Progress in Lunar Educational Missions

A discussion for UNIVERSAT 2006

The Opportunity

- Past student missions successful in LEO
- Extension to Moon now possible:
- Numerous lunar missions in preparation
- Agency policies favor education
- Micro-technology permits small impact on main missions

Planned and Possible Missions

- ESA SMART-1 Impact, 3 September 2006
- European Student Moon Orbiter (ESMO)
- ISRO Chandrayaan-1
- China Chang-E 1
- JAXA Lunar-A and SELENE; Japanese ground tracking initiative
- NASA LRO with LCROSS
- Russian lunar studies

Cubesats and AMSAT

- Cubesat concept established, flights successful, many more in preparation
- AMSAT has decades of success worldwide
- Analyses show cubesats may be tracked at lunar distance
- Suitsat's weak signal provided a test
- Educational/amateur ground network possible

Possible Mission Concepts

- Launch cubesats from translunar injection stage; e.g., LCROSS, with lunar swingby and return toward Earth
- Launch cubesats during GTO mission phase

Science Experiments

- With limited data rates, science goals must be modest
- However, the educational objective requires that some science be attempted
- Magnetospheric measurements are a practical and useful option

A Note of Caution

- Student auxiliary lunar payloads and other educational activities are technically feasible
- However, project constraints (schedule, resources, risk) will limit what can really be achieved
- Nevertheless, the opportunity deserves attention

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