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

CXBN-2 In Development

KySat-2 Launches in October 2013

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.
Student Research Supported
Provide By

- NASA (GSFC, MSFC, WFF)
- KY NASA EPSCoR
- NSF
- DoD
- Kentucky Space Grants Consortium
- Kentucky Space
- Johns Hopkins APL