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Rocket Report

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Sounding Rockets Program Office

In Brief...

The RockOn III workshop, managed by Colorado and Virginia Space Grant Consortia, is in the works. Target launch date is June 25, 2010.

Concept development activities for a third IRVE mission are underway.

NSROC interns presented results of their work to an audience of NASA and NSROC staff. For information about the intern program, contact Jan Jackson and jpdjack@msn.com.

WSMR upgrades are progressing according to plan. The HVAC installation in the VAB low bay is nearly complete.

FY 2010 is shaping up to be a busy year. The launch manifest includes 26 missions.

Two successful launches, 36.221 and 39.009, ended FY 2009.



36.254 NR Lift-off from Wallops Island

Photo by NASA/Sean Smith

36.254 NR Cheatwood – Inflatable Re-entry Vehicle Experiment (IRVE)

IRVE II, designed by NASA Langley and built by ILC Dover, was successfully launched with a NASA Black Brant IX sounding rocket on August 17, 2009.

IRVE demonstrated with a subscale model that a vehicle entering a planet's atmosphere – in this case, Earth's – can inflate a heat shield and withstand the temperatures and pressures characteristic to hypersonic velocities. Computer models, wind tunnel tests and engineering assessments have provided every indication IRVE will work. But the concept was not proven until the experiment flew, taking advantage of what NASA researchers describe as "a wind tunnel in the sky."

More on page 2.

12.067 GT Hall – Terrier-Improved Malemute

In preparation for the first launch of the Terrier-Improved Malemute sounding rocket, a test firing was conducted on Wallops Island. Results from the test firing indicate that motor performance is within the expected range. The motor was initiated using the flight igniter housing that incorporates an in flight arming system. The first flight is currently scheduled for FY 2010.

Cubesats from Kentucky University and Cal Poly are flying as secondary payloads on the first flight of the Terrier-Improved Malemute. The Kentucky team visited Wallops in July to test fit their Cubesat.

Improved Malemute test firing.



Photo by Wallops Imaging Lab

36.254 Cheatwood continued...

NASA's Inflatable Re-entry Vehicle Experiment, or IRVE, is a mission designed to demonstrate that an inflatable structure can be used as a heat shield to safely slow a spacecraft moving at hyper-sonic speed (greater than Mach 5, or five times the speed of sound) through a planet's atmosphere. This technology could be used on a future mission to land a spacecraft on Mars.

The purpose of a heat shield is to prevent a spacecraft from being damaged by high temperatures as it decelerates through a planet's atmosphere. The larger the total surface area of the heat shield, greater the drag force generated. This increased drag can be used to deliver more mass to a given altitude or surface elevation, or a given mass to a higher altitude or surface elevation. The larger heat shield produces more friction at higher altitudes, slowing the spacecraft down faster in thinner atmospheres. The ability to land a

probe at a higher surface elevation will open up more of a planet's surface to exploration.

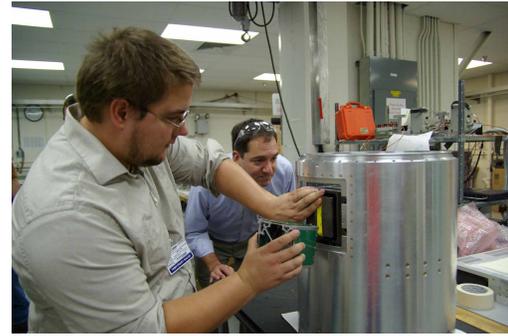
Currently, the size of the rigid heat shield available for any given mission is limited by the diameter of the launch vehicle's payload fairing, which in turn limits the payload size and weight, the number of science instruments that can be carried, and the resulting productivity of the mission. An inflatable heat shield would not be constrained by the fairing diameter and would allow a larger, more capable payload to be flown.



IRVE II payload team preparing to balance the payload at Wallops.

Information obtained from: NASA Langley Fact Sheet 378699main_NASAFacts-IRVE.pdf

12.067 Hall Cubesat



Kentucky University students spent time at Wallops test fitting their Cubesat in the Poly Picosatellite Orbital Deployer (P-POD) installed in the 12.067 Hall payload. California Polytechnic State University (Cal Poly) will also have a Cubesat on this mission.

For more information about Cubesat program, visit:
<http://cubesat.atl.calpoly.edu>

36.221 DS Moses launch is a success

The Helium Resonance Scatter in the Corona and HELiosphere (HERSCHEL) mission was successfully launched from White Sands Missile Range, NM on September 14, 2009. The purpose of this mission is to combine, extend and refine the capabilities of the SOHO EIT, LASCO and UVCS instruments.

This mission is named after John Herschel, whose observation of Halley's Comet's tail led him to hypothesize the presence of a "repulsive force" known today as the solar wind.

Solidworks model of the HERSCHEL payload by Thomas Widmyer.



Photo by Berit Bland

Touring the shop with Tom.



Recent upgrades and new equipment in the machine shop include a HAAS 40–SL lathe with a max cutting length of 44” and 25.5” diameter. The lathe is equipped with live tooling, has a 7” bore and cuts at a max speed of 1,400 rpms. The tool probing feature allows quicker setup of jobs. Photo above left shows Jeff Paige operating the HAAS 40–SL.



A 4th axis radial cutting feature has been added to the Leadwell V–40 vertical machine and is particularly useful for small parts. Pictures (top right) show Tom Shockley (left) Chris Edwards (right) demonstrating the machine.

The new OMAX Waterjet machine provides enhanced cutting capability and speed. Any material, except magnesium, up to 8’ x 4’ and 6” thick can be cut. All payloads have some parts made with the waterjet. Additionally, the system cleans and recycles the water leaving no waste. Picture (middle, right) students getting a tour of the waterjet machine.



The Mr Debur vibratory finishing machine automates the deburring process. Parts are inserted into the bin where they mix with abrasive media, soap and water. The machine vibrates and rubs the media against the parts deburring them. Picture of Tom Shockley with the deburring machine. Insert shows ceramic media.

Picture Place...

Postcards from San Nicholas Island courtesy of Herbie Haugh and Ken DiGiulian. Herbie and Ken, with the rest of the MARTI mission team, participated in launch operations on San Nic earlier this year.

Photo by Herbie Haugh – Rocks

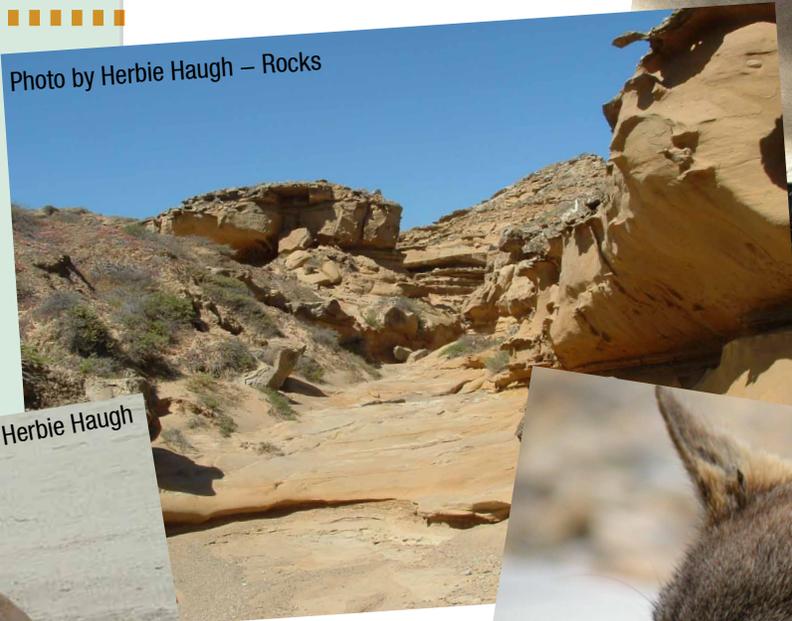


Photo by Herbie Haugh
Seal



Photo by Herbie Haugh
Sea lion

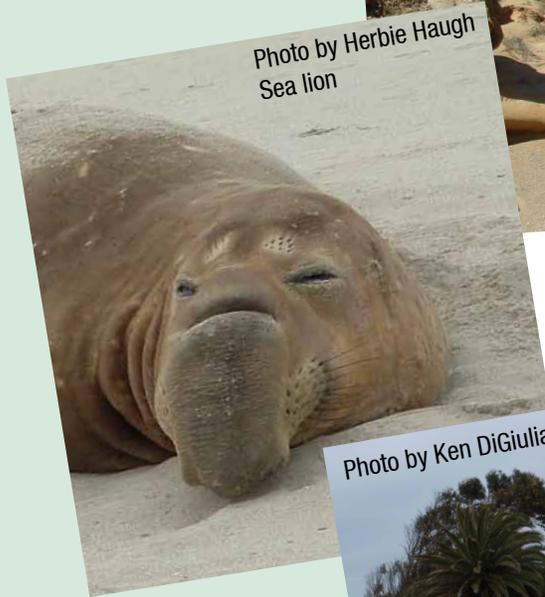


Photo by Herbie Haugh
The San Nic Fox



Photo by Ken DiGiulian – Nic Town



Photo by Ken DiGiulian – Terrier-Lynx



Photo by Ken DiGiulian – Launch area



Rocket Report

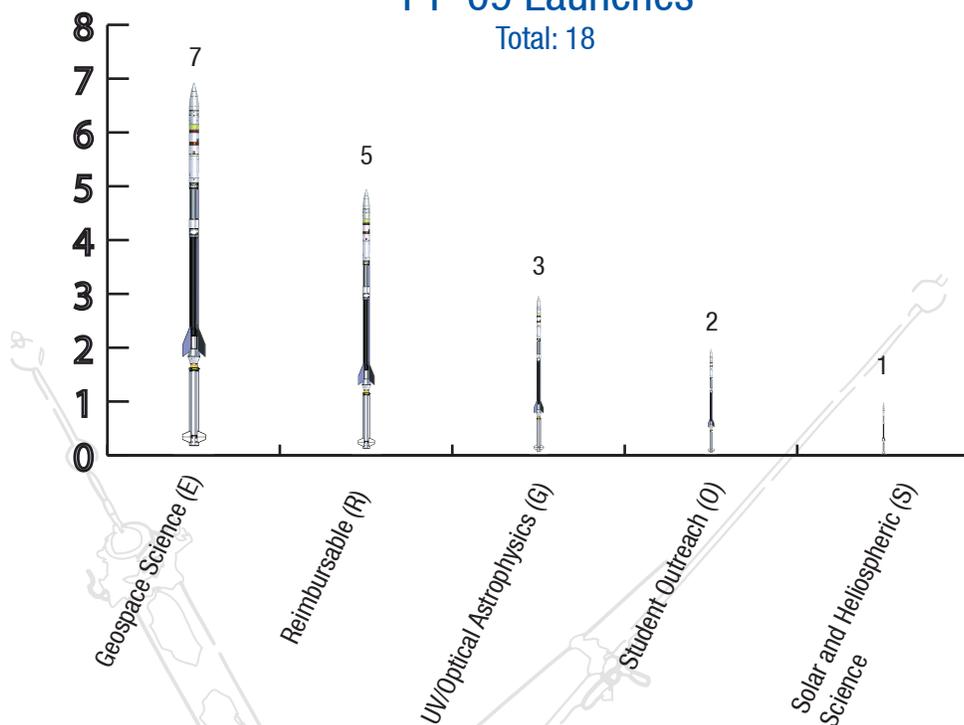
Want to contribute?

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

Contact:
Chuck Brodell
Phone: #1827
Email: Charles.L.Brodell@nasa.gov
or
Berit Bland
Phone: #2246
Email: Berit.H.Bland@nasa.gov

FY '09 Launches

Total: 18



From the Archives...

Launch guests at Woomera, Australia in 1987.

From November 1987 to March 1988 six Terrier-Brants were launched from Woomera to study the Supernova 1987A. These missions, launched only months after the discovery of the supernova, exemplify the fast response of the sounding rockets program.