



Long-Standing Notion:

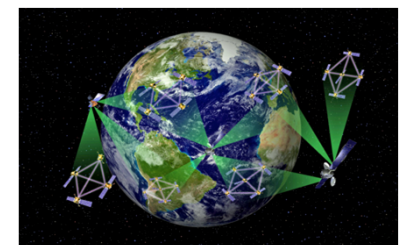
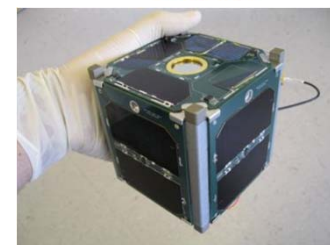
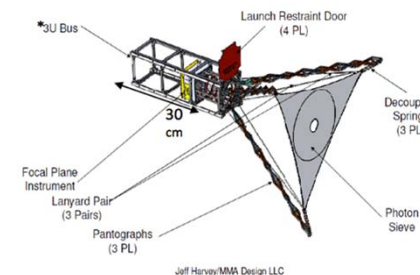
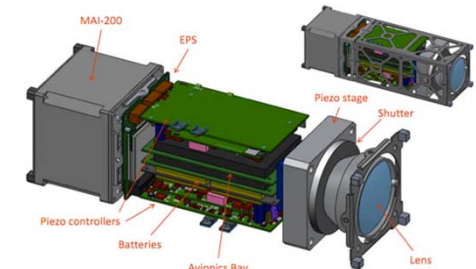
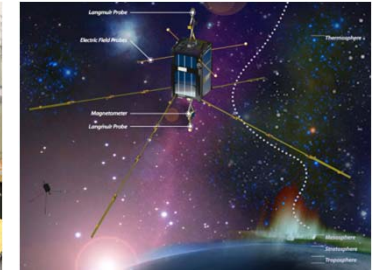
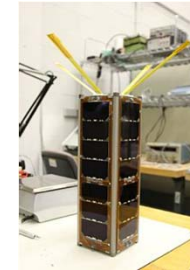
CubeSats do not have sufficient power, payload volume, pointing capability, or downlink data rate to perform valuable science or technology demonstration missions.

That was then. What about now?

Introduction to CubeSats – Example Missions



- Space Weather Science (NSF missions)
- Biological Science (NASA ARC missions)
- Astrophysics (Moorehead States's CXBN)
- Planetary Science (MIT's ExoplanetSat)
- Technology Demonstrations
 - Propulsion / Attitude (Nanosail-D)
 - Imagers (FalconSat-7)
 - Solar Arrays (NPS-SCAT)
 - FPGAs (M-Cubed/COVE)
 - Fractionated Space (DARPA F6)
 - Plug-n-Play architectures (AFRL)

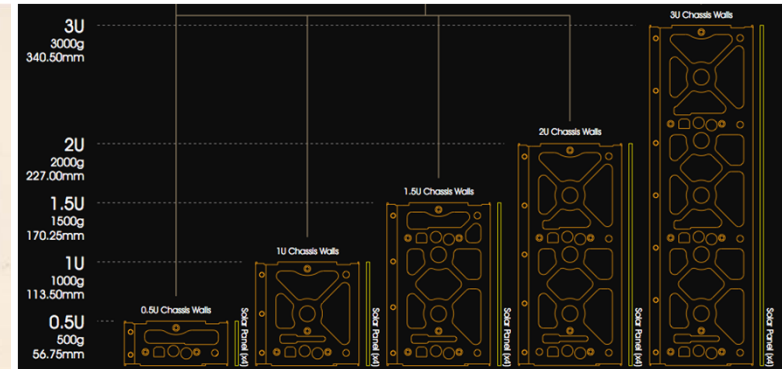
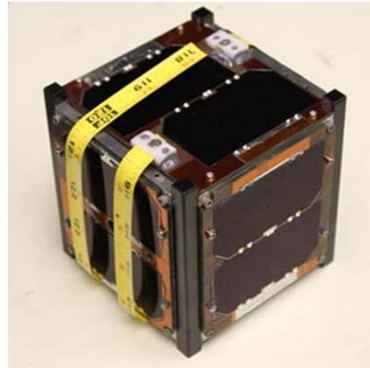


Introduction to CubeSats: Design



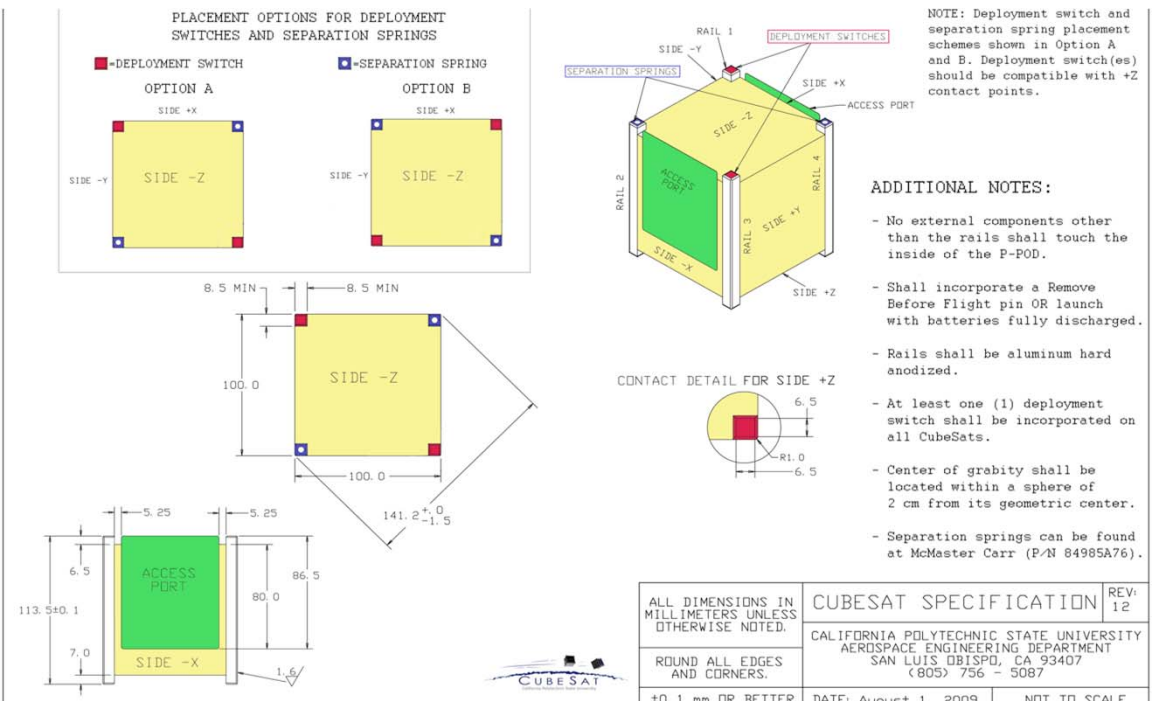
What is a CubeSat?

- Standardized platform for low-cost, frequent access to space as a secondary payload
- Over 50 missions launched to date to Low Earth Orbit (350-850 km range)
- Longest known lifetime: 8 yrs

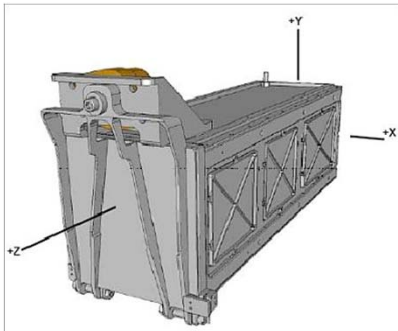


Design

- 1U: 10 cm x 10 cm x 10 cm
- Sizes range from 0.5U to 3U in standard Cal Poly P-POD



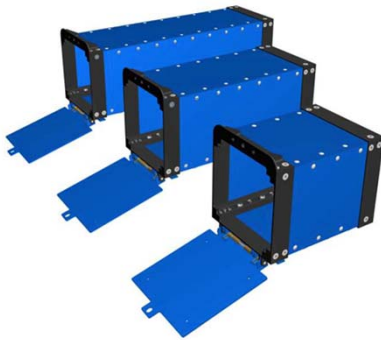
Introduction to CubeSats: Deployment Mechanisms



CalPoly P-Pod (Up to 3U)

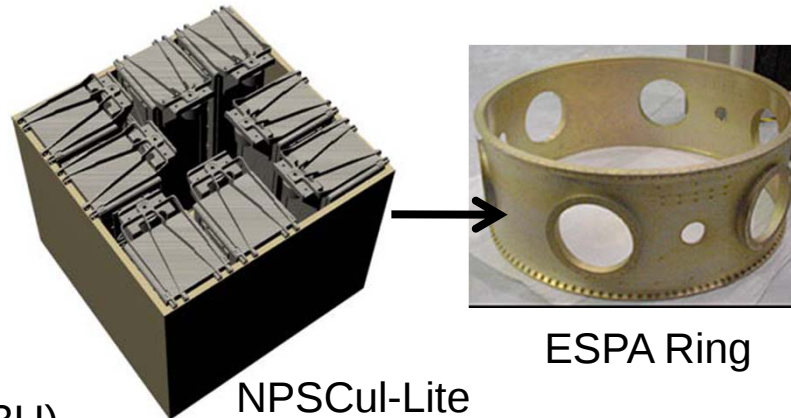


UTIAS X-Pod (1U + Custom)



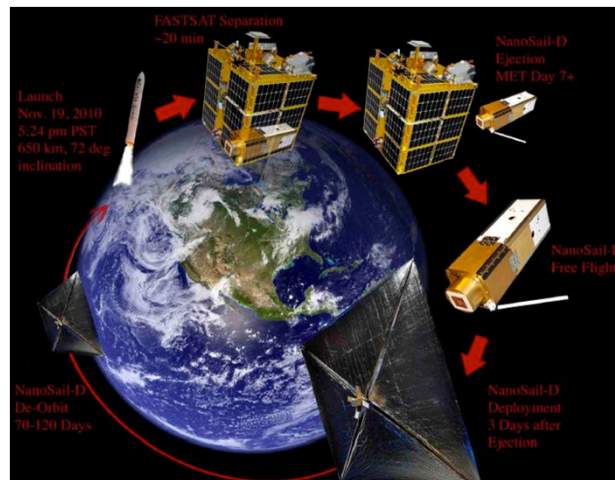
ISIS Pod (1-3U + Custom)

4



NPSCul-Lite
P-Pod (8 x 3U)

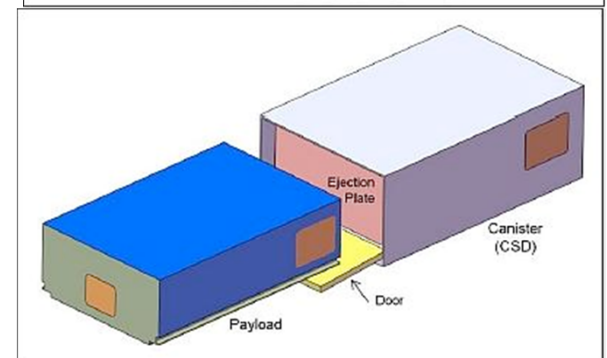
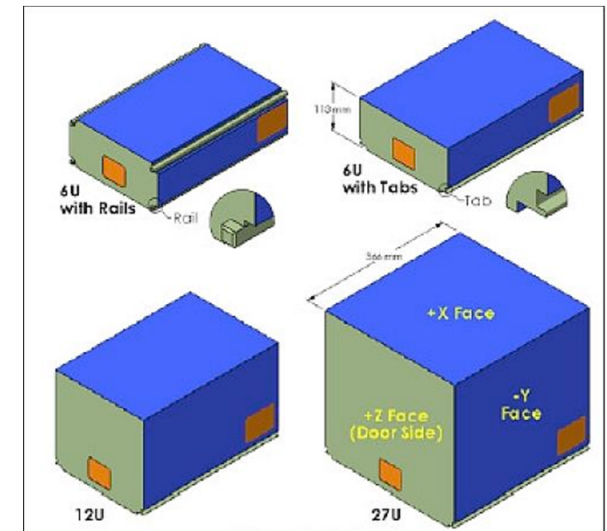
ESPA Ring



P-POD on a Microsat (FASTSAT)

Comments:

Deployment modules do not provide communication or power from LV to spacecraft.



Advanced CubeSat Standard
(6U, 12U, 27U)

Introduction to CubeSats: Technology and Science



Sample Science Missions

- Space Weather Science (NSF missions), Biological Science (NASA ARC missions), Astrophysics (Moorehead States' CXBN), Planetary Science (MIT's ExoplanetSat)

Sample Technology Demonstrations

- Propulsion / Attitude (Nanosail-D), Imagers (FalconSat-7), Solar Arrays (NPS-SCAT), FPGAs (M-Cubed/COVE), Plug and Play Systems (2501)

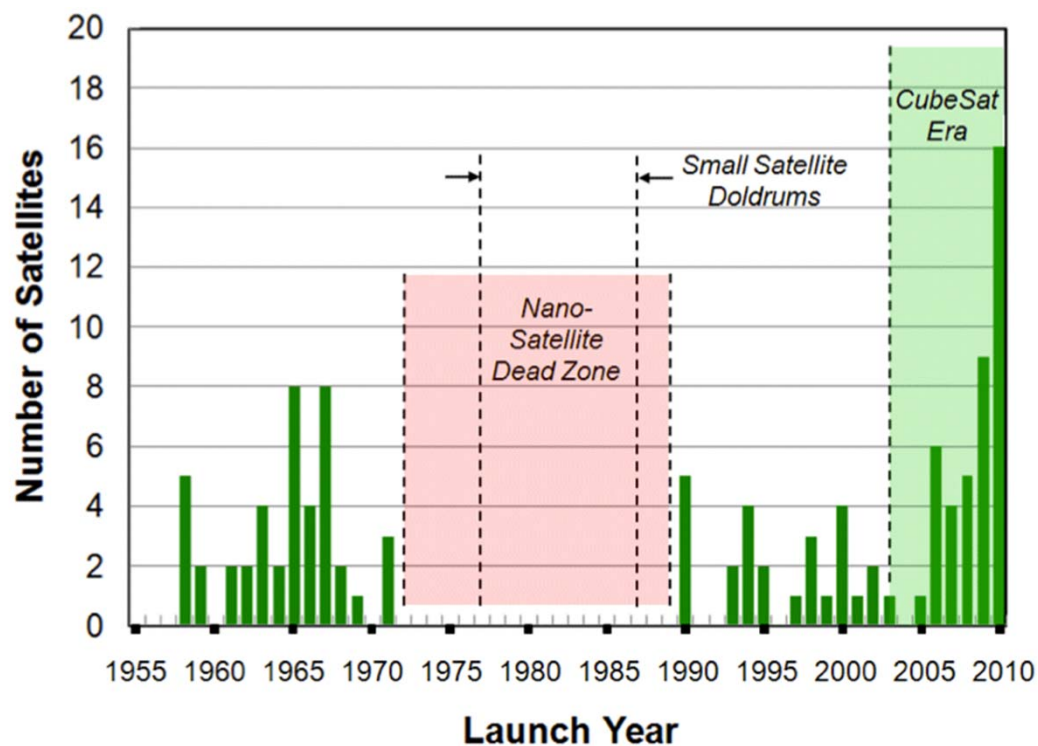


Image Courtesy: Siegfried Jansen

