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Rocket report

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Sounding Rockets Program Office

36.343 Nuth - Determining Unknown yet Significant Traits (DUST) launched October 7, 2019



Image Credit: WSMR

36.343 Nuth team with rocket at White Sands Missile Range, NM.

The purpose of the Determining Unknown yet Significant Traits (DUST) experiment was to measure important variables in the end-to-end process of grain formation in circumstellar outflows around AGB stars and model the physical and chemical properties of the dust. The scientific goal was to determine the most important physical properties controlling dust production and measure the infrared spectrum of the analog dust grains during formation and agglomeration in the laboratory and in microgravity. The DUST instrument included four double wavelength interferometers and two in-situ IR spectrometers.

Rocket Report

46.020 GT Hesh SubTEC-8
launched on October 24, 2019



Image Credit: Wallops Imaging Lab

SubTEC-8 launches from Wallops Island, VA.

SubTEC-8 featured several experiments from NASA and NSROC, designed to test sounding rocket development components and subsystems. The mission objectives included: (1) demonstrate distributed sub-payload to main payload telemetry communication, (2) provide an observation opportunity for a prototype star tracker (3) demonstrate a 40 Mbps telemetry encoder; and (4) provide a test flight opportunity for several sounding rocket development components and subsystems.

36.352 UG McCandliss/Johns Hopkins University - Far-ultraviolet Off Rowland-circle Telescope for Imaging and Spectroscopy (FORTIS) - Launched October 28, 2019 (UTC)



Image Credit: WSMR

FORTIS team at White Sands Missile Range, NM.

FORTIS is a multi-object spectro/telescope equipped with a next-generation microshutter array (NGMSA) capable of imaging individual stars within NGMSA slitlets while simultaneously obtaining their far-UV spectra. The primary science goal for this mission was to study massive hot star clusters in the star-forming Galaxy M33.

This mission measured the far-UV emission stratification of the hot stellar clusters that litter the disk of M33 by quantifying variations in the gas-to-dust ratio, and searching for suspected sources of unidentified emission hinted at by far-UV photometry from the Hubble Space Telescope.

46.029 IE Moen/University of Oslo - Investigation of Cusp Irregularities (ICI) 5 - Launched November 26, 2019

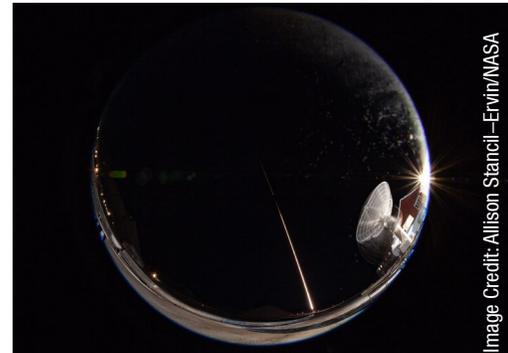


Image Credit: Allison Stancil—Erwin/NASA

ICI-5 launches from Svalbard, Norway.

The Investigation of Cusp Irregularities (ICI) 5 mission was part of the Grand Challenge Initiative - Cusp, an international scientific data sharing partnership.

Andoya Space Center (ASC) was responsible for the overall management of the mission and provided the ICI-5 payload via the University of Oslo, while NASA provided the launch vehicle.

The cusp is a source of local perturbations in the ionosphere and also a source of ionospheric disturbances that propagate all the way to mid and low latitudes. The ICI payload contained a 4D space module that was designed to deploy six daughter payloads. The main payload contained an instrumentation suite provided by a multinational science team that included researchers from Norway, United States, and Canada.

36.349 UE Larsen/Clemson University - Cusp Heating Investigation (CHI) - Launched December 10, 2019.

After waiting diligently for science conditions to be suitable, CHI was launched from Ny Alesund in Svalbard, Norway on December 10, 2019.

The purpose of the mission was to measure neutral upwelling and high-resolution electric fields over an extended region in the cusp. The measurement technique was eight non-ejecting barium/strontium canister releases distributed across the vehicle trajectory above 180 km altitude.

Satellite measurements show consistent evidence of small-scale field-aligned current structure in the region where the cusp neutral upwelling is found. Numerical modeling studies indicate that Joule heating, produced by the small-scale electric field fluctuations associated with this type of structure, appears to be the most likely driver for the upwelling. So far, a sufficiently comprehensive and detailed data set has not been available to test the model predictions.

CHI was designed to allow both plasma drift measurements, obtained from barium clouds that ionize in sunlight, and neutral wind measurements from strontium clouds that remain neutral. Estimates of Joule heating, including the small-scale contributions, are achieved using a combination of the in-situ rocket measurements and groundbased radar data.

Initial reports indicate that all eight Barium releases, and two of the Strontium releases, occurred as planned.

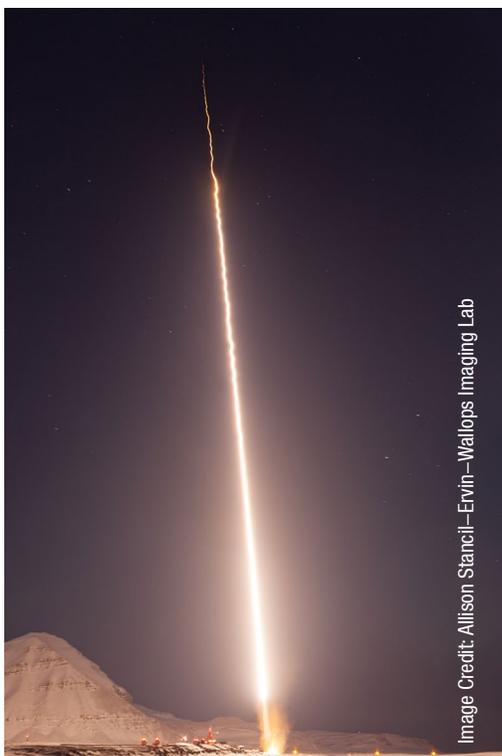


Image Credit: Allison Stancil—Ervin—Wallops Imaging Lab

CHI launches from Ny Alesund, Svalbard.



Image Credit: Allison Stancil—Ervin—Wallops Imaging Lab
CHI mission team.

52.006 UE Conde/University of Alaska - Cusp-Region Experiment (C-REX) 2

Science conditions did not cooperate for the C-REX 2 team this year. After 17 launch attempts, the team is returning home and the mission will be re-scheduled for a later date.

C-REX 2 is designed to identify mechanisms responsible for sustaining a region of neutral mass density at 400km altitude that appears to be a permanent feature of the Earth's cusp-region thermosphere.

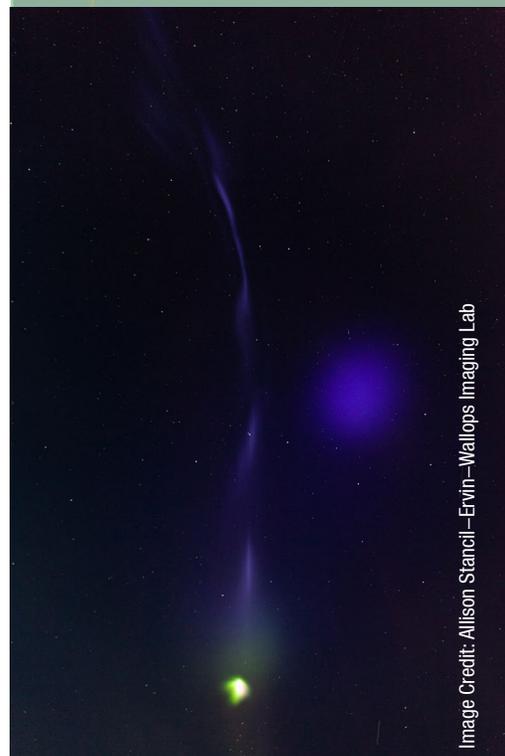


Image Credit: Allison Stancil—Ervin—Wallops Imaging Lab

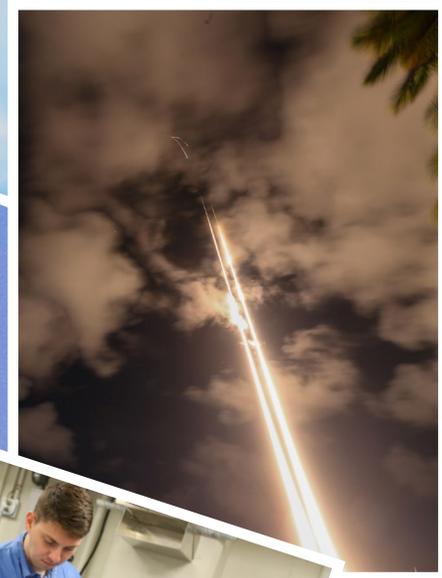
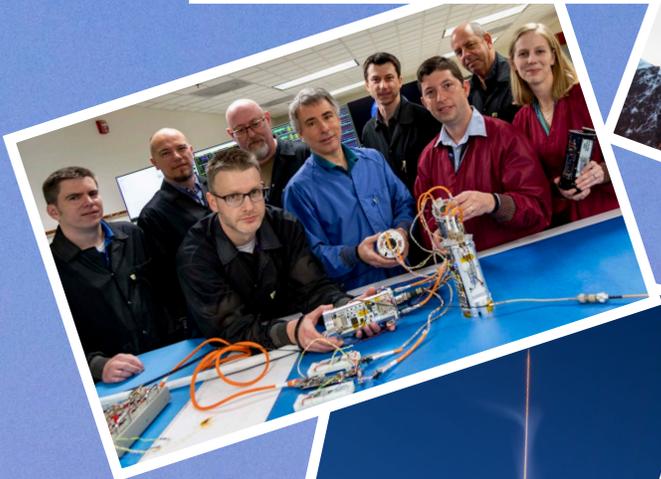
CHI vapor trails.

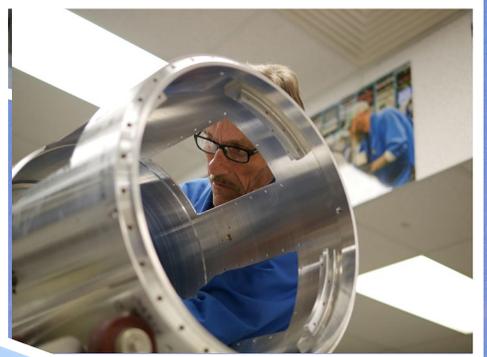


Image Credit: Scott Blum

C-REX 2 sequence testing at Andoya Space Center, Norway.

2019 in Pictures





Launch Schedule January – March 2020

MISSION	DISCIPLINE	EXPERIMENTER	INSTITUTION	PROJECT	RANGE	DATE
36.356 UE	GEOSPACE SCIENCES	BAILEY	VA TECH	PolarNOx	FB	01/26/20
36.281 UG	UV/OPTICAL ASTROPHYSICS	ZEMCOV	RIT	CIBER-2	WS	02/24/20
36.355 UH	HIGH ENERGY ASTROPHYSICS	FIGUEROA	NORTHWESTERN	Micro-X	WS	03/15/20

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

or

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33.062 UE team at White Sands Missile Range, NM in 1993.

