in order to design devices with more net energy efficiency. One method previously demonstrated is the two photon photovoltaic effect, which harvests energy that otherwise would have been lost to TPA. This ultimately results in solar cells that can tap into a greater portion of the sun’s energy, which can aide in the success of long term space, lunar and martial endeavors.”

This technology is important for making satellites more energy efficient and is invaluable for meeting the energy needs for long term space missions and settlements. Ernesto is conducting this research as part of the *Energy harvesting in silicon photonic devices* project.

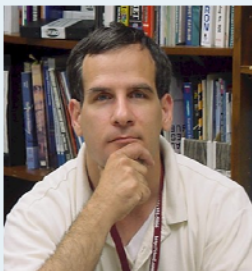
Benjamin Burnett—Fl. Institute of Technology (Masters)

Benjamin is working on a project called *Self Assembly Phenomena in Biology*. The members of the group, including Benjamin of course, are focusing their efforts on “studying the self-assembly of large protein structures. Specifically, we are studying the formation of amyloid fibers. We believe that these types of processes might be similar to the self-assembly mechanisms that began life here on Earth and might also give us insight as to what sorts of simple biological mechanisms might be found on other planets. In addition to astrobiological motivations, we are also concerned with amyloidosis diseases. Our lab consists of a diverse background of scientists and students, ranging from physics to biochemistry to chemical engineering, providing a unique atmosphere of collaboration.”



Angelo Karvalos—Florida State Univ. (Doctoral)

Angelo has been supported for his project entitled; *Development of High Performance Undergarment Material for Lunar/Mars Missions-Extreme Environment Protection*. His research focuses on developing new materials for identifying and neutralizing agents which are detrimental to crew safety and health in space environments. This is the type of research that is critical in determining how to plan and develop environments and practices that will be able to provide human beings with safe and comfortable habitats in space.



Michael Lucas—Univ. of South Florida (Masters)

Michael was provided a fellowship for his research on the project entitled: *Dunites in the Sky: Where Are All of the Olivine ASTEROIDS?* Michael will be testing why there appears to be discrepancies in population of olivine-dominated asteroids. In Michaels own words, “results suggest several scenarios for their scarcity, including three hypotheses to be tested in my research; these asteroids either: (1) have been shattered to small sizes (<5 km) over the collisional lifetime of the asteroid belt, (2) are abundant but their spectra have been altered in some way masking their presence, or (3) differentiated asteroids did not form thick olivine-rich, metal-poor mantles (Burbine, 2000), and differentiation on these bodies is not understood.”



Jason Ybarra—Univ. of Florida (Doctoral)

Jason has been supported for his project entitled; *How environment influences global star forming properties within the Rosette Molecular Cloud.* Jason has, in his own words, improved his method of “discovering and analyzing the thermal structure of shocked gas in outflows produced by young stars which are still in the process of forming using data from Spitzer Space Telescope Infrared Camera (IRAC).” He has also “applied this method to a region in the Rosette Molecular Cloud and discovered a new parsec scale outflow and driving source. The IRAC color analysis combined with near-infrared narrowband molecular hydrogen imaging data allowed for the analysis of the interaction of the outflow with its surrounding environment and the production of thermal and column density maps of the outflow.”



Starry Nights

Sponsored by the Florida Museum, University of Florida Astronomy Department, Santa Fe College Astronomy, the Florida Space Grant Consortium, GE Foundation and Alachua Astronomy Club, *Starry Nights* is a free event full of activities for the entire family. This night of inter-planetary adventure gives visitors a chance to speak with expert astronomers, learn about the tools they use, and see rocks from space. Last year's Starry Night took place on September 25th at the Florida Museum of Natural History as part of the International Year of Astronomy, a yearlong celebration of astronomy and its impact on society and culture. Starry Nights visitors had the opportunity to build their own "Galileoscope," a working telescope and the cornerstone project of the International Year of Astronomy.

The event was also graced by the presence of former Space Shuttle Astronaut Capt. Winston Scott who came to share stories of his life as an astronaut and his adventures in space. Attendance was up this year and the signs are clear that informal education events such as this can have an impact on the scientific interest and awareness of the general population of our state.



Captain Winston Scott



Galileoscope workshop

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Research Program (cont. from pg 3)

- Aerodynamic Stability Research for Satellites in Elliptic Low Earth Orbits (ERAU)
- Learning Chemistry through Mars-Themed Experiments in a Virtual Lab (FIT)

A total of 50 proposals were received. Each submission was independently evaluated by a team of experienced professionals from Kennedy Space Center, other NASA centers and Grant Consortia located throughout the U.S.

The FSRP provides an opportunity for FSGC and Space Florida to cooperatively achieve the goal of promoting and developing Florida's aerospace industry while simultaneously supporting space research and education projects.

FSGC Vision

To lead the National Space Grant Consortia with exceptionally effective, innovative programs and activities supporting STEM education and aerospace/space academic-NASA-industry partnerships throughout Florida.

FSGC Mission

To strengthen Florida's economy and augment NASA Educational Outcomes by:

- providing space-related fellowships, scholarships, and internships;
- supporting research opportunities, and academic-NASA-industry partnerships; and
- enhancing STEM awareness, literacy, education and excellence in Florida's citizens, public and private educational systems, and workforce.

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