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Media Relations

July 17, 2013

High Schoolers Will Launch Scientific Balloons to Near Outer Space



Caption: The 2013 Project SMART balloon team from left to right, back row: teachers Lou Broad, Charles Smith, Rich Levergood, Scott Goelzer. Front row: students Nicholas Lajoie, Anthony Jones, Arianna Zrzavy, Erich Trickel, Eloy Torres, Brandon Ng, Sara Pesavento, Sita Mishra. Photo by David Sims, UNH-EOS.

DURHAM, N.H. — On Thursday, July 18, 2013, high school students and their University of New Hampshire Project SMART mentors will launch twin weather balloons that carry miniaturized scientific payloads designed to measure cosmic rays and environmental parameters such as air pressure and temperature. The flight will also serve as a test platform for a NASA-funded instrument built at the UNH Space Science Center to measure gamma rays.

The weather-dependent launch is slated for noon, give or take an hour, from the grounds of the Saint-Gaudens National Historic Site in Cornish. Given favorable winds at high altitude, the instrument payloads will ride up to 100,000 feet—the edge of outer space—in unique, three-foot, dish-shaped, Styrofoam and cardboard re-entry vehicles built by the students and designed to float safely down to Earth without aid of a parachute.

At 100,000 feet, the helium-filled balloons will be the size of a house and will burst under pressure. The tandem balloon flight should allow the researchers to video each balloon's ascent in an effort to characterize flight behavior and improve future design and performance. The gamma-ray experiment being flown will allow UNH research assistant professor Peter Bloser to determine

if smaller, lighter detector technology will function properly in the near vacuum of the upper atmosphere — a development that would allow satellite missions to save on critical mass and weight limitations.

The experiment is part of the four-week Project SMART (Science and Mathematics Achievement through Research Training) summer residential program at UNH, which concludes next week. The program, now in its 22nd year, is designed to help spur high school juniors and seniors into careers in science and mathematics. Students work with faculty in three disciplinary modules: space science, marine and environmental science, and bio- and nanotechnology.

For the space science module, each summer physics teachers Lou Broad of Timberlane Regional High School in Plaistow, Scott Goelzer of Coe-Brown Northwood Academy, Rich Levergood of Londonderry High School, and UNH research professor Charles Smith guide the students through four weeks of lectures and research in conjunction with UNH Space Science Center/Department of Physics faculty and staff. The balloon project and launch is the culmination of the summer's activities.

Broad notes that the balloon experiment is a "simulated satellite launch" in that it mocks the building and launching of a satellite, only on a very different scale; the whole experiment costs less than \$1,000 and the process takes just a few weeks from start to finish as opposed to the years required to design, build, and launch a satellite.

Students are directly involved in the design and building of both the reentry vehicle and electronic components like the miniaturized microcontroller that gathers all the onboard data, does some calculations and analysis, and stores it all for after-flight analysis.

“They build the components, launch what they created to collect real environmental and performance data and get it back for analysis,” says Levergood. “They’re doing real science that is not coming out of a textbook; it’s a rich experience for them.”

Taking part in testing new gamma-ray detector technology for future NASA space missions is rich indeed and, says Bloser, “The students will get to analyze the flight data recorded and see what the atmospheric gamma-ray spectrum looks like.”

Adds Broad, “They walk away from these four weeks with a good understanding that science and engineering is a collaborative process. Fifteen of us are working on this project and these students know they’re not the first to do it – they know they’re working from a legacy of the past 12 years of these balloon launches, and each year brings new challenges and improvements.”

Says SMART student Arianna Zrzavy, a senior from ConVal High School in Peterborough, “I’ve never had a hands-on research experience and have actually never taken physics — I’m more interested in history. But because of Project SMART I now plan on taking physics next year and am more interested in pursuing science in college.”

Other students participating in this year’s SMART space science module include Nicholas Lajoie from Concord (NH) High School, Sara Pesavento from Davis Senior High School in Davis, CA; Brandon Ng from Colonie Central High School in Albany, NY; Anthony Jones from Coe-Brown Northwood Academy; Erich Trickel from Hellgate High School in Missoula, MT; Eloy Torres from Leadership Public Schools in Hayward, CA; and Sita Mishra from the Law and Government Academy in Hartford, CT.

The flights can be followed using the Internet by entering the amateur (ham) radio call signs N1RCA-11 and N1RCA-12 into a search engine and following the prompts.

The University of New Hampshire, founded in 1866, is a world-class public research university with the feel of a New England liberal arts college. A land, sea, and space-grant university, UNH is the state's flagship public institution, enrolling 12,200 undergraduate and 2,300 graduate students.

Photographs to download:

<http://www.unh.edu/news/releases/2013/jul/Smartgrp.jpg>

Caption: The 2013 Project SMART balloon team from left to right, back row: teachers Lou Broad, Charles Smith, Rich Levergood, Scott Goelzer. Front row: students Nicholas Lajoie, Anthony Jones, Arianna Zrzavy, Erich Trickel, Eloy Torres, Brandon Ng, Sara Pesavento, Sita Mishra. Photo by David Sims, UNH-EOS.

http://www.eos.unh.edu/newsimage/smartsat5_lg.jpg

Caption: Earth from an altitude of 20 miles (105,600 feet) as photographed by cameras onboard last year’s Project SMART balloon.

http://www.eos.unh.edu/newsimage/smartsat3_lg.jpg

Caption: Balloon burst at 105,900 feet at the end of last year’s successful ascent.

Media are welcome to attend the launch. For details and potential post-launch photos/video, contact David Sims at (603) 862-5369 or david.sims@unh.edu.

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