National Aeronautics and Space Administration

Rocket Report

2010

Sounding Rockets Program Office

What's Inside...

In Brief...

The National Research Council (NRC) report **Revitalizing NASA's Suborbital Program** is available for download at: http://www.nap.edu/catalog/12862.html

Mark your calendars for Wallops Flight Facility Open House, June 5, 2010, 10 a.m. – 4 p.m.

Registrations are being accepted for the RockOn! 2010 workshop. The workshop will be held at Wallops June 19 – 24, 2010. Register online by April 19th: http://spacegrant.colorado.edu/rockon/

Inspire the Next Generation is happening at Wallops on April 22, 2010. Employees are invited to bring their children, grades 4 – 12, to work on this day.

The Sounding Rocket Working Group (SWRG) meeting was held at Wallops on February 4, 2010. For more information on the SWRG see: http://rscience.gsfc.nasa.gov/index.html

Photos by Lee Wingfield \ Wallops Imaging Lab

Waiting for launch, 40.025 Labelle (top) and 41.084 Conde (bottom).

2010 starts successfully with two launches from Poker Flat, AK

A four stage Black Brant XII and a two stage Terrier–Orion were successfully launched in February 2010 from Poker Flat, Alaska. Both missions gathered data on the Aurora Borealis.

First off the pad was Dr. Mark Conde's testflight of a new TMA deployment technique. The payload included a constellation of 16 TMA ampules designed to be deployed during flight. TMA releases are used to study wind gradients at altitude. This new technique, when perfected, allows the use of one payload and one vehicle to eject upto 48 TMA ampules throughout a three–dimensional volume along a vehicles flight path.

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12.067 Hall – Terrier–Improved Malemute testflight

The first testflight of the Terrier–Improved Malemute occured on March 27th, 2010, when 12.067 GT Hall launched from Wallops Island.

In addition to vehicle diagnostics the payload included CubeSats from Kentucky University and California Polytechnic Institute.

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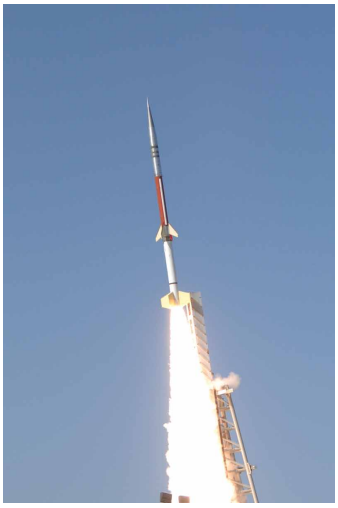

Photo by Lee Wingfield \ Wallops Imaging Lab

12.067 lift–off

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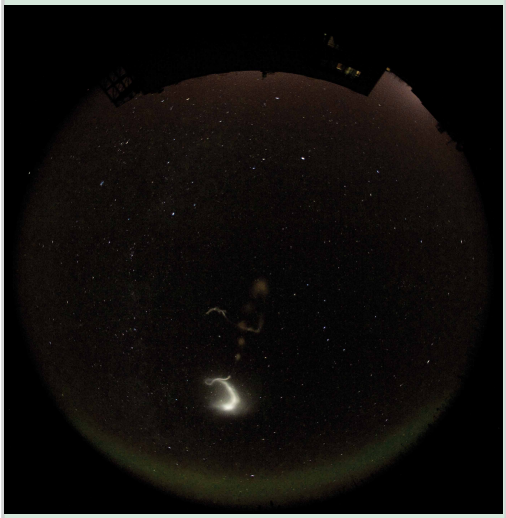
2010 starts... cont.

Previous missions have required several launches in close sequence leading to complex operations sce–narios to accomplish similar objectives. A second test flight is in planning to build on the excellent results obtained.



All–sky camera image of Conde TMA releases. Image courtesy of Poker Flat Research Range.

Photo by Berit Bland

Dale Henderson working on ampules during integration at Wallops.

Photo by Berit Bland

Jeff Cain and Brian Rose with the Conde payload duing integration at Wallops.

The second mission to launch from Poker Flat, AK was 40.025 Labelle, Correlations of High Frequencies and Auroral Roar Mea–surements (CHARM) II.

Photo by Scott Hesh/NSROC

Aurora over Poker.

Understanding the dynamical role of Lang–muir and upper hybrid waves and the mechanisms and characteristics of resulting electromagnetic radiation is a high priority in space physics. This mission will answer several of the outstanding questions about the physics of these high–frequency waves in the Earth's aurora. Additionally, a new X–band telemetry system was tested on this flight.

Photo by Lee Wingfield/WFF Imaging Lab

John Hickman/SRPO (left) with Dr. Craig Kletzing, Co–I, Univ of Iowa, Dr. Jim Labelle, PI, Dartmouth College, and Ted Gass/NSROC Mission Manager.

Terrier-Improved Malemute cont.

Students from Kentucky Space and California Polytechnic University, San Luis Obispo, built CubeSats for this first of a kind sounding rocket mission.

The Kentucky CubeSat, called ADAMASat, was developed by students to allow testing of hardware and software they intend to fly in an orbital cubesat called KySat–1 to be launched with the NASA Glory mission no earlier than November 2010. The subsystems tested with the suborbital flight include an antenna deployment system and power condi–tioning circuitry.

The Cal Poly cubesat, a test bed for Poly–Sat bus technologies, tested an attitude determination system.

Students staffed several ground stations at Wallops, as well as stations at the University of Kentucky in Lexington, Morehead State University and at the U.S. Naval Academy in Annapolis, Md., to capture the telemetry during the flight. In addition, students distributed software packages for amateur radio enthusiasts to participate in the project.

Photos by Berit Bland

Above: Kentucky ground station on Wallops Island, ready to receive.

Left: Students from Kentucky Space monitor incoming data packets. All systems functioned as designed!

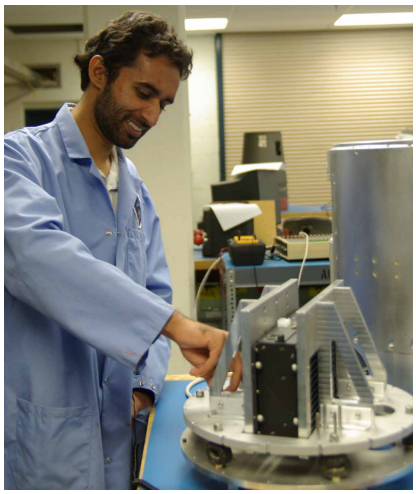
Article from NASA Wallops website: http://www.nasa.gov/wallops

Integration and Testing

Heyne 41.087 NT – Terrain Relative Navigation and Employee Development (TRaiNED)

TRaiNED was selected as the first Hands–On Project Experience (HOPE) Training Opportunity (TO) mission. The scientific objective of TRaiNED is to advance Terrain–Relative Navigation (TRN) technology by collecting a set of correlated ground imagery, Inertial Measurement Unit (IMU) and Global Positioning System (GPS) data during a sounding rocket flight and performing post–flight data analysis. In addition, TRaiNED will be developing and verifying a TRN filter for the post–flight data analysis.

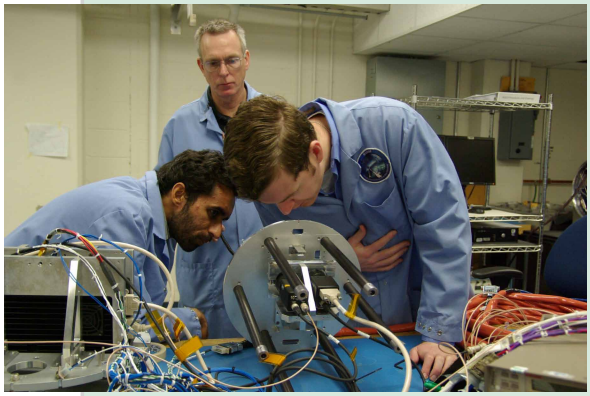
In addition to the scientific objectives, TRaiNED will provide hands–on flight project experience to enhance the technical, leadership and project skills for the selected NASA in–house project team. The project team is comprised of early career hires supported by mentors who were part of a previous sounding rocket mission, 41.086 NT Seybold.



Left: Shane Brennan/ JPL and Justin Babcock test fitting alignment prisms.

Right: Moham–mad Ahmad/JPL with experiment section.

Mentor Dr. Calina Seybold, right, with Than Tran, left, going through the instrument checklist.



Mohammad, Shane and Charlie Cathell (in the back) aligning cameras.

Clark 36.261 UG – VeSPr Mission to study the atmosphere of Venus

The twin goals of this flight are 1) to obtain a high resolution spectrum of the Hydrogen (H) and Deuterium (D) Ly alpha emissions from the Venus atmosphere, and thereby determine the D/H ratio at the top of Venus' atmosphere, and 2) to obtain an H Ly alpha image of the extended emissions from the Venus corona. Both the present D/H ratio and the extent of the emission from the coronal atmosphere are related to the present–day escape of water from the atmosphere of Venus into space. The end goal is to learn about the history of water on Venus.

Venus must be observed near elongation, when it appears farthest from the Sun on the sky. While it can be seen in the dark sky either after sunset or before sunrise at different points in its orbit, for the purposes of this experiment only the elonga–tions after sunset will meet the requirements of the spectral data. This relates to the line of sight Doppler shift of the Venus emission lines, Venus emissions must be blue–shifted with respect to the Earth geocoronal emission to observe the Venus D line clear of other backgrounds. The upcoming windows for these elongations are in July 2010 and in Feb/March 2012.

Dr. Clark with payload team members. Valerie Gsell, Justin Babcock and Ed White.

Venus in UV by Hubble Space Telescope. L. Esposito (U.CO), NASA

Justin Babcock with the 36.261 skins on the bend test fixture.

Picture Place...

Photos from Poker Flat, AK during winter ops. Thanks to Karl Haugh and Lee Wingfield.


Photo by Karl Haugh/NSROC


Photo by Karl Haugh/NSROC


Photo by Lee Wingfield/Wallops Imaging Lab


Photo by Lee Wingfield/Wallops Imaging Lab

Photo by Karl Haugh/NSROC

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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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Upcoming Launches

May
36.258 UE WOODS/UNIV. OF COLORADO WS
36.270 UG GREEN/UNIV. OF COLORADO WS

June
12.069 GT HICKMAN/NASA-WFF WI
12.070 GT HICKMAN/NASA-WFF WI
36.265 UG BOCK/CAL TECH UNIVERSITY WS
36.213 NS DAVIS/MSFC WS
41.087 NT HEYNE/JPL WS
41.088 UO KOEHLER/UNIV. OF COLORADO WI

July
36.261 UG CLARK/BOSTON UNIVERSITY WS

August
36.219 US HASSLER/SWRI WS
12.071 GT HICKMAN/NASA-WFF WI
12.072 GT HICKMAN/NASA-WFF WI
36.263 US JUDGE/USC WS

September
36.257 UG GREEN/UNIV. OF COLORADO WS
36.268 UG MCCANDLISS/JHU WS
36.269 GS RABIN/NASA-GSFC WS
36.264 UH MCCAMMON/UNIV. OF WISCONSIN WS
36.173 UG NORDSIECK/UNIV. OF WISCONSIN WS
36.225 UG CHAKRABARTI/BOSTON UNIVERSITY WS

Note! White Sands (WS) launch dates are subject to adjustment depending on hardware availability.

From the Archives...

Bill Payne, left, and Mike Smolinski, right, working on 36.004 Kellogg. This mission was launched from Poker Flat, Alaska on January 31, 1987. The photo was taken at Wallops in 1986.