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Rocket report

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Sounding Rockets Program Office

In Brief...

The Sounding Rocket Working Group (SRWG) meeting was held at Wallops on February 24, 2010. For more information on the SRWG see:

<http://rscience.gsfc.nasa.gov/index.html>

A test flight for the updated Black Brant motor is scheduled to take place at Poker Flat Research Range, AK in April.

NSROC and SRPO personnel are traveling to Kwajalein, Marshall Islands and Woomera, Australia to assess range assets and capabilities for the upcoming launches.

The Wallops Rocket Academy for Teachers and Students (WRATS) education lab is being established in F-7. The lab will host teacher and student workshops for both local and national audiences.



Photo by Lee Wingfield \ Wallops Imaging Lab

36.256 Lift-off from Poker Flat.

36.256 Bailey – PolarNOx launches from Poker Flat, Alaska

A Black Brant IX vehicle, carrying the PolarNOx experiment from Virginia Polytechnic Institute (Virginia Tech) was launched from Poker Flat Research Range in Alaska on February 5, 2011. The Principal Investigator is Dr. Scott Bailey/Virginia Tech.

The purpose of Polar NOx experiment was to measure the concentration of nitric oxide in the mesosphere and lower thermosphere in the nighttime polar region.

36.257 Green – FIRE launches from Poker Flat, Alaska

The Far-ultraviolet Imaging Rocket Experiment (FIRE) from University of Colorado launched from Poker Flat, Alaska on January 28, 2011.

FIRE imaged the spectral region ~900~1100 Å which has been unexplored astronomically. This imaging band will help fill the current wavelength imaging observation gap existing from ~620 Å to the Galaxy Evolution Explorer (GALEX) band near 1350 Å.



Photo by Lee Wingfield \ Wallops Imaging Lab

36.257 staging.

Continued on page 2.

FIRE continued...

Demonstration of the usefulness of the FIRE wavelength band will lead to the development of space-based missions that could find and study quasars, star forming regions and galaxies, and other UV bright objects.

Combining this information with UV and visible wavelength data from other missions and comparing the spectral colors to stellar evolution models will help with the determination of the star formation history. Studying the light of a nearby galaxy will help us understand the redshifted light arriving from galaxies farther away. When performed over many galaxies at differing redshifts, the star formation history of the universe can be directly studied.

The Principal Investigator is Dr. James Green/University of Colorado.



The Whirlpool Galaxy imaged by the Hubble Space Telescope.
Photo credit: NASA, ESA, S. Beckwith (STScI), and The Hubble Heritage Team (STScI/AURA)

The first flight of FIRE imaged star forming regions within the Whirlpool galaxy (M51). Star formation typically produces the hottest, brightest types of stars, O stars, 30,000–50,000°C. The emission peaks of O stars are within the FIRE waveband and constitute a majority of all the observed light emitted at these wavelengths. Therefore, the 900–1100 Å band provides the most sensitive indicator of young, massive stars.

The Whirlpool galaxy is in the northern constellation Canis Venatici. The name refers to the hunting dogs of the herdsman Boötes. Here are a few websites with more information about both the constellation and the galaxy:

http://seds.org/Maps/Stars_en/Fig/canesvenatici.html

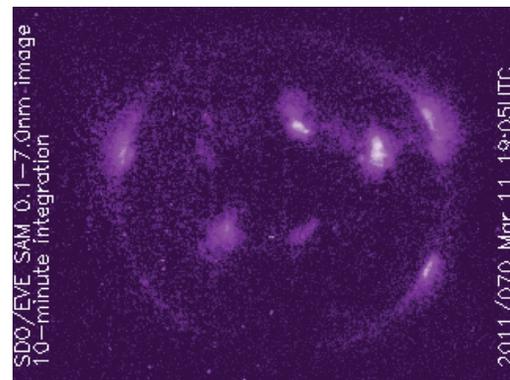
http://starryskies.com/The_sky/constellations/canes_venatici.html

<http://chandra.harvard.edu/photo/constellations/canesvenatici.html>

36.275 UE - Woods launched on March 23, 2011

The primary purpose of this mission is to provide the second underflight calibration for our Solar Dynamics Observatory (SDO) EUV Variability Experiment (EVE) satellite instrument. The SDO launch was on February 11, 2010, and the first underflight calibration flight was on May 3, 2010 with sounding rocket mission 36.258 UE Woods. The Principal Investigator is Dr. Tom Woods/University of Colorado.

The Sun is coming out of the most recent solar minimum and several flares and coronal mass ejections were detected by SDO in early March.



Multiple Euv Grating Spectrograph (MEGS)–SAM image of the Sun. MEGS–SAM is a pinhole camera used with MEGS–A CCD to measure individual X–ray photons in the 0.1 nm to 7 nm range. MEGS–SAM is one of the sub–systems onboard the EVE instrument.

Colorado University Rocket page:



http://lasp.colorado.edu/rocket/rocket_home.html

Visit the SDO page a NASA Goddard Space Flight Center for up to date information on solar activity:

<http://sdo.gsfc.nasa.gov/>



Visit the Living with a Star program for information on Heliophysics research:

<http://lws.gsfc.nasa.gov/>



Education and Outreach programs about Sun–Earth connections:

<http://stargazers.gsfc.nasa.gov/>



Integration and Testing

Chakrabarti 35.225 – Planet Imaging Concept Testbed Using a Rocket Experiment (PICTURE)

By Dr. Chakrabarti/Boston University

The Planet Imaging Concept Testbed Using Sounding Rocket (PICTURE) takes the first step towards direct imaging of exoplanets using nulling interferometers. It is a collaboration between Boston University (BU), Jet Propulsion Laboratory (JPL), NASA Goddard Space Flight Center (GSFC) and Charles Stark Draper Laboratory (Draper). Its original goal was to directly image in visible spectral region Epsilon Eridani b, a Jupiter-like planet in a highly elliptical orbit around a Sun-like star. No other facility, whether ground-based or spaceflight, could achieve this goal. However, due to programmatic difficulties, some of the key components could not be developed in a timely fashion, which made it impossible to attain the original goal.

Nonetheless, PICTURE can image the debris disk around Epsilon Eridani which are similar to the asteroid belt of our Sun. Such information will tell us about the process of planet formation around stars. PICTURE will flight qualify several key technologies necessary for exoplanet exploration such as, extremely light-weight mirror, visible nulling coronagraph, deformable mirror and 0.5 milli arc-sec pointing. Validation of even one of these technologies would be uncommon for most sounding rockets.

Many people contributed to the development of PICTURE, but none more so than two graduate students from Boston University. Christopher Mendillo developed the fine pointing system, flight software and acted as the lead for instrument development. Brian Hicks led the optics alignment, debugging, testing, calibration and validation. They both continue to be the BU representatives on test and integration activities at WFF.



Mr. Wallace and Dr. Rabin, both from Goddard Greenbelt campus with the PICTURE mirror in 2007.



Christopher Mendillo and Larry Mannel with the PICTURE payload with the mirror installed.



Dr. Tim Cook and Andrew Mandigo posing with the shutter door.

Rocket Report

Picture Place...

- ① What? This is not Hawaii???
- ② Sunrise.
- ③ Katie Ford and Libby West.
- ④ Recovery of the Bailey payload.
- ⑤ Bailey payload returns to the range.
- ⑥ Darla Theisen and Brian Cunningham releasing met balloons.
- ⑦ Aurora

Photos by Lee Wingfield/
Wallops Imaging Lab



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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April
36.278 GT BRODELL/NASA-WFF FB

June
41.096 GP HALL/NASA-WFF WI
21.140 GE PFAFF/NASA-GSFC WI
21.141 GE PFAFF/NASA-GSFC WI
41.090 GE PFAFF/NASA-GSFC WI
41.091 GE PFAFF/NASA-GSFC WI
41.095 UO KOEHLER/UNIV. OF COLORADO WI

July
41.092 UO ROSANOVA/NASA-WFF WI

August
36.253 US HASSLER/SWRI WS
12.074 GT HALL/NASA-WFF WI

September
36.263 US JUDGE/USC WS
36.260 UG COOK/BOSTON UNIVERSITY WS
36.264 UH MCCAMMON/UNIV. OF WISCONSIN WS
36.274 UH CASH/UNIV. OF COLORADO WS

From the Archives...

Rockets ready to study the total eclipse of the Sun in March 1970. Several Nike boosted vehicles were flown, including Nike Apace, Nike Cajun, Nike Tomahawk and Nike Iroquois.

