

ELaNa XI CubeSat Launch on AFSPC-5

May 2015

OVERVIEW

NASA will enable the launch of a small research satellite, or CubeSat, for The Planetary Society in Pasadena, California, as part of the eleventh installment of the Educational Launch of Nanosatellite (ELaNa) mission. The LightSail CubeSat is included as part of an auxiliary payload of 10 CubeSats on the upper stage of the Atlas V rocket that will launch the U.S. Air Force X-37B space plane's fourth mission, scheduled to lift off May 20 from Cape Canaveral Air Force Station, Florida, at 10:45 a.m. EDT. This payload is the second flight of the Ultra Lightweight Technology and Research Auxiliary Satellite (ULTRASat). ULTRASat is composed of 10 CubeSats from five organizations.

This is made possible through interagency agreements between NASA, the United States Air Force's Space and Missile Center and the National Reconnaissance Office to work together on CubeSat integration and launch opportunities.

The CubeSat Launch Initiative (CSLI) enables the launch of CubeSat projects designed, built and operated by students, teachers and faculty to obtain hands-on flight hardware development experience. CSLI also provides access to space for CubeSats developed by the U.S. government and non-profit organizations, giving CubeSat developers access to a low-cost pathway to conduct research in the areas of science, exploration, technology development, education or operations. Since its inception in 2010, the initiative has selected more than 100 CubeSats from primarily educational and government institutions around the U.S. These miniature satellites were chosen from a prioritized queue established through a shortlisting process from proposers that responded to public announcements on NASA's CubeSat Launch Initiative. NASA will announce another call for proposals in August 2015.

CUBESAT DEPLOYMENT

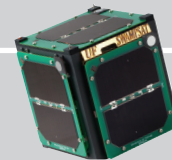
ULTRASat's CubeSats are housed in eight Poly-Pico Orbital Deployers (P-PODs) built by California Polytechnic State University (Cal Poly) in San Luis Obispo, California. The eight P-PODs are integrated into a structure built by the Naval Postgraduate School in Monterey, California. After the main payload deploys, the CubeSat will separate from its P-POD. After 45 minutes in orbit, the CubeSat transmitters will turn on, and ground stations will listen for their beacons to determine the small satellites' functionality and operational status. CubeSat mission durations and orbital life vary, but are anticipated to last at least 90 days. Upon mission completion, the CubeSats fall to Earth, burning up in the atmosphere.

SAFETY AND MISSION ASSURANCE

The LightSail CubeSat developer verified that LightSail complied with the P-POD requirements. NASA also conducted a mission readiness review with them.

Basic CubeSat Facts:

- Built to standard dimensions of 1 unit (1U) which is equal to 10x10x10 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 standardized dispensers



NASAfacts



LightSail team members Alex Diaz (left) and Riki Munakata (right) prepare the spacecraft for a sail deployment test. Credit: The Planetary Society.

LIGHTSAIL

The Planetary Society – Pasadena, California

LightSail is a citizen-funded technology demonstration mission for using solar propulsion for CubeSats. The spacecraft is designed to “sail” on the energy of solar photons striking the thin, reflective sail material. The first LightSail mission is designed to test the spacecraft’s critical systems, including the sequence to autonomously deploy a Mylar solar sail with an area of 32 square meters (344 square feet). The Planetary Society is planning a second, full solar sailing demonstration flight for 2016. Light is made of packets of energy called photons. While photons have no mass, they have energy and momentum. Solar sails use this momentum as a method of propulsion, creating flight by light. LightSail’s solar sail is packaged into a three-unit CubeSat about the size of a loaf of bread.

To contact the ELaNa XI Launch Public Affairs Office, call 202-358-1100

For additional information about the NASA’s CubeSat Launch Initiative, visit: http://go.nasa.gov/CubeSat_initiative

For additional information about the ELaNa XI CubeSats, visit:
LightSail-1: sail.planetary.org

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