National Aeronautics and Space Administration

Rocket Report

2013

Sounding Rockets Program Office

What's inside...

In Brief...

Nineteen (19) sounding rockets, covering 7 of 10 disciplines, were successfully launched during FY 2013. Launch statistics are on the last page.

The Sounding Rockets Team received an Agency Honors Group Achievement Award for exceptional execution of the 2012 flight program.

The upcoming Far–Ultraviolet Off–Rowland Telescope for Imaging and Spectroscopy (FORTIS) mission will observe comet C/2012S1 (ISON). The PI is Dr. Stephan McCandliss/Johns Hopkins University. This will be second flight of the FORTIS instrument.

Three missions close out Fiscal Year 2013.

Daytime Dynamo, 21.140 & 41.090 GE Pfaff, launched on July 4th.

The two Daytime Dynamo sounding rockets, 21.140 Black Brant V, and 41.090 Terrier-Improved Orion, were successfully launched 15 seconds apart on July 4th as part of a study of electrical currents in the ionosphere. The Daytime Dynamo mission is a joint project between NASA and the Japan Aerospace Exploration Agency, or JAXA.

The project was designed to study a global electrical current called the dynamo, which sweeps through the ionosphere. The first rocket carried a payload that collected data on the neutral and charged particles in the ionosphere. The second rocket released a long trail of lithium gas to track how the upper atmospheric wind varies with altitude. These winds are believed to be the drivers of the dynamo currents.

Photo by Patrick Black

The two Daytime Dynamo rockets airborne on July 4th.

For more information, see: http://www.nasa.gov/mission_pages/sounding-rockets/news/electrical-dynamo.html

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RockSat-X 46.005 successfully launched August 13, 2013

The third RockSat-X advanced student flight opportunity was launched from Wallops Island, VA on August 13, 2013.

Seven Universities participated in the 2013 RockSat-X mission and experiments included; the X-HED video camera system from Colorado University, electron density measurement from Johns Hopkins University, space environment measurement from West Virginia University, microgravity crystallline growth experiment from Colorado University, electrical component survivability experiment from University of Minnesota, durability of flexible electronics in a cryogenic environment from Northwest Nazarene University and particle impact detection and capture experiment from University of Puerto Rico.

For more information on the RockSat-X program, please visit: http://spacegrant.colorado.edu/national-programs/rs-x-2014-home

Photo by Berit Bland

RockSat–X teams with payload at Wallops.

36.239 US Korendyke - VEry high Resolution Imaging Spectrometer (VERIS)

The Naval Research Laboratory's (NRL) VEry high angular Resolution Imaging Spectrometer (VERIS), a fast, high resolution, imaging spectrometer for solar studies, was successfully launched from White Sands Missile Range, NM on August 8, 2013.

VERIS greatly improves the current instrument capabilities in a number of critical ways. It provided the first ever subarcsecond (0.15 arcsecond/pixel) spectra of transition region and coronal structures, with a spectral resolution of >5000 to allow Doppler velocity determinations to better than 3 km/s. VERIS used a novel two-element, normal incidence optical design with highly reflective EUV coatings to access a spectral range with broad temperature coverage (0.03-15 MK) and density-sensitive line ratios. Finally, in addition to the spectra, VERIS simultaneously obtained spectrally pure slot images (10x150 arcsec) in the +/-1 grating orders, which can be combined to make instantaneous line-of-sight velocity maps with ~8km/s accuracy over an unprecedented field of view.

VERIS continues NRL's strong tradition in solar UV spectroscopy, starting with the SO-82A and SO-82B instruments on Skylab, and continuing with the highly successful HRTS and VAULT rocket experiments and the EIS instrument that will fly on Solar-B.

For more information on VERIS see: http://www.nasa.gov/content/goddard/veris-sounding-rocket-to-study-active-regions-on-sun/

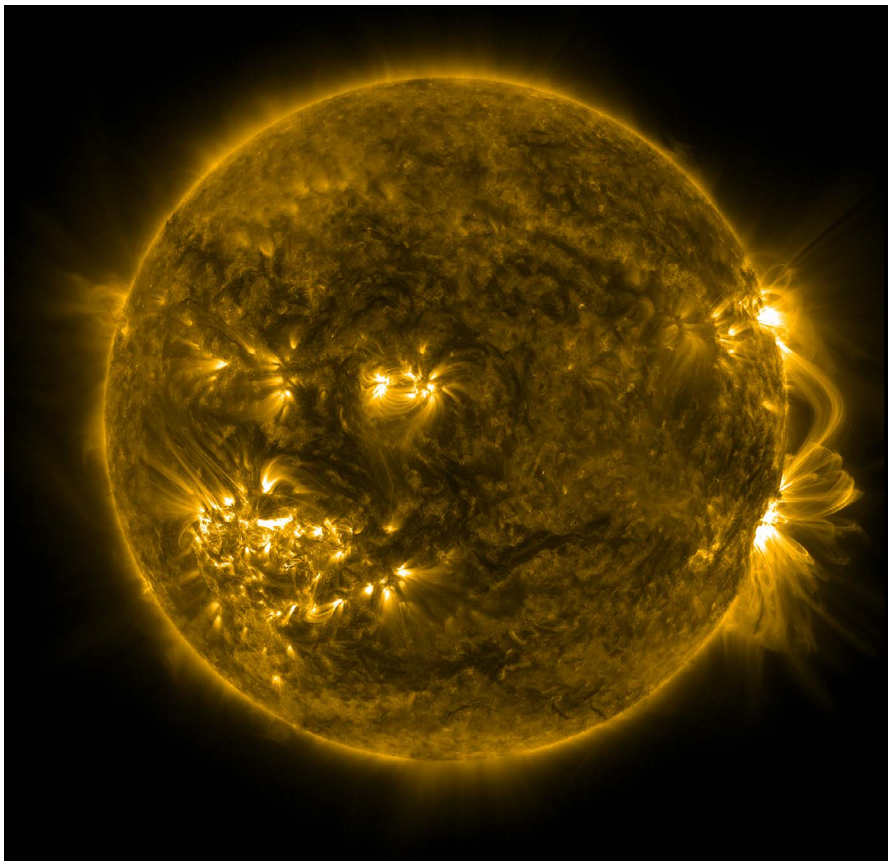

Image by NASA/SDO

The VERIS rocket gathered data on the physical properties of the Sun's active regions, imaged here by NASA's Solar Dynamics Observatory (SDO).

Integration and Testing

36.245 UH Figueroa - Micro-X

The Micro-X instrument combines a high-energy-resolution X-ray microcalorimeter with an imaging mirror to obtain the first imaging X-ray microcalorimeter spectra from an astronomical source.

High spectral resolution is obtained by using arrays of microcalorimeters operating close to the theoretical limit. As a photon is absorbed in a microcalorimeter and its energy converted to heat, the resulting temperature rise can be measured by the resistance change of a Transition Edge Sensor (TES). These microcalorimeters are cooled to temperatures of about a hundredth of a degree above absolute zero to function properly.

The first flight of Micro-X will investigate the plasma conditions (such as temperature, electron density and ionization) and the velocity structure of the Bright Eastern Knot of the Puppis A Supernova remnant (SNR). The obtained high-resolution X-ray spectra (90,000 counts collected in 300 seconds at 2 eV resolution across the 0.3 - 2.5 keV band) will help to ascertain the temperature and ionization state of the X-ray emitting gas in Puppis A. The mission will also search for the presence of supernova ejecta in the SNR remnant, measure or place upper limits on turbulent flows, and measure bulk motions of the plasma.

In addition to performing the first scientific observation with TES microcalorimeters in space, the Micro-X program will also aid in the understanding and development of future flight qualified microcalorimeter systems for larger orbiting missions. Finally, it will help to attract talented young scientists to X-ray astrophysics and thus serves as a direct pipeline for experimental expertise to future X-ray missions such as Constellation-X.

The Adiabatic Demagnetization Refrigerator (ADR) for the Micro–X mission at Wallops for vibration testing.

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Frank working on GREECE – 36.287 Samara.

Belinda, Max and Tom with the RockSat–X flotation aid section.

Nate and Max inspecting Daytime Dynamo booms after deployment.

Brian and Karl working on the Daytime Dynamo payload.

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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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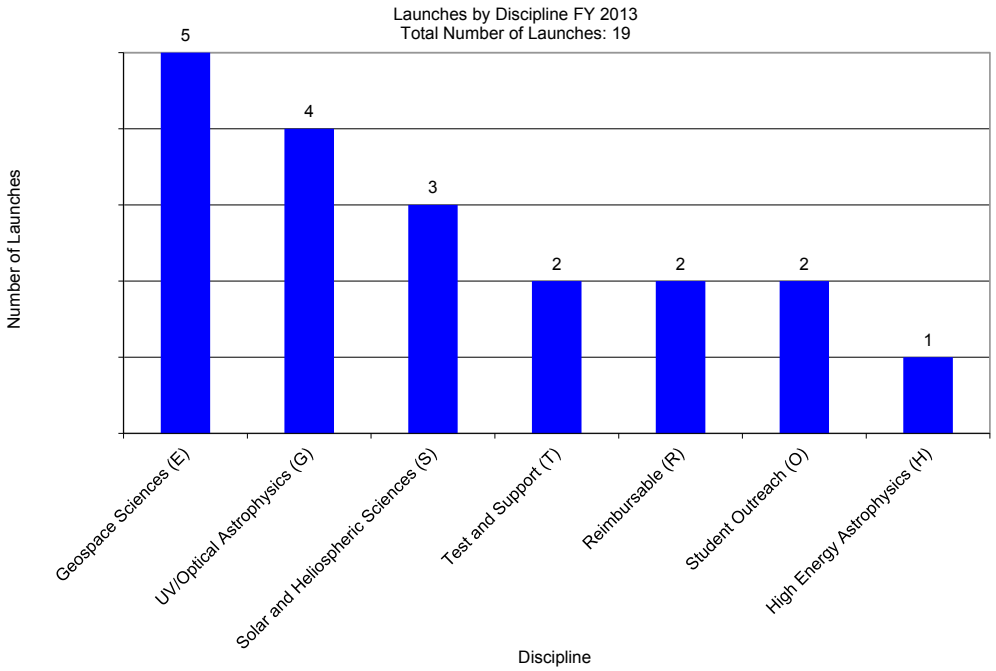
Launches FY 2013



A total of 19 launches were conducted in FY 2013.

Rocket Display at BWI

A Terrier-Orion sounding rocket is on display at the Baltimore-Washington International airport (BWI).

The installation was completed by NSROC II employees Mark Hylbert and Bill Payne.