National Aeronautics and Space Administration

Rocket Report

2011

Sounding Rockets Program Office

What's Inside...

In Brief...

The NASA Sounding Rockets Program launched 13 science and technology missions in FY 2011. 33 missions are currently scheduled for FY 2012.

41.093 & 41.094 Robertson missions are being prepared for flight in Norway. The first day of the launch window is October 10, 2011.

Preparations are underway for a second Terrier–Improved Malemute demonstration launch. The launch is currently on schedule for October 21 from Wallops Island, VA.

A tour of the sounding rocket facilities was arranged for the NASA Chief Technologist during a visit to Wallops.

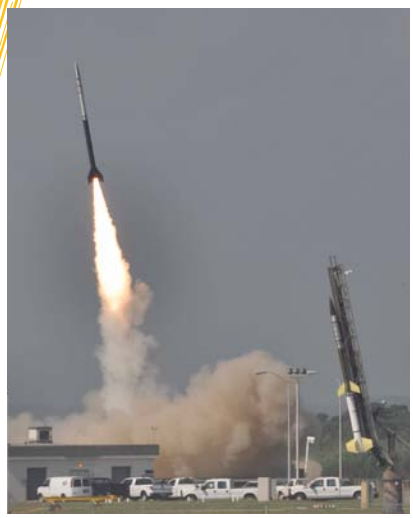


Photo by Libby West\SRPO

21.141 lift–off and 41.091 on the rail.

21.141 & 41.091 Pfaff – Daytime Dynamo launched July 10, 2011

The purpose of this mission is to explore, for the first time, the ion–neutral coupling, wind shears, and electrodynamics of the mid–latitude lower ionosphere during the daytime. In particular, the missions attempt to determine the cause of intense daytime irregularities that are consistently observed in the mid–latitude, ionosphere during the summer. The first two, of four, rockets were launched in 2011. The science team will evaluate the results from these flights and make adjustments to enhance the science data from the two remaining flights, scheduled for 2012.

41.092 Rosanova – RockSat–X launched July 21, 2011

The next step in the student space flight program – RockSat–X!

After the students have completed the RockOn! workshop and designed an experiment for RockSat–C, it's time to approach the next challenge – build an experiment for RockSat–X.

Continued on page 2.

Photo by Wallops Imaging Lab

RockSat–X team on Wallops Island.

RockSat-X continued.

The NASA Sounding Rockets Program Office, together with the Colorado Space Grant Consortium, offered an advanced level, dedicated student sounding rocket mission in 2011. Three university teams participated in this mission.

University of Northern Colorado

The Reentry Experiment Sat–X mission (REX SAT–X) was designed to

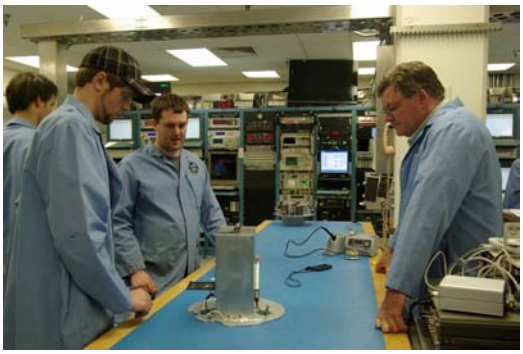
Phil Eberspeaker/Chief Sounding Rockets Program Office (right) reviewing REX SAT–X with student from University of Northern Colorarado.

gather detailed inertial and thermal loading data for a small ejectable rocket capsule. The capsule's reentry flight will be used to characterize its environment as it reenters the atmo–sphere, allowing the team to create a generalized understanding of how the Earth's atmosphere affects descend–ing bodies. The data will be used to refine the capsule's design which will later be offered as a standardized experi–ment deck for future ejectable RockSat–X projects.

Image of REX SAT–X deploying captured by onboard HD video camera.

University of Wyoming

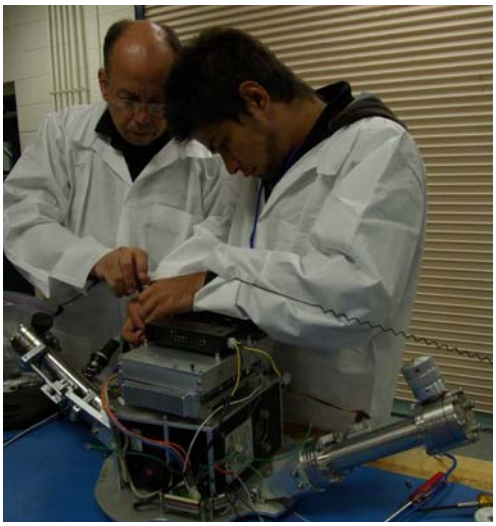
University of Wyoming created a platform for capturing high–altitude, atmospheric "space dust," optical photos, and record real–time sensor data. The success of this mission will provide in–situ data of the upper atmo–sphere. Additionallly the experiment provides a foundation for future RockSat–X missions in the form of thermal, pressure, and vibrational load data, from launch until splashdown.



Phil Eberspeaker with the University of Wyoming team and their experiment.

University of Puerto Rico

This experiment included mass spectros–copy to analyze molecular species and their respective partial pressures in near space. The experiment will contribute valuable information for interstellar travel and advances benefiting space bound crews who may want to collect and replenish essential resources such as water and fuel.



University of Puerto Rico during integration and testing of the RockSat–X experiments.

RockSat–X differs from the RockOn!/RockSat–C mission in that the experiments get full exposure to the space environment. Additional payload services include telemetry, de–spin module, and power which allow a greater range of experiments.

RockSat–X was launched on a Terrier–Improved Orion, two–stage sounding rocket from Wallops Island, VA on July 21, 2011. The payload reached an apogee of 121.32 km and was recovered off the coast of Virginia. The onboard experi–ments were returned to the students for data analysis.

For more information about the RockSat–X flight opportunity, see:

http://spacegrant.colorado.edu/index.php/national–programs/rsxlink

12.076 Brodell - Terrier Mk12 testround launched September 8

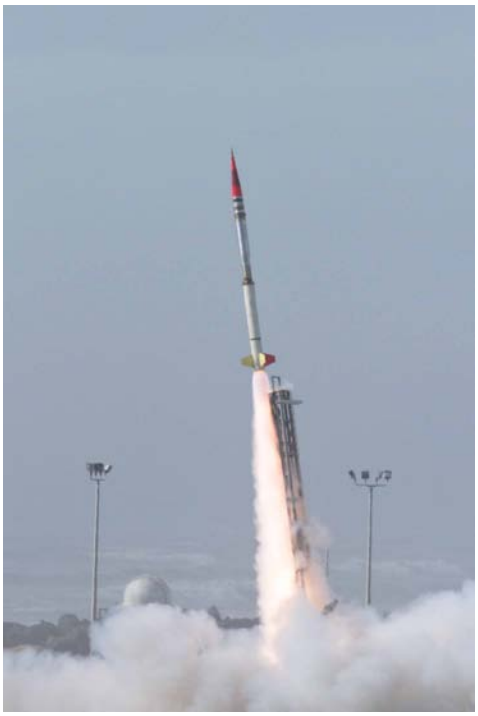


Photo by Wallops Imaging Lab

The purpose of this mission was to verify the design modifications made to the MK12 Terrier motor to compensate for grain shrinkage issues that occur due to aging.

Integration and Testing

41.093 & 41.094 Robertson – Charge and mass of meteoritic smoke particles (CHAMPS)

The scientific objectives of the two rockets are to detect and measure the meteoritic smoke particles (MPS) in the mesosphere that have long been thought to be the condensation nuclei for noctilucent clouds. The rockets are designed to gather data on the number density and mass distribution of MSPs as a function of altitude and their sign of charge, with and without solar illumination.The launches are from the Andoya Rocket Range in Norway in order to benefit from simultaneous meteor radar and lidar observations that will give a more comprehensive view of the state of the mesosphere.

Project Engineer Shannon Dickson/University of Colorado working on the experiment.

Mark Frese, Nate Wroblewski and Mark Hylbert prepar–ing for deployments on one of the Robertson payloads.

12.074 Hall – Terrier– Improved Malemute test flight

12.074 Hall is the second test flight of the Terrier–Improved Malemute launch vehicle and is scheduled for flight from Wallops Island, VA in late October 2011. A diagnostics payload will be flown to provide characterization of the performance of the vehicle configuration. The payload will also include the Aft Looking Video System (ALVIS). The Terrier–Improved Malemute was first flown on March 27, 2010 from Wallops Island.

Gary Snead, Andrew Muesler and Eduardo Lagman working on 12.074 Hall.

Education

Eastern Shore Rocketry Challenge

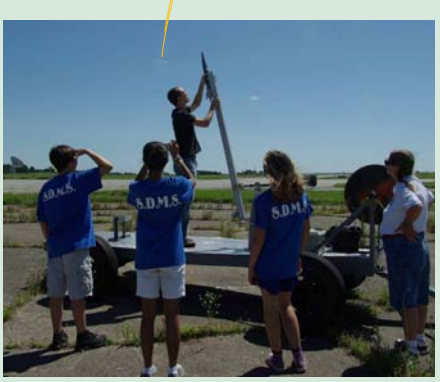
The first Eastern Shore Rocketry Challenge, sponsored by the NASA Sounding Rockets Program Office, took place this summer in coop–eration with Worcester County Middle Schools Summer STEM program.

A teacher workshop was held at Wallops in May to familiarize the teachers with model rocketry, sounding rockets and the science and enginering of rocketry. With the exception of the parachute drop testing, the majority of the activities took place in the new WRATS workshop area in F–7. A full day of activities included lectures on sound–ing rockets, performance analysis, recovery systems and rocket motor performance. Additionally, teachers constructed model rockets and parachutes and participated in a model rocket motor static firing demonstration. NASA educator guides, model rocket flight performance software and other educational documents were provided to each school. Each participating school was also provided with a complete materials kit that included various body tubes, fins, nose cones and motor mounts.

The focus of the challenge was to have students design and build a model rocket and participate in a competition event at Wallops. Included in the competition elements were flight performance analysis, testing of flight vehicle stability, logo design and participation in a design review. On launch day the students were asked to present their design, analysis and testing procedures to a panel of NASA rocket experts.

In addition to launching the “competition rockets”, students participating in the Summer STEM program also launched ESTES Alpha III rockets while at Wallops. During two days of launches, July 14 and 15, an estimated 160 rockets were launched and recovered on the Wallops airfield. Total participation in the Summer STEM program School was approxmately 220 students.

Tours of Wallops were arranged for the participating students and on July 6 & 7 all 220 students visited the Range Control Center, Balloon lab and the Sounding Rocket fabrication and testing areas. The students also spent time at the Wallops Visitor Center.



Rocket Report

Picture Place...

① Bonnie Maxfield and Mark Bartels conducting electrical checks.

② Wayne Taylor posing with a Robertson payload.

③ 12.074 Hall team.

④ Puerto Rico RockSat–X team.

⑤ Shannon Dickson and Dr. Robertson reviewing data.

⑥ Glenn Maxfield and Mick Sharp at the Eastern Shore Rocketry Challenge.

⑦ Model Rocket Recovery Team.

Want to contribute?

Working on something interesting, or have an idea for a story? Please let us know, we'd love to put it in print!

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From the Archives...

The Ugly Hooker, a Shorts Skyvan, recovering a payload in 1987.

Launches FY 2011