



Lunar Surface Innovation

C O N S O R T I U M

Extreme Environments and Excavation and Construction Joint Focus Group July Meeting

July 18, 2022

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Today's Agenda

- Extreme Environments Updates
- Community Interest in Data Buys
- Excavation and Construction Updates
- Crosstalk
 - Regolith for Radiation Shielding
- Q&A

Lunar Community Meetings

- AIAA ASCEND 2022
 - Call for Content Deadline: March 31, 2022
 - Event Date: October 24-26, 2022 (hybrid)
 - <https://www.ascend.events/2022>
- Intelligent Systems Workshop
 - Event Date: July 26-27, 2022 in College Station, TX
 - https://aiaa-istc.github.io/2022_IS_Workshop.html
- International Astronautical Congress
 - Event Date: September 18 – 22, 2022 in Paris, France
 - <https://www.iafastro.org/events/iac/iac-2022/technical-programme/>

Designing for the Extremes

Virtual workshop on August 5, 2022

Start time: 9 am PT /12 pm ET

End time: 430 pm ET

Joint Workshop between Extreme Access & Extreme Environments

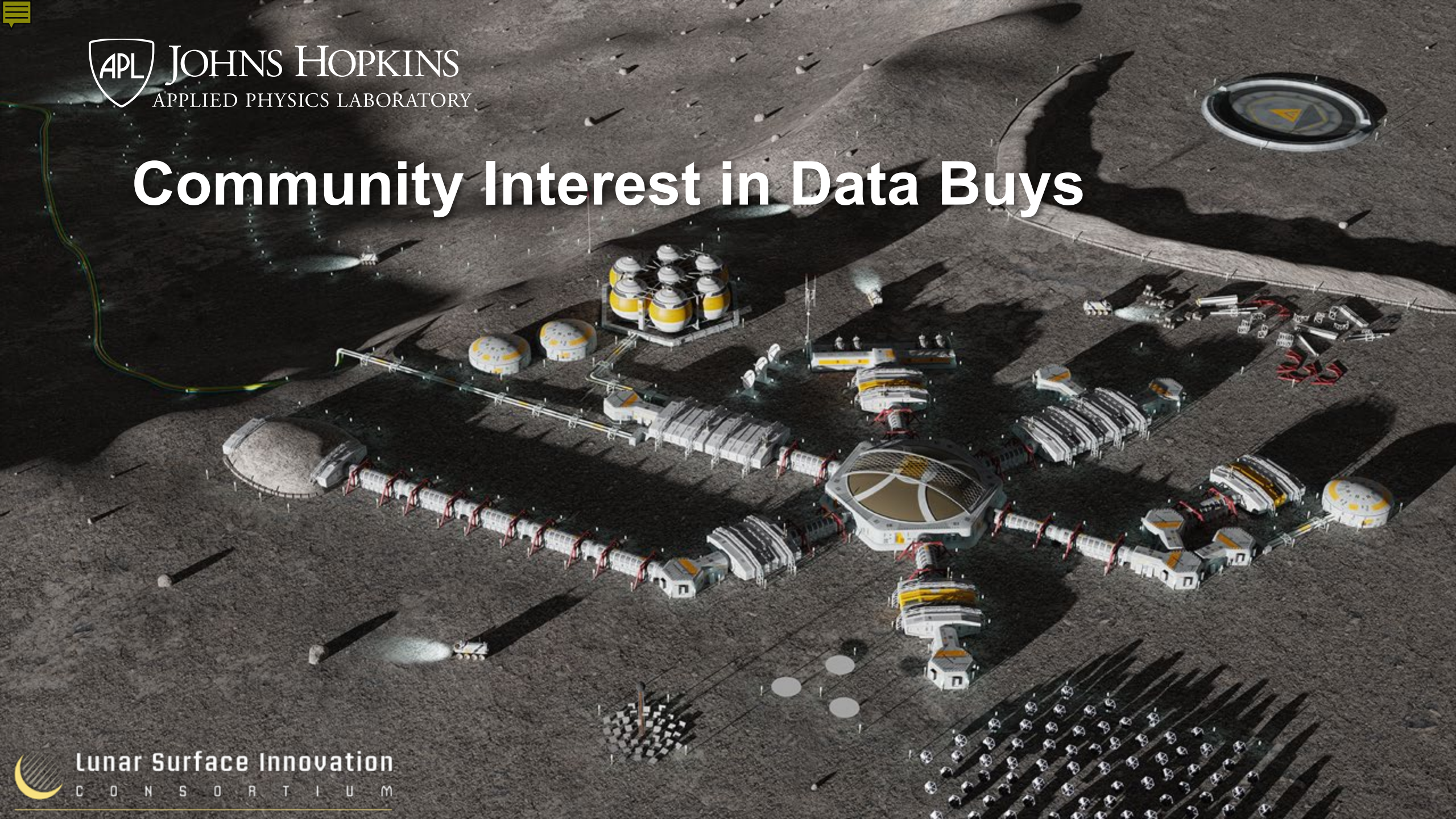
This interactive workshop will consist of an overview of the Robotics Lunar Surface Operations 2 (RLSO2) study, an Environmental Effects panel with Q&A, a panel with Q&A on technology needed to access these sites, and breakout sessions.

The goals of the workshop are to:

- Discuss specific access challenges and how environmental effects affect the design of hardware needed to implement an architecture as defined in the RLSO2 study
- Identify data needed to set design requirements and determine whether that data has already been collected, or what additional data is needed.
- Discuss ways to test to these requirements

The workshop will consist of a plenary speaker and panel discussions in a webinar format (with interactive Q&A during the panels), followed by smaller-ground discussions in breakout rooms with interactive brainstorming and note taking using miro (or similar software).

Community Interest in Data Buys



LSII | Data Buys

- NASA is interested to learn more about the interest in the LSIC community of NASA conducting data buys from commercial providers
- There are two types of data to consider
 - Data acquired as a by product of landing on the Moon
 - Dedicated data that require a specific instrument to be flown
- What kind of data access is required?
 - Does NASA buy an entire data set and put it in PDS?
 - Do users buy data directly from the providers?

LSII | By-Product Data

- Data acquired as a by product of landing on the Moon
 - Environmental Data
 - Radiation, thermal, illumination, dust, volatiles
 - Descent & Landing Imagery
 - Images of terrain during descent, surface panorama after landing
 - Landing & Post-landing effects
 - Plume/surface interactions
 - Technology/System Performance
 - Navigation performance, comm performance, landing precision, hazard detection and avoidance
- Are there additional data sets you would want?
- Are there data sets the lander will naturally acquire, but perhaps you need a variation of those data, e.g. a certain data set to be acquired at a higher cadence?

LSII | New Data Sets

- What data would enhance your ability to plan lunar surface operations?
- Data sets that require a dedicated instrument to be flown
 - E.g. New topography, or mineral map data sets
 - Could be either an orbital or surface data set
- Monitoring Data for Situational Awareness
 - Rover locations and movement
 - Charging operations
 - Search and Rescue for lost rovers
 - Comm quality/performance

LSII | General thoughts/questions

- Are there any Data privacy, Intellectual Property or Distribution Concerns
- Are these data global or regional in nature?
- Is there a different financial value for different data qualities, e.g. spatial or spectral resolution?
- What does this data set enable?
- How do you put a value on a data set (financial or otherwise)?
- What is the value of this data set to your LSIC/STMD/ESDMD, etc. mission?
- If you are a potential provider, what level of funding, if successful, is required for you to consider acquiring these data?
- Is the data you want a one-time acquisition? Every landing?
- Do you need it only for a particular region



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LSIC Excavation and Construction Joint Monthly Meeting

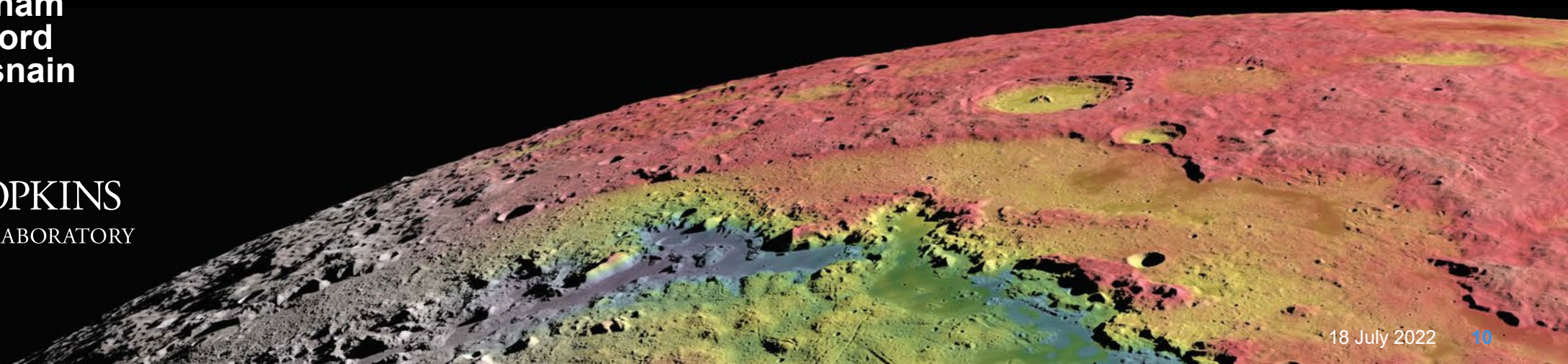
<http://lsic.jhuapl.edu/>

July 18, 2022

**Athonu Chatterjee
Claudia Knez
Jibu Abraham
Michael Nord
Sarah Hasnain**



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Break the Ice Challenge, Phase 2

<https://breaktheicechallenge.com/>

\$3 MILLION IN TOTAL PHASE 2 PRIZES!

**REGISTER FOR PHASE 2 BY SEPTEMBER
30, 2022**

[Register Today](#)

The specific NASA technology gaps that Phase 2 aims to address include:

- Excavate large quantities of icy regolith
- Delivery of large quantities of acquired resources
- Hardware and equipment that is lightweight and energy efficient
- Hardware and equipment that is reliable and durable

Submit abstracts in the “Space Resources: Mining and Processing” session

- Abstract due by August 1, 2022.
- The topics may include but not limited to:
 - Technical and legal challenges and solutions related to mining and processing of space resources
 - Moon mining
 - Cutting-edge technologies and research
 - Any other topics related to space resources

www.smeannualconference.com

Today's Talks

- Dan Britt (University of Central Florida) - "The Lunar Regolith and Shielding"
- Tony Slaba (NASA Langley) - "Radiation Shielding for Lunar Missions: Regolith Considerations"
- John Watts (NASA Marshall) - "Radiation Analysis of Candidate Structures for Moon-to-Mars Planetary Autonomous Technology (MMPACT)"
- Melanie Grande (NASA Langley) - "Protecting Crew and Surface Systems with a Long-Duration Lunar Safe Haven"



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