

# LEAG Update



**Dr. Samuel Lawrence**  
**Chair, Lunar Exploration Analysis Group**

Planetary Science Advisory Council Meeting  
December 2019



# LEAG Activities

- New! LEAG/SSERVI Virtual Symposium on future missions and instrument concepts Feb. 7, 2020!
- New! 2018 Findings Posted on LEAG Website
  - <https://www.lpi.usra.edu/leag/meetings/2018-findings-annual-meeting.pdf>
- New! Survive the Night LEAG/SSERVI meeting report posted on LEAG website
- **Thank you PSD for helping with issues relating to lunar sample studies as they pertain to EW and SSW!**
- Lunar ISRU 2019
  - July 15-19, USRA HQ, Columbia, MD
  - 200+Attendees
  - Speech by NASA Dep. Admin Morhard
  - Draft meeting report in progress
- Science from the Moon - Astro2020 White Papers hosted on LEAG website
- Planetary Decadal Response
- New! Joint CAPTEM/LEAG Special Action Team on aspects of Artemis sampling and curation
- New Views of the Moon 2 chapters

# LEAG

Annual Meeting of the Lunar  
Exploration Analysis Group

October 28–30, 2019  
Washington D.C.



- 2019 LEAG at Washington Hilton, Washington, D. C.
- Day 1: Preparing for the Next Planetary Decadal Survey - in-depth breakout groups
- Day 2+3: Planning for future Human Lunar Exploration (Project Artemis, 2024 and beyond)
- Keynote Address by NASA Deputy Administrator Morhard, excellent participation from HEOMD, SMD, STMD



# 2019 Draft Meeting Findings Summary

*2024 is providing much-needed urgency and focusing of resources!*

**Finding 1.** NASA should seek to maximize the lunar sample mass to be returned by Artemis 3, to bring the current requirement of 26 kg more in line with the recommendations from the 2010 CAPTEM-LEAG “[Review of Sample Acquisition and Curation During Lunar Surface Activities](#)” analysis document (which recommended a minimum of 250 kg). If the architecture does not allow for this magnitude of returned sample mass, a greater emphasis must be placed on defining what investigations the returned samples will be prioritized for, and on providing astronauts the tools and training needed for smart sample selection to enable these investigations. Furthermore, automatic sample returns should be developed as a capability for the LDEP program.



# 2019 Draft Meeting Findings Summary

**Finding 2.** LEAG strongly supports Phase 2 of the Artemis program, specifically the sustainable surface presence and permanent surface infrastructure, and encourages NASA to maintain the urgency of Phase 1 in developing a permanent lunar surface presence that will achieve the goals of the [Lunar Exploration Roadmap](#) in terms of science, sustainability, and feed-forward to Mars and other destinations.

# 2019 Draft Meeting Findings Summary

**Finding 3.** A set of realistic goals and objectives is needed for a resource prospecting campaign and ISRU demonstration. NASA should work with the community to develop such goals and objectives. Recognizing the importance of ISRU to a sustainable program of space exploration, the LEAG community is eager to provide its assistance.

# 2019 Draft Meeting Findings Summary

**Finding 4.** While prospecting the potential polar volatile deposits is important, any long-term lunar sustainability should also encompass other well-quantified resources, including the use of lunar regolith and leveraging the regional pyroclastic deposits, whose resource potential has been well-quantified since the 1980s.

# 2019 Draft Meeting Findings Summary

**Finding 5.** LEAG urges NASA to ensure that the potential of LDEP to achieve high-priority planetary science and exploration objectives is fully realized by leveraging all lunar mission opportunities as part of a well-defined, coherent strategic vision. For example, as currently formulated, the CubeSat payloads envisioned for Artemis 2 are a missed opportunity; Artemis 2 should be leveraged by all of the mission directorates to offer competed PI-led payload opportunities that advance strategic science and exploration objectives.



# 2019 Draft Meeting Findings Summary

LEAG strongly reiterates the importance of using the decadal survey process to identify science priorities that should be addressed within the New Frontiers program.

**Finding 6.** LEAG recommends that more flexibility in implementation of the science goals of SPA-SR be permitted for New Frontiers 5. Allowing proposals for missions that address the science goals of SPA-SR using different approaches and different targets would take advantage of both recent advances in science and creative implementation solutions that may emerge from the planetary science community.


# 2019 Draft Meeting Findings Summary

**Finding 7.** The representatives of the commercial teams and the senior NASA leadership stand in sharp contrast to the more diverse lunar science community (which itself continues to strive to achieve full equality). LEAG encourages our leadership and our partners to take concrete steps in hiring and promotion to harness all of the nation's talent to achieve great goals.

# 2019 Draft Meeting Findings Summary

The National Space Council has requested that NASA develop a plan for sustainable lunar surface exploration and development, as well as feed-forward applicability to other destinations

**Finding 8.** The LEAG community has significant and unique domain expertise in establishing coherent, comprehensive, objectives for sustainable lunar exploration which provide clear value to the nation and world, and requests to be offered a pathway to incorporate the expertise of the entire domestic and international lunar exploration community represented by LEAG into the plan requested by the Space Council.



ONLY A FEW DAYS  
AWAY IS A  
STUNNING **WORLD**  
FULL OF **WONDER**  
AND **OPPORTUNITY**  
WAITING FOR **US**

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