The calendar year ends with four successful launches.

Solar Dynamics Observatory calibration mission launched on October 21, 2013.

The primary objective for this mission was to provide an underflight calibration for the EUV Variability Experiment (EVE) aboard the NASA Solar Dynamics Observatory (SDO) satellite. The EVE program provides solar EUV irradiance data for NASA's Living With the Star (LWS) program, including near real-time data products for use in operational atmospheric models that specify the space environment and to assist in forecasting space weather operations. The EVE program advances understanding of the physics of the solar EUV irradiance variations on time scales from flares to the solar cycle. This progress, which includes providing better predictions, results from simultaneous measurements of the solar EUV irradiance and full Sun images of magnetic fields and brightness at wavelengths emitted from the chromosphere, transition region, and corona, which are obtained by other SDO instruments.

For more information, see: http://www.nasa.gov/mission_pages/sounding-rockets/index.html
X-ray Quantum Calorimeter,
36.294 UH McCammon
launched on November 4, 2013

The XQC mission investigated
the spectrum of the diffuse x-ray
emission from the interstellar
medium over the energy range
from 0.1 to 1.0 keV. Observations
in this energy range have shown
that the interstellar medium (ISM) in
our Galaxy contains large amounts
of previously unsuspected hot
gas in the 1 million to 3 million
degree temperature range. This
gas can have profound effects
on the structure and evolution of
galaxies, and plays a key role in
the distribution and life cycle of
the elements produced deep in
the interiors of stars. Despite its
importance, this hot component of
the ISM is still poorly understood.
This was the third flight of the XQC
instrument.

For more information on XQC, please visit:
http://www.nasa.gov/content/yes-there-is-
activity-in-the-darkness-of-space/

36.296 UG McCandliss - Far-Ultraviolet Off-Rowland
Telescope for Imaging and Spectroscopy (FORTIS) launched
to study Comet ISON.

The second flight of FORTIS
for calendar year 2013 studied
Comet ISON. In a very fast turn
around mission the science team
reburbished the instrument after
the first flight in May 2013 and by
November the payload and the team
were ready to fly again, this time to
study ISON.

The goal of this mission was to
acquire imagery and spectra of the
sungrazing Oort cloud comet ISON,
in the far-UV bandpass between
800 – 1950 Å over a 0.5 degree field-
of-view (FOV), during its ingress
towards perihelion. Of particular
interest is addressing the question of
whether Oort cloud comets carry a chemical composition similar to the proto-stellar
molecular cloud from which the Solar System formed. Sounding rockets can make
unique far-UV observations at solar elongation angles as low as 25 degrees when
volatile output is beginning to rapidly increase. In comparison, the Hubble Space
Telescope (HST) has a solar elongation limit of 50 degrees.

For more information on FORTIS see:
http://www.nasa.gov/content/goddard/six-
minute-journey-to-study-comet-ison/

36.261 UG Clarke - Venus Spectral Rocket (VeSpR)
launched on November 26, 2013.

The goals of this project are to obtain a high
resolution spectrum of the Hydrogen (H)
and Deuterium (D) Lyman-alpha emissions
from the atmosphere of Venus, and thereby
determine the D/H ratio at the top of Venus’
atmosphere, and to obtain an H / Lyman-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 of
the history of water on Venus. Venus must be
observed near elongation, when it appears
farthest from the Sun on the sky.

For more information on VeSpR see:
http://www.nasa.gov/content/venus-
spectral-rocket-launches-in-late-november/

VeSpR on the balancing table at Wallops.

XQC team with payload at White Sands.
Integration and Testing

36.287 UE Samara - Ground-to-rocket Electrodynamics-Electrons Correlative Experiment (GREECE)

The GREECE mission will investigate the electrodynamics associated with the most dynamic, fluid-like auroral structures that occur at substorm onset using a sounding rocket. In addition to the rocket, the science closure will depend on heavy use of supporting ground-based optical auroral imaging at downrange sites, under the payload trajectory. The primary objective of this mission is to measure the precipitating electrons with high temporal resolution (1 ms) using two separate detectors focusing on low to mid energies (50 eV to 30 KeV) and high energies (5 keV to 160 keV). The in situ electric and magnetic fields will be measured with high time resolution, at both DC and high frequency. An ion detector will also be flown as a technology demonstration.

Driving Science Questions are:

1) Do large amplitude (≥500 mV/m) convergent electric field structures exist at low altitudes (< 500 km altitude) in the ionosphere? If so, what are their amplitudes and are they responsible for driving the rapid (≥10 km/s) fluid-like shear motions of auroral structures?

2) What are the precipitating electron spectra responsible for auroral curls and do they show evidence of either parallel potential drop or Alfvén wave acceleration?

3) How accurately can we predict the energy of the electrons causing auroral curls based on emission line ratios observed on the ground with high spatial (≤150 m) and temporal (≥30 Hz) resolution?

This project sets out to image the auroral structures from downrange sites with multiple narrowfield and all-sky imagers. Different wavelength filters will be used in each imager in order to derive the precipitating electron energy from the emission line ratios. The aurora will be imaged simultaneously with the conjugate high resolution in situ rocket measurements of the actual precipitating electrons and electric fields.
Frank and Christian working on GREECE — Justin...

Coordinated — Belinda, Cliff, Brian and Justin with VeSpR.

Dave and Rob with procedures.

Terri working on the GREECE payload.

Tom preparing VeSpR for Testing and Evaluation.
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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or

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Schedule 2014

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