



Lunar Surface Innovation

C O N S O R T I U M

Extreme Environments & Surface Power Focus Group December Meeting

December 7, 2021

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Today's Agenda

- LSIC Updates
- Fall Meeting Overview
- Cross Talk
 - Focus: Radiation Hardened Power Electronics
- Open floor

LSIC Updates

DOE releases RFP on Fission Surface Power

- 40 kWe (higher power desirable), 10 years in lunar environment.
- 5 rem/year at 1 km
- Mobility requirement
- Above LEU needs justification
- <https://sam.gov/opp/f2610d99cf174e959eede4b170d86e2d/view>

ESA Workshop: Space-based Solar Power for Net Zero

- **An international workshop to plan ESA's next steps towards providing clean energy from space for a greener Earth.**
- This Thursday and Friday, via Webex
- <https://indico.esa.int/event/399/>

LSIC Updates

NASA Outlines Challenges, Progress for Artemis Moon Missions

- NASA leadership discussed the challenges and progress of America's lunar exploration plans and reiterated a long-term commitment to exploring the Moon and sending astronauts to Mars.
- NASA Administrator Bill Nelson laid out the path forward for early Artemis missions that will pave the way for lunar surface missions
 - <https://www.nasa.gov/press-release/nasa-outlines-challenges-progress-for-artemis-moon-missions>

Break the Ice Lunar Challenge RFI

- Seeking additional inputs to the Break the Ice Lunar Challenge rules and questions for Phase 2 of the Challenge, proposed to start in March 2022
- The Challenge seeks to incentivize innovative approaches for excavating icy regolith and delivering acquired resources in extreme lunar environmental conditions
- The Challenge also seeks to incentivize solutions for maximizing resource delivery while minimizing energy use and the mass of equipment delivered to the lunar surface.
 - <https://sam.gov/opp/3015959e2d0742fe9fa8ccb8bf2356e9/view>
 - Responses are due by Dec 20th 11:59 PM Eastern.

LSIC Updates

2022 Breakthrough, Innovative and Game-Changing (BIG) Idea Challenge: Extreme Terrain Mobility Challenge

- <http://bigidea.nianet.org/competition-basics/>
- Proposal and Video deadline: January 18, 2022

OSBP Learning Series: NASA SBIR/STTR Program Update

- Small businesses, we want to help you navigate the federal contracting process
- <https://www.eventbrite.com/e/osbp-learning-series-nasa-sbirsttr-program-update-registration-174365240127>
- When: December 15, 2021 @ 1-2:30 EST

Please visit LSIC website for full list

<http://lsic.jhuapl.edu/Resources/Funding-Opportunities.php>

LSIC | Fall Meeting, November 3-4, 2021

The Lunar Surface Innovation Consortium (LSIC) Fall Meeting, held at Bowie State University, in Bowie, MD, provided a forum for NASA and the space technology community to discuss technology development for establishing a sustained presence on the lunar surface, focusing in particular on investments, needs, and concerns associated with autonomy and robotics.

Over 400 attendees representing more than 125 institutions joined the meeting over the course of two days. 39% of those registered for the meeting had not previously attended an LSIC meeting.

• Featured presentations

- Welcome addresses: Hon. Angela Alsobrooks, Prince George's County Executive; Dr. Aminta Breaux, Bowie State President; Dr. Pamela Melroy, Deputy Administrator NASA
- Jim Reuter, NASA Associate Administrator for Space Technology
- Bowie State University & SAIC: Partnering to Expand Opportunities at an HBCU

• Moderated panel discussions

- Technology Investors (VC): Future Space Economy
- Fostering Innovation in Industry and Academia
- Robotic Flight Demonstrations
- Robotics and Autonomy – The Big Picture

• Invited technical presentations

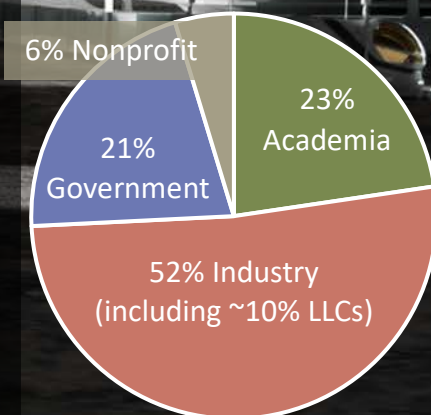
- Autonomous Operations on Earth: Trustworthy AI and Autonomy, Dr. Cara LaPointe, JHU
- NASA Autonomous Systems & Robotics: Roadmap and Investments, Dr. Terry Fong, NASA

• Key findings common among breakout sessions

- Some of the most critical technology gaps for autonomous operations on a Lunar base are free space optical communications and radiation hardened computer hardware. *Government needs to prioritize investment in communications and position, navigation, and timing (PNT) as well as ensuring standards for these are developed.*
- An understanding of the resources available and their extractability is critical, and currently lacking. *A resource prospecting campaign for water ice reduces risk and focuses the direction of technology development to build towards a sustained presence on the Moon.*



Videos of the event can be accessed at <https://lsic.jhuapl.edu/Events/Agenda/index.php?id=148>



Institutional Breakdown

Discussion Panel

- Samuel Anderson: Icmos
- Dennis Ball: Vanderbilt
- Brock J. LaMeres: RadPC
- Jean-Marie Lauenstein: GSFC
- Max Zafrani: EPC Space



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