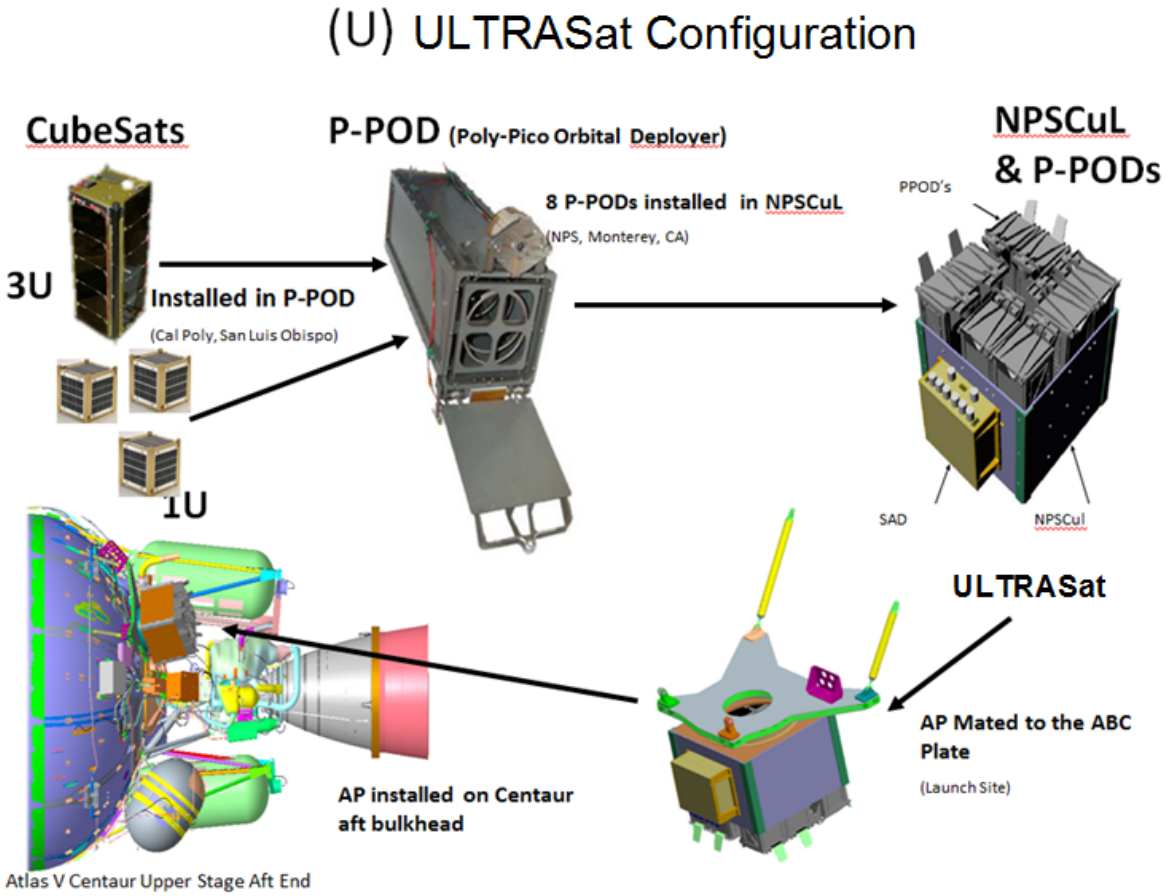
Atlas V AFSPC-5: ULTRASat CubeSat Summary

The Ultra Lightweight Technology and Research Auxiliary Satellite (ULTRASat) consists of 10 CubeSats contained in eight Poly-Pico Orbital Deployers (P-PODs) built by the California Polytechnic State University in San Luis Obispo, CA. The eight P-PODs are integrated into a structure built by the Naval Postgraduate School (NPS) in Monterey, CA. A depiction of the ULTRASat configuration is included. Seven of the eight P-PODs contain a total of nine NRO-sponsored CubeSats while one of the P-PODs has one NASA-sponsored satellite. A brief description of the CubeSats is provided below.



NRO-Sponsored CubeSats

USS Langley:
Developer: U.S. Naval Academy
Configuration: One 3U CubeSat
Mission: The USS Langley satellite's primary objective is to demonstrate the ability to host a web server on a CubeSat which will utilize common TCP/IP internet protocol accessible to any internet user. If proven, there is a potential to use small satellite constellations as networks. The U.S. Naval Academy will also be comparing the internet speed of the space-based network versus terrestrial networks.

BRICSat-P:
Developer: U.S. Naval Academy and George Washington University
Configuration: One 1.5U CubeSat
Mission: BRICSat-P stands for Ballistically Reinforced Communication Satellite – Propulsion Test Unit. The primary mission is to characterize the performance of miniature pulse plasma thrusters, developed by the George Washington University, in the space environment while providing an amateur radio communication service. The U.S. Naval Academy also plans to use the thrusters for attitude control and then to deorbit the satellite at the end of the mission.

Psat:
Developer: U.S. Naval Academy
Configuration: One 1.5U CubeSat
Mission: Psat stands for ParkinsonSat and its primary mission is a communications payload with two transponders operating in the Amateur Satellite Service. One enables handheld texting and position/data reporting between handheld radios almost anywhere on Earth and/or to the internet. The second can support up to 30 simultaneous text users from laptop type portable ground stations.

GEARRS:
Developer: Near Space Launch and Air Force Research Lab
Configuration: One 3U CubeSat
Mission: GEARRS stands for Globalstar Evaluation And Risk Reduction Spacecraft and its primary mission is the demonstrate the use of the Globalstar constellation as a path for near continuous command and control of low-earth orbit space vehicles.

AeroCube -8:
Developer: The Aerospace Corporation, MIT and eSpace
Configuration: Two 1.5U CubeSats
Mission: AeroCube-8's primary mission is to demonstrate NRO-funded research and development products in space. It is a multifaceted technology demonstration mission for novel Carbon Nanotube and Scalable ion Electrospray Propulsion system. Two identical CubeSats will be utilized toward this goal.

Optical CubeSat:
Developer: California Polytechnic State University ("Cal Poly")
Configuration: Three 3U CubeSats
Mission: The "OptiCubes" provide on-orbit targets for ground assets to calibrate sensors for orbital debris studies and small-object tracking improvements.

NASA-Sponsored CubeSats

Lightsail-A:

Developer: Ecliptic Enterprises Corporation, California Polytechnic University San Luis Obispo, Georgia Institute of Technology, Boreal Space, Half-Band Technologies LLC and Stellar Exploration, Inc.

Configuration: One 3U CubeSat

Mission: LightSail is a privately developed solar sail project conceived and led by The Planetary Society. Designed to demonstrate the viability of using solar sailing for propulsion on a small, 3-unit CubeSat, a spacecraft about the size of a loaf of bread, LightSail is embarking on two missions: this shakedown cruise designed to test out the spacecraft's systems and a full-fledged solar sailing flight in 2016. As a non-profit space interest group, The Planetary Society invests in innovative technology to advance space exploration and will leverage citizen-funded LightSail to inform future missions among the space community.