National Aeronautics and Space Administration

Rocket Report

2018

Sounding Rockets Program Office

What's inside...

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Happy Holidays!

35.039 & 35.040 GE Rowland - VISualizing Ion Outflow via Neutral atom imaging during a Substorm (VISIONS) 2 starts the Grand Challenge Initiative (GCI) - CUSP with launches from Ny-Ålesund on December 7, 2018

The Grand Challenge Initiative (GCI)- Cusp is an international collaboration to explore the polar cusp—where Earth's magnetic field lines bend down to meet the poles and particles from space can enter our atmosphere. The CUSP project aims to determine the multi-scale physics of heating and charged particle precipitation in the ionosphere specific to the geomagnetic cusp region.

Composite image of two VISIONS–2 rockets taking off from Ny–Ålesund, Svalbard, Norway.

VISIONS-2 was the first mission to launch two rockets as part of the GCI and studied the outflow of low-energy O+ from the magnetic cusp to the magnetosphere. This outflow modifies reconnection rates, substorm onset mechanisms, radiation belt loss and energization processes.

The mission attempts to answer science questions such as:
What are the processes that drive the low-altitude seed population —soft electrons vs. Joule heating?
How temporally variable ("bursty") is the outflow?
What is the spatial extent ("patchiness") of the outflow?

The two payloads, launched 2 minutes apart, flew through the magnetic cusp to provide high spatial and temporal resolution images of outflow. VISIONS-2 used Energetic Neutral Atom imaging to determine arrival angle, fluence, and energy of energetic neutral atoms, from which energetic ion outflow can be reconstructed.

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52.003 & 52.004 UE Kletzing - Twin Rockets to Investigate Cusp Electrodynamics (TRICE) 2 second up for GCI - CUSP studies launched on December 8, 2018.

Composite image of two TRICE–2 rockets taking off from Andoya Space Center, Norway.

The primary objective of this mission was to measure cusp signatures of reconnection occurring at the magnetopause during steady IMF Bz southward conditions. This was accomplished by launching two nearly identically instrumented payloads, flying at low and high altitudes, with a variety of separations in time and space. The two TRICE-2 payloads were launched 2 minutes apart. Both rockets reached apogee as near simultaneously as possible.

Pictures from Norway

36.331 UG Green/University of Colorado - Dual-channel Extreme Ultraviolet Continuum Spectrograph (DEUCE) - Launched December 18, 2018

The DEUCE mission was launched from White Sands Missile Range, NM on December 18, 2018. DEUCE was designed to directly measure the amount of the Lyman continuum (LyC) radiation that is being produced by early B stars in our own galaxy, the Milky Way.

One of the major questions for modern astrophysics is how and when galaxies first formed and how did their formation "feedback" into their circumgalactic environments to modify early galaxy formation during the Epoch of Reionization at z = 6—11.

This DEUCE flight observed Epsilon Canis Major (εCMa), one of only two non-white-dwarf stars in our own galaxy known to have a sufficiently low neutral hydrogen column density to measure their ionizing radiation directly. The other star is Beta Canis Major (ßCMa.

DEUCE team at White Sands Missile Range.

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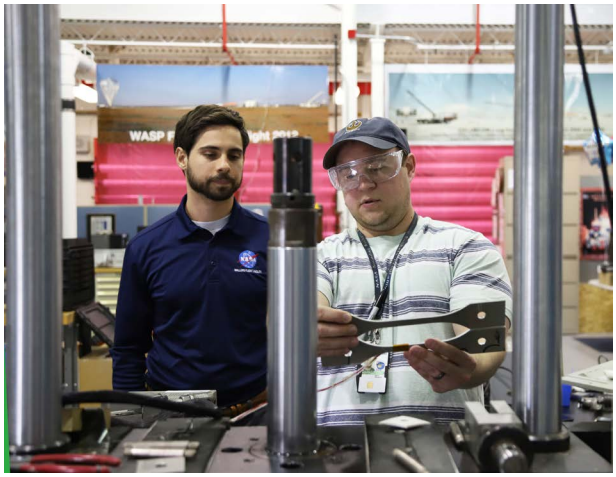
Picture Place

Rob Marshall setting up for a bend test.

We made chili...

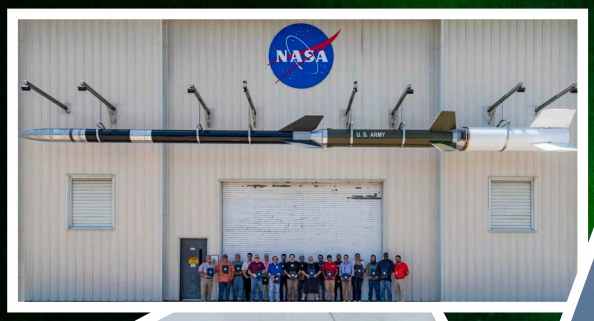
and we ate some!



Santiago and Nate working in the Balloon test facility.

Joe Schafer addesses NSROC staff.

2018 Pictures and Poetry



Field Notes

Twas the week before Xmass staged on the rail
Favorable forecast received via email

Edwards is jolly with low wind forecast
The winds have played havoc on days past

Horizontal, vertical, then on to hot
Team poised and ready to show what they got

At that time when Lupe calls three-two-one
Away the bird goes but not quite done

MK70 booster burns to its end
Separation complete dynamic pressure to blend

S-19 guides from Freddie's command
MK4 ignites with power on demand

Despin, separation, shutter door opening up
Time for ACS with support from Cliff and Kup

On target and happy as data we collect
Physics and science we are here to detect

Through science and discovery the door comes to a close
All in blockhouse and VAB remain on their toes

Chute deploy and drift down to the white sand
Another success expected in hand

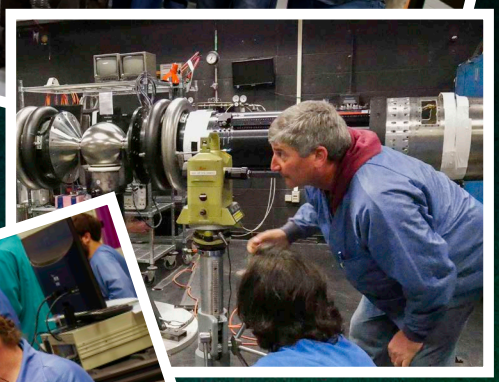
Out for recovery into the air
Blackhawks depart two of a pair

Dr Green is content after many a try
Science to discover from the vast sky

Packing and shipping it's time to go
The mission has tested but has been a good show

This one is over and our goals have been tall
Safe travels and best wishes to one and all

Happy Rocket Holidays!



Background Image: Tim Wilson/NSROC ACS

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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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Launch Schedule January – March 2019

MISSION	DISCIPLINE	EXPERIMENTER	INSTITUTION	PROJECT	RANGE	DATE
52.005 UE	GEOSPACE SCIENCES	LABELLE	DARTMOUTH COLLEGE	CAPER-2	NOR	01/02/19
46.018 UO	STUDENT OUTREACH	KOEHLER	UNIV. OF COLORADO	RockSat-XN	NOR	01/10/19
51.001 UE	GEOSPACE SCIENCES	LARSEN	CLEMSON UNIVERSITY	AZURE	NOR	03/23/19
51.002 UE	GEOSPACE SCIENCES	LARSEN	CLEMSON UNIVERSITY	AZURE	NOR	03/23/19

WS - White Sands
WI -Wallops Island
NOR - Andoya, Norway
FB - Fairbanks
Kwaj - Kwajalein, Marshall Islands
SVAL - Svalbard, Norway

Launches by discipline January – December 2018