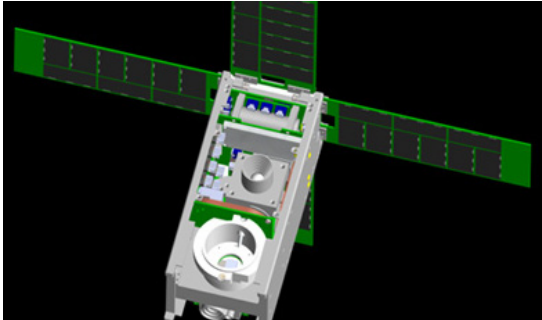




# CUBESAT ELaNa VI LAUNCH ON L-36 Mission



*CXBN was developed and built by Morehead State University in Kentucky. Its primary purpose is to increase the precision of measurements of the Cosmic X-Ray Background in the 30-50KeV range. CXBN also will provide a short-duration supplement to NASA's Radiation Belt Storm Probes mission and is outfitted with state-of-the-art Cadmium Zinc Telluride-based x-ray and gamma-ray detectors.*

## Mission Overview

NASA is partnering with the National Reconnaissance Office (NRO) to launch small research satellites, or CubeSats, for four universities on the third installment of the Educational Launch of Nanosatellite (ELaNa) mission. The Launch Services Program at NASA's Kennedy Space Center in Florida manages the ELaNa missions. The CubeSats will be flown as part of the Operationally Unique Technologies Satellite, or OUTSat, an auxiliary payload aboard the Atlas V 401 rocket scheduled to lift off Aug. 2. Three Poly Picosatellite Orbital Deployers, or P-PODs, will carry and deploy the ELaNa VI CubeSats.

The ELaNa CubeSat Launch Initiative enables university students to obtain hands-on experience and gives private industry access to a low-cost vehicle. Since its inception in 2010, the program has selected more than 60 CubeSats from private and public institutions around the U.S., including six that were launched successfully on the ELaNa III mission. The ELaNa VI CubeSats were chosen from a prioritized list of universities that responded to two public announcements to NASA's CubeSat Launch Initiative in 2011. NASA will announce another call for proposals in mid-August. It will close in November.

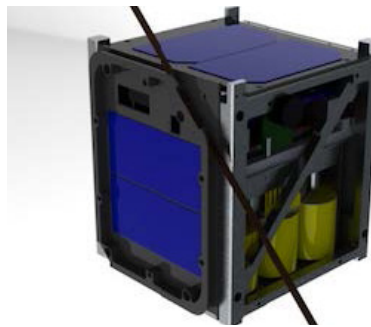
## Basic CubeSat Facts:

- Built to standard dimensions of 1 unit, or 1U, which is equal to 10x10x11 cm
- Can be 1U, 2U, 3U, or 6U in size
- Weigh less than 1 1/3 kg (3 lbs) per U—6U may be up to 12-14 kg
- Deployed from standard Poly-Picosatellite Orbital Deployer (P-POD)

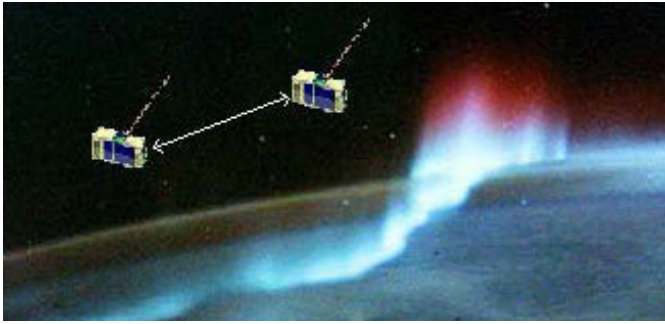
## CubeSat Deployment

Four CubeSat projects were selected for the ELaNa VI mission. The NRO funded the Naval Postgraduate School to develop NPSCuL, which can attach up to eight P-PODs to a single adaptor. This allows up to 24 single-unit (1U) CubeSats to be launched at one time. The CubeSats on OUTSat are sponsored by either the NRO Mission Support Directorate or NASA's Launch Services Program. The P-POD was designed and manufactured by the California Polytechnic State University (Cal Poly) to integrate CubeSats onto the launch vehicle. This P-POD design has flown previously on Defense Department, NASA, and commercial launches. For NASA, Cal Poly integrates the CubeSats with the P-POD and provides the entire assembly to the launch vehicle integrator.

After the main payload deploys, the CubeSats will separate from their P-PODs. After 45 minutes in orbit, the CubeSat transmitters will turn on and university ground stations will listen for their beacons, determine the small satellites' functionality and announce operational status. CubeSat mission durations and orbital life vary, but are anticipated to last at least 180 days. Upon mission completion, the CubeSats fall to Earth, burning up in the atmosphere.



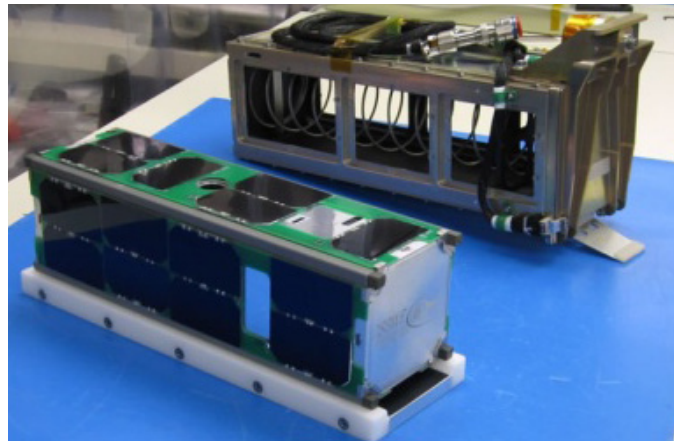
*CP5 was developed and built by the California Polytechnic State University in San Luis Obispo. Its primary purpose is to test a deployable spacecraft de-orbiting a thin-film mechanism consisting of a miniature solar sail. After the sail deploys, observations will be made from the ground to detect any altitude or velocity degradation of the spacecraft.*



*CINEMA was designed and built by the University of California, Berkeley's Space Science Laboratory and funded by the National Science Foundation to conduct magnetospheric science and collect critical space weather measurements. CINEMA will image energetic neutral atoms in the magnetosphere and make onboard measurements of electrons, ions and magnetic fields at high latitudes.*

### **Safety and Mission Assurance**

Each CubeSat developer verified that its satellite complied with the P-POD requirements. NASA conducted mission integration and safety verifications for the CubeSats to ensure that their presence and deployment would not add additional risk to the primary mission. NASA jointly conducted a mission readiness review with each CubeSat developer.



*CSSWE was developed and built by the University of Colorado and funded by the National Science Foundation to perform orbital onboard space weather measurements. The CubeSat will measure the directional differential flux of Solar Energetic Protons (SEPs) and Earth's radiation belt electrons to support the Radiation Belt Storm Probe mission and help to understand the relationship between SEPs, flares and coronal mass ejections.*

For more information about NASA's CubeSat Launch Initiative program, go to: [http://go.nasa.gov/CubeSat\\_initiative](http://go.nasa.gov/CubeSat_initiative)

For more information about the ELaNa VI CubeSats, go to:  
CINEMA: [http://mstl.atl.calpoly.edu/~bklofas/Presentations/DevelopersWorkshop2009/2\\_Science/4\\_Glaser-CINEMA.pdf](http://mstl.atl.calpoly.edu/~bklofas/Presentations/DevelopersWorkshop2009/2_Science/4_Glaser-CINEMA.pdf)  
CSSWE: <http://lasp.colorado.edu/home/csswe/>  
CP5: <http://polysat.calpoly.edu/CP5.php>  
CXBN: <http://ssc.moreheadstate.edu/missions/>  
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