LUNAR EXPLORATION ANALYSIS GROUP (LEAG)
Presentation to Planetary Science Subcommittee

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5 April 2013
Topics

- Executive Committee Membership
- LEAG Fall Meetings
- Strategic Knowledge Gaps
- Workshops
Executive Committee

• Chip Shearer (UNM) – Chair
• Jeff Plescia (JHU/APL) – Vice Chair
• Clive Neal (UND) – Past Chair
• Noah Petro (NASA) - Secretary
• Dallas Beinhoff (Boeing) – Commercial Space
• Kurt Sacksteder (NASA) – ISRU
• Steve Mackwell (LPI) – Community
• Greg Schmidt (NASA) – NLSI
• Mike Wargo (HEOMD) – Executive Secretary
• George Tahu (SMD)
LEAG 2012

Annual Meeting of the Lunar Exploration Analysis Group

October 22–24, 2012  Greenbelt, Maryland

• Sessions:
  – Lunar Missions: From the Apollo Program to Artemis and Beyond
  – Exploring the Solar System: Updates from NASA
  – Exploration of the Moon – Posters
  – Lunar Missions: The Next Generation
  – The Cold-Hearted Orb that Rules the Nigh
  – Human Exploration of the Moon and Gaps in Our Strategic Knowledge

• 120± attendees
• ~60 Abstracts
LEAG 2013

October 2013
Applied Physics Laboratory
The Johns Hopkins University
Strategic Knowledge Gaps

• GAP-SAT 1: Strategic Knowledge Gaps for the “Moon First” Human Exploration Scenario

• LEAG GAP-SAT 2

• Theme 1 Understand the lunar resource potential
  – Samuel Lawrence (ASU)

• Theme 2 Understand the lunar environment and its effects on human life.
  – William Farrell (NASA GSFC)

• Theme 3 Understand how to work and live on the lunar surface.
  – Jeff Plescia (JHU-APL)

• Forwarded to Mike Wargo (HEOMD)
# Strategic Knowledge Gaps

<table>
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<tr>
<th>SKG Themes</th>
<th>SKG Categories</th>
<th>Examples of SKGs</th>
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| **I. Understand the lunar resource potential.** | A. Solar Resources  
B. Regolith Resources 1  
C. Regolith Resources 2  
D. Polar Resources  
E. Pyroclastic Deposit Resources  
F. Lunar ISRU production efficiency 1  
G. Lunar ISRU production efficiency 2 | I-A Solar illumination mapping  
I-B Regolith volatiles, Apollo samples  
I-C Regolith volatiles, in situ  
I-D Extent, magnitude and age of cold traps  
I-E Pyroclastic deposit volatiles, in situ  
I-F ISRU production efficiency, Earth testing  
I-G ISRU production efficiency, Moon testing |
| **II. Understand the lunar environment and its effects on human life.** | A. Solar Activity  
B. Radiation at the lunar surface  
C. Biological impact of dust  
D. Maintaining peak human health | II-A Solar Event Prediction  
II-B Radiation shielding effect of lunar materials  
II-C Biological effects of lunar dust. Earth-based testing  
II-D Maintain peak human health and performance in dusty, high-radiation, partial gravity environments |
| **III. Understand how to work and live on the lunar surface.** | A. Resource production  
B. Geodetic grid & navigation  
C. Surface trafficability  
D. Dust and Blast Ejecta  
E. Plasma environment and charging  
F. Energy production and storage  
G. Radiation shielding  
H. Micrometeorite shielding  
I. Lunar mass contribution and distribution  
J. Habitat, life support and mobility | III-A Excavation of lunar resources  
III-B Lunar Geodetic Control  
III-C Trafficability: Modeling  
III-D Lunar Dust Remediation  
III-E Plasma Environment and charging  
III-F Propellant scavenging  
III-G Radiation shielding technology  
III-H Micrometeorite shielding technology  
III-I Lunar mass contribution  
III-J Semi-closed life support |
Drilling Advisory Group

- LEAG, SBAG CAPTEM
- Request from Michael New (NASA HQ) on input on design of a planetary drilling workshop.
- Chaired by Dan Britt
- Developed a list of planetary drilling applications for a number of planetary environments and science-exploration goals.
LEAG, CAPTEM, LPI, and NLSI sponsors
~50 abstracts
  The Big Picture
  Optical Remote Sensing
  Lunar Meteorites: Rocks and Regolith
  Remote Sensing and Individual Rocks
  Stillwater to the Moon

http://www.lpi.usra.edu/meetings/lunarhighlands2012/
Upcoming Events

• Workshop on small (i.e., Discovery-class) lunar missions
• Workshop on human lunar mission scientific planning
• Update Lunar Roadmap