



## What's inside...

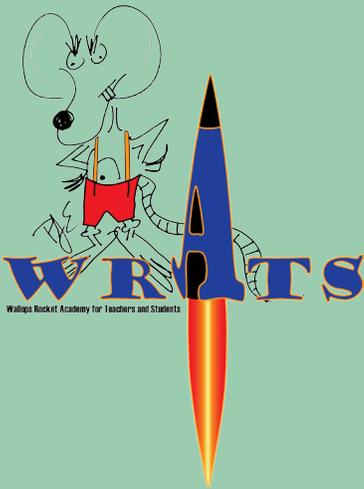
- 2 Features
- 3 Integration and Testing
- 4 Picture Place
- 5 Schedule & Miscellanea

# Rocket report



Sounding Rockets Program Office

## In Brief...



It's time to sign up for WRATS! The Wallops Rocket Academy for Teachers and Students (WRATS) provides **high school educators** with a technical flight experience that will reinforce science, technology, engineering and mathematics (STEM) concepts. WRATS provides an authentic, hands-on rocketry experience based on NASA's sounding rocket engineering and science data collection. WRATS will be held at NASA GSFC Wallops Flight Facility, June 20 – 24, 2016. Teachers interested in attending WRATS should contact Linda Sherman, by email at [Linda.A.Sherman@nasa.gov](mailto:Linda.A.Sherman@nasa.gov).

### 36.297 UG France - Colorado High-resolution Echelle Stellar Spectrograph 2 (CHESS-2) launched February 21, 2016

36.297 UG France was successfully launched from White Sands Missile Range, NM on February 21, 2016. This was the second flight for CHESS. The first flight, also a success, was flown in 2014.

CHESS studies translucent clouds in the interstellar medium (ISM) by analyzing the ultraviolet absorption spectra of the two most abundant molecules, molecular hydrogen H<sub>2</sub> and CO, in the ISM. Scientists will use this data to study where planets like Earth came from by determining the raw materials available as building blocks. Additionally, high-resolution absorption line spectroscopy of the sightlines towards hot stars, in this case Lambda Ori, provides diagnostics to measure the temperature, composition, and velocity fields in the solar neighborhood. Lambda Ori, Orion's Head, is a hot star located in the center of a relatively spherical HII region. This region is ionized due to  $\lambda$  Ori and expanding into the cool, star-forming interstellar dust around it. The CHESS bandpass 1000-1600 Å is in the ultraviolet part of the electromagnetic spectrum.



Image Credit: White Sands Missile Range

CHESS-2 team with rocket at White Sands.

For more information, see:

<http://www.nasa.gov/feature/chess-2-studying-the-birthplace-of-stars-and-planets>

# Rocket Report

## 46.011 GP Milliner - Multiple User Suborbital Instrument Carrier (MUSIC) launched on March 1, 2016

The purpose of the MUSIC mission was to allow NASA Applied Engineering and Technology Directorate (AETD) personnel to gain experience in developing sounding rocket technology, conduct systems engineering



MUSIC launches from Wallops Island, VA.

processes and test NASA AETD experiments. This mission resulted in a standard payload carrier with predefined mechanical, telemetry, power and attitude control capabilities to offer to reimbursable customers and other Wallops Flight Facility developments.

The payload carried experiments/instruments developed by AETD and included, High Data Rate X- Band, Wheel Tracker Experiment (WTE), Diminutive Assembly for Nanosatellite deploYables (DANY) TM Wet/Sealed Nosecone, Temperature and Strain measurement, Strain Gauge Management System (SGMS), Iridium GPS Beacon, and the Solid State Altimeter experiment. Additional experiments from West Virginia University's Undergraduate Student Instrument Project (USIP) included instruments for Plasma Physics and Flight Dynamics with GPS and camera.



Jeff and Terri with MUSIC during integration.



West Virginia University team integrating their experiment.

For more information, see: <http://www.nasa.gov/image-feature/music-successfully-launched-from-nasa-wallops>

## 41.114 NP DeLeon launched on March 7, 2016.

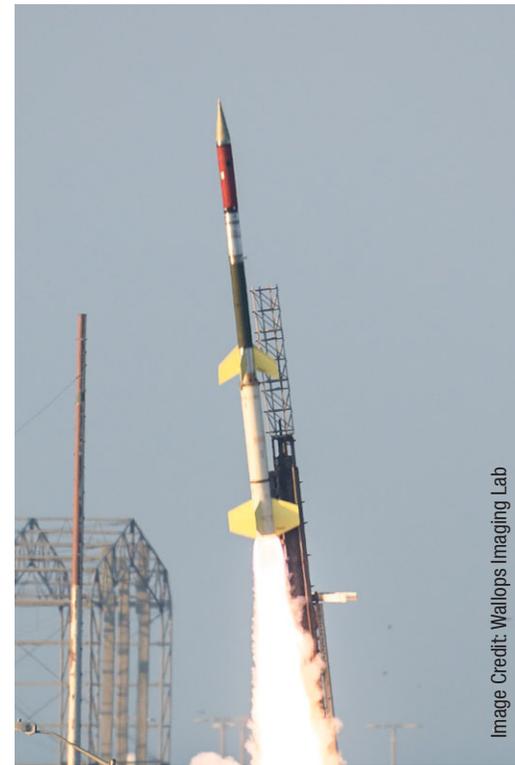


Image Credit: Wallops Imaging Lab

41.114 launches from Wallops Island, VA.

The goals of NASA's Space Technology Mission Directorate (STMD) Flight Opportunities Program include utilization of commercial flight opportunities to facilitate rapid development of Space Technology in support of STMD. STMD also seeks to facilitate the maturation of technology payloads from TRL 4 to TRL 6 through flights that simulate relevant space environments.

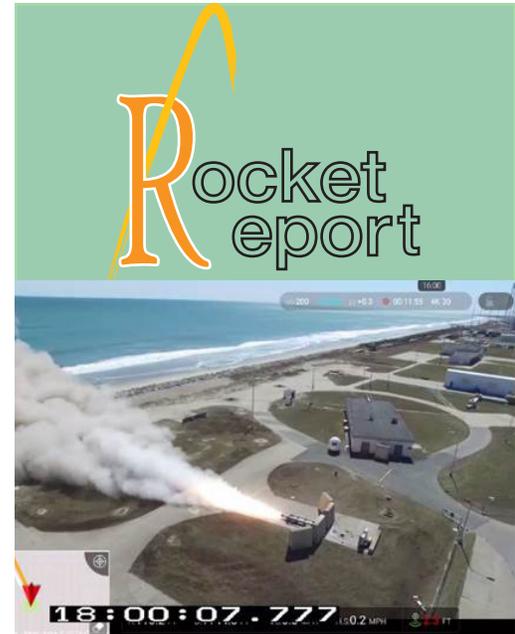
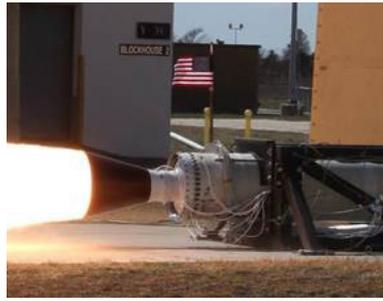
This flight supported three experiments from the Flight Opportunities program. The experiment from Montana State University was a Radiation Tolerant Computer System (RadPC) provided by Brock La Meres. Controlled Dynamics provided a Vibration Isolation Platform (VIP) experiment. Marc Murbach from NASA Ames flew SOAREX9 on this mission. The Principal Investigator is Paul DeLeon/NASA Ames Research Center.

For more information, see: <http://www.nasa.gov/feature/technology-development-focus-of-march-7-rocket-launch-from-wallops>

# Integration, Testing & Static Burn

## Peregrine Static Firing on Pad 2, Wallops Island

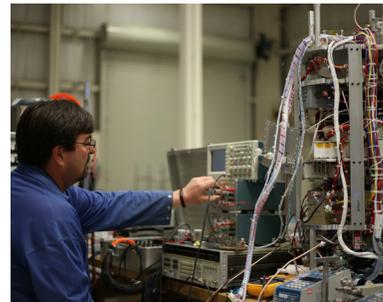
The second Peregrine static burn was conducted on Wallops Island on 3/18/16. A purpose built horizontal restraint cage was utilized to safely retain the motor to the pad. Minor insulation modifications performed on the motor extended the duration of nominal burn by several seconds as expected. The burn through and nozzle ejection were very similar to the first Peregrine firing conducted at MSFC. Good video, photographic, infrared, and instrumentation data products were recorded to further characterize motor performance. The next firing is planned for later in 2016. Modifications to the next motor are expected to further lengthen the duration of nominal burn enabling increased understanding of motor performance.



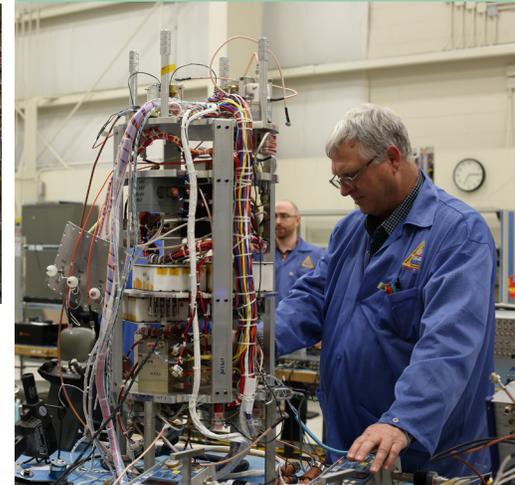
Peregrine static burn. View from a DJI Phantom USA copter cam.

## 36.314 NS Cirtain –High Resolution Coronal Imager (Hi-C)

The High-resolution Coronal Imager (Hi-C) mission scheduled for flight in 2016 is the second flight of this instrument. Hi-C is a pathfinder mission designed to place significant new limits on theories of coronal heating and dynamics by measuring the structures at size scales relevant to reconnection physics. The Hi-C instrument uses normal-incidence Extreme Ultraviolet (EUV) multilayer technology, as developed in the Normal Incidence X-ray Telescope (NIXT) and Transition Region And Coronal Explorer (TRACE) programs. A dual-channel long focal-length telescope and large format back-illuminated CCD camera provide spectroscopic imaging of the corona at 0.1 arcsec resolution. The main objective of the Hi-C investigation is to determine the geometric configuration and topology of the structures making up the inner corona.



Eric (top) and John (right) working on 36.314 NS Cirtain.



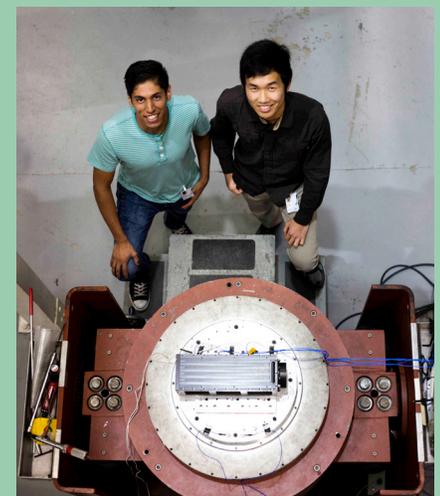
## CubeSat vibration testing



Tommy with the UCLA Cubesat on the vibration table.



UCLA students with their CubeSat.



UCLA students with their CubeSat.

# Rocket report

## Picture Place



Procedures for the DeLeon mission are followed.



Gary making parts for the Pfaff missions.



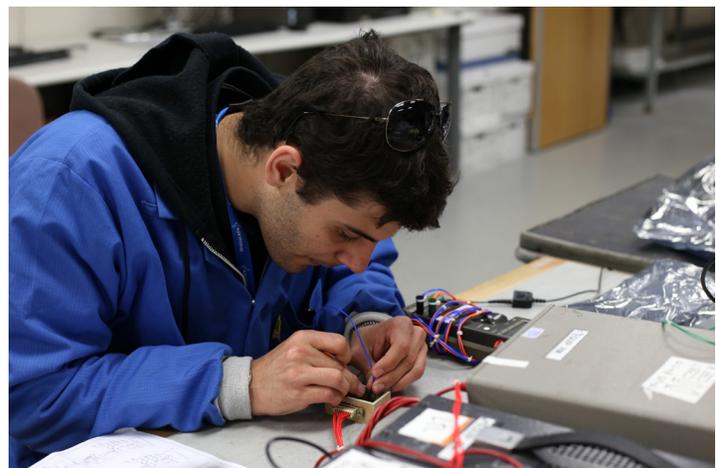
Aaron and Will studying documents.



Interns at work – Teresa and Luke.



NSROC Tin Man Tom and Valerie (not Dorothy).



Ahmed testing electronics.

# Rocket Report

## 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!

Contact:  
 Chuck Brodell  
 Phone: #1827  
 Email: Charles.L.Brodell@nasa.gov

or

Berit Bland  
 Phone: #2246  
 Email: Berit.H.Bland@nasa.gov

## Launch Schedule CY 2016

MISSION	DISCIPLINE	EXPERIMENTER	ORGANIZATION	PROJECT	RANGE	DATE	TIME
36.318 UE	GEOSPACE SCIENCE	WOODS	UNIVERSITY OF COLORADO	SDO EVE	WS	MAY-25	DAY
41.116 UO	STUDENT OUTREACH	KOEHLER	UNIVERSITY OF COLORADO	ROCKON - RockSAT-C	WI	JUN-23	DAY
36.314 NS	SOLAR & HELIOSPHERIC	CIRTAİN	NASA/MSFC	HIC	WS	JUL-18	DAY
46.014 UO	STUDENT OUTREACH	KOEHLER	UNIVERSITY OF COLORADO	RockSAT-X	WI	AUG-16	DAY
46.015 GT	TEST & SUPPORT	HALL	NASA-WFF		WI	OCT-1	DAY
36.309 US	SOLAR & HELIOSPHERIC	HASSLER	SWRI	RAISE	WS	OCT-12	DAY
36.245 UH	HIGH ENERGY ASTROPHYSICS	FIGUEROA	MIT	MICRO-X	WS	NOV-1	NIGHT
36.281 UG	UV/OPTICAL ASTROPHYSICS	BOCK	CAL TECH	CIBER-2	WS	DEC-1	NIGHT
36.317 GP	SPECIAL PROJECTS	HESH	NASA-GSFC-WFF	SUBTEC 7	WI	DEC-13	DAY

WS - White Sands  
 WI - Wallops Island  
 NOR - Norway  
 FB - Fairbanks

## Sharon Truitt retired!

