INTERNATIONAL LUNAR SCIENCE MISSION TO THE DESCARTES FORMATION. **Raupe**[1], **J.C.** (joelraupe@lunarpioneer.com) and **Scott**[2], **L.F.** (lscott708@bellsouth.net); [1]TeamSTELLAR, Advanced Aerospace Resource Center, 504 Ellis Cove, Belhaven, NC, 27810, [2]Lunar Pioneer Group, 1329 Cassidy Road, Camden, SC. 29020.

Introduction: Science deemed essential [1.] before extended human activity on the Moon calls for efficiencies already planned for LRO/LCROSS, GRAIL, LADEE, etc. We study the notion of a Station-Rover, redundant to a node in the International Lunar Network (ILN), to survey regolith and a relatively pristine exosphere in an area of long interest [2.] [3.].

Overview: Survey of South Pole–Aitken Basin is a higher priority, however equatorial sites feature insolation and geomagnetic sweep at highest incidence. Also, *Lunar Prospector* data [4.] indicates a lunar magnetic anomaly (LMA) centered near the north rim of ancient Descartes Crater, with albedo on the Descartes formation to the north. We propose traversal of likely surficial influence by this LMA, across the unique formation ~40 km, shy of Station 4 at Stone Mountain Cincos, and tentative scrutiny of artifacts of Apollo 16.

Our notional mission lands, establishing a fixed ILN node and science station within 2 km of the north rim of 2km *Descartes C* (~16.36° x 10.925°S), which is distinct on the ruined rim of Descartes to the southwest. From the south terminus of the albedo, science begins during a period of ILN calibration, the sampling of outgassing, heatflow and exosphere. As part of the LADEE [5.] "affordability option," the ILN node becomes ground support in detection and characterization of electrostatically charged dust phenomena.

Maximum instrumentation of minimal weight is already proposed in the ILN paradigm [6.]. Doubling this in a rover adds redundancy in a distant robotic network. Descartes could be test ground for the wide distribution of ILN nodes to follow.

Beginning ~10 km east of the "center" of the Descartes LMA (strongest on the nearside) its affect on systems is tested by comparison of data as the rover is moved from node through Descartes Swirl, to Station 4, and gradually emerges from LMA influence.

Descartes formation defies easy explantion, whether or not it is radiant of Nectaris, and the region is apparently suited to dating every lunar epoch. [7.] suggested understanding Descartes may prove definitive to gradual fall off of bombardment or cataclysm.

After redundancy, our notional sensing mission might determine, and to what degree, the Descartes LMA protects the surface from relentless solar particles or lower energy cosmic rays under its "umbrella."

Whether LMAs shield regolith from space weathering is a question that persists. One theory of origin for the Moon's Swirl albedo and their associated LMAs holds them as recent, resulting from encounters with meteor swarms or comets [8.]. In noting some farside Swirl and coincident LMAs are antipodal to nearside basin-forming impacts [4.] attributes these to low optical maturity (OMAT) in regolith shielded by shock-fossilized paleomagnetism, long afterward shielding regolith below from the darkening of space weathering. Despite a demonstrated strength in some LMAs, sufficient to stand off solar wind, LMAs still seem insufficient to delay OMAT throughout ~4 Ba.

We would test one possible cause for the apparent longevity of low OMAT regolith under LMAs with improved understanding of electrostatic dust charging and ballistics. Positive electrostatic charging and levitation of microscopic dust, away from the Descartes Swirl, may continually expose the less optically mature, brighter regolith below. Upon subsequent negative charging, dust might be repelled from re-entering the area under the Descartes LMA (the polarization of which remains unchanged).

Regardless, improved understanding, leading perhaps to mitigation, of lunar dust is the highest priority ahead of extended human activity on the Moon.

Slow approach. At the end of our scenario are artifacts of Apollo 16. The examination of Surveyor 3 artifacts returned by Conrad and Bean showed the greater part of weathering from dust was set in motion by the arrival of the Apollo 12 LM descent stage. This is the reason future lunar archeology should begin with an approach from a distance and on the ground.

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