MOREHEAD STATE UNIVERSITY

The Role of Students in Keck-Class Lunar Missions

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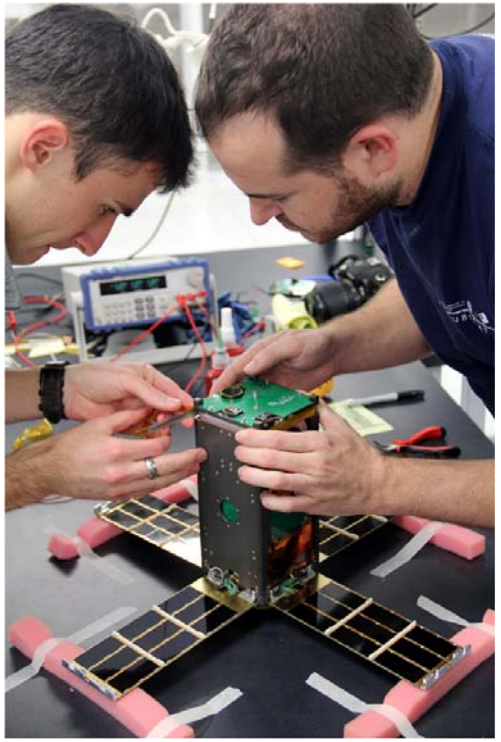


Space Projects Create Opportunities for Students

- **Undergrad and Grad Research Experiences**
- **Participation in Design Studies**
- **Instrumentation Experience**
- **Engineering- Design, Fabrication, Testing**
- **Ground Ops (TT&C)**
- **Project Management Experience**
- **Systems-level Engineering Experience**

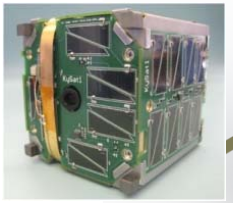
What are Appropriate Roles for Students in Large Scale Space Missions?

- Contextually Dependent
  - Customer
  - Mission Complexity
  - Risk Tolerance

Morehead SmallSat Missions

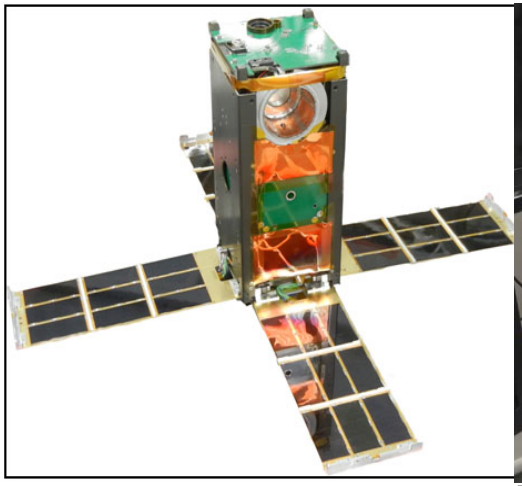
- 1U,2U,3U CubeSats
- Microsat Subsystems
- PocketQubs
- Ground Ops
- Comms Experiments
- GSE Development
- Variety of Customers

KySat-1 Secondary on NASA's Glory Mission

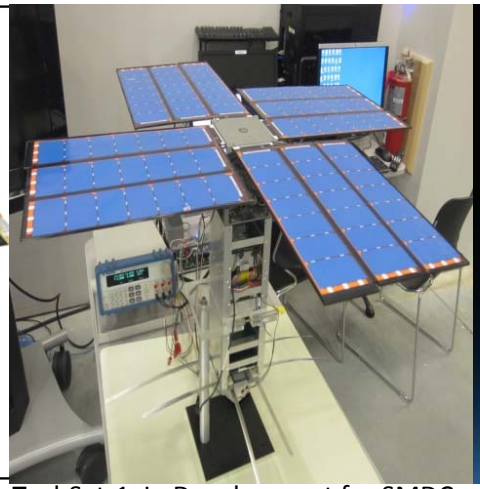


KySat-2 Launches in October 2013

CXBN-2 In Development

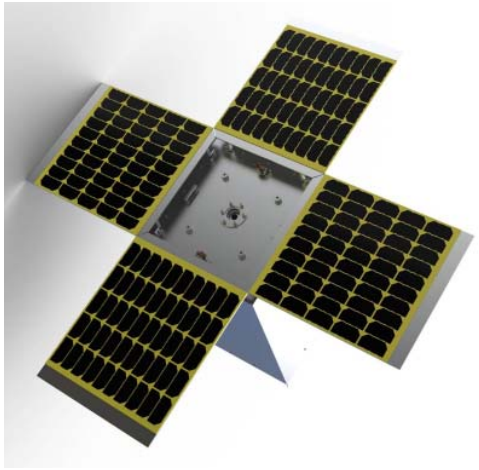


CXBN Launched in 2012



TechSat-1 In Development for SMDC (w/ Honeywell and Radiance)

Standard MSU 3-U Bus



UniSat-5 w/ Univ. of Roma

Ground Segment: Mission Operations

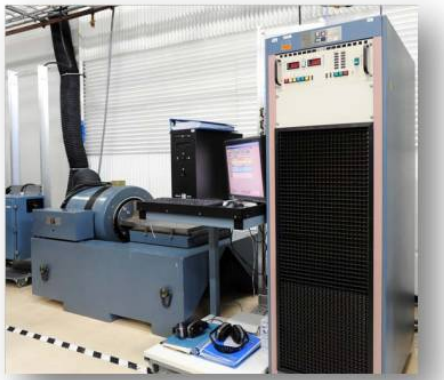
- TT&C
  - Pass Scheduling
  - Downlink Data
  - Uplink Noncritical Commands
  - Orbit Modeling in Support of LEOP

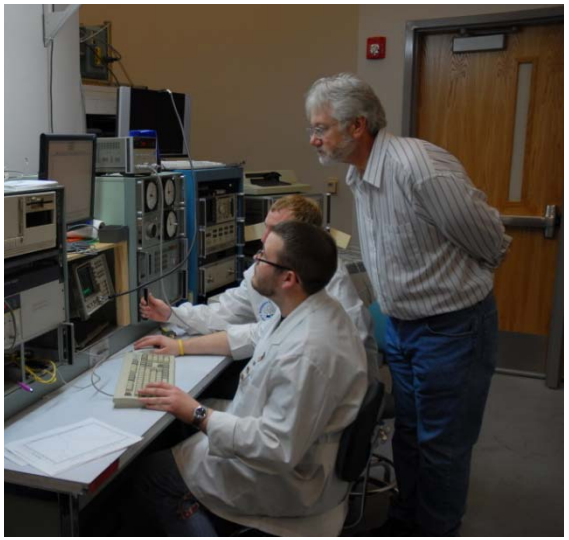
- Mission Operations Control Center (MOC)

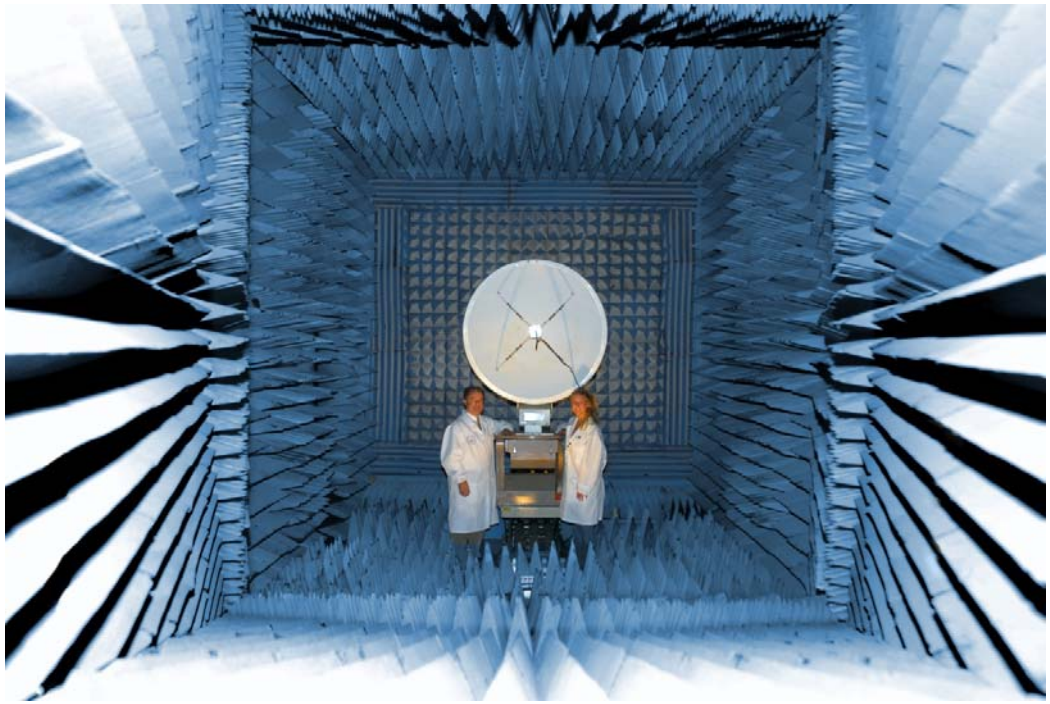
- 21 M Lower Equipment Room (LER)

Space Environment Testing

- Vibe Testing
- T-Vac
- Testing and Characterization of Spacecraft Communication Systems
- EMI and RF Testing of Power Systems
- HWIL and SWIL Testing

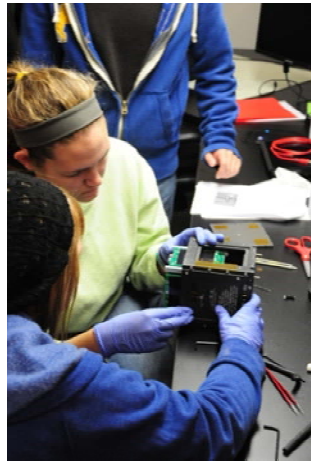


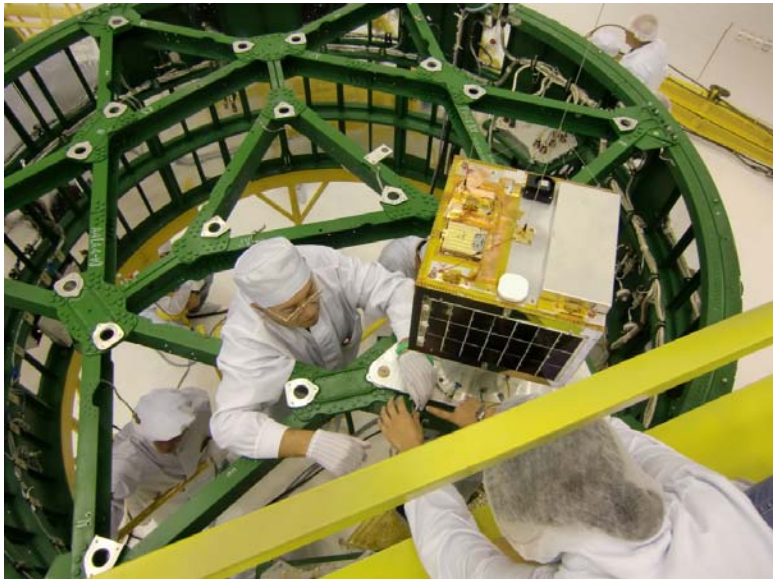




To Some Extent--Spacecraft Development, Assembly and Integration

- System and Subsystem Prototype Development
- Assembly of Noncritical Systems
- FlatSat System Testing
- EM Development
- Interaction with Scientists and Engineers, Vendors, Customers, etc.





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- Kentucky Space
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