Lunar Surface Innovation
CONSORTIUM

LSIC Excavation and Construction Focus Group

http://lsic.jhuapl.edu/

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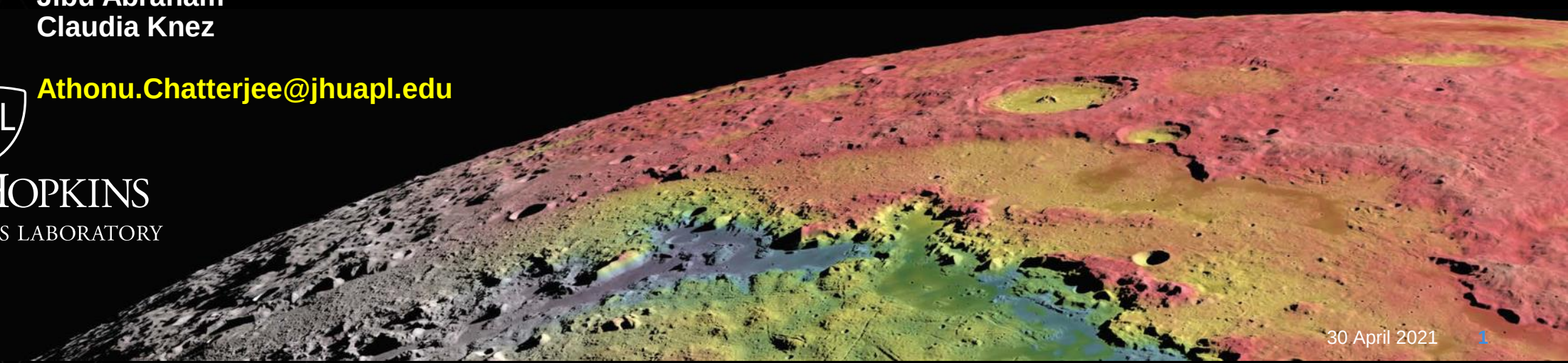

Friendly Reminders

- Slides, chat and recording will be posted in our website in 2-3 days. (http://lsic.jhuapl.edu/Focus-Areas/Excavation-and-Construction.php)

- Feel free to post your questions/suggestions in ‘chat’.
  - We can move the discussion to Confluence.

- Mute yourself if you are not speaking.

Contact me if you want to present in this meeting.

Agenda

- Focus group update.

- Two ~20-minute presentations:
  - Dr. Bob Moses and Melanie Grande (NASA Langley Research Center): **Lunar Safe Haven Study**
  - Dr. Corky Clinton (NASA Marshall Space Flight Center): **Moon to Mars Planetary Autonomous Construction Technologies (MMPACT) project overview**

New LSIC E&C APL Team Member

Claudia Knez– New member of E&C focus group at JHU/APL

- Senior Professional Staff in our Space Exploration Sector.
- Expertise : space environment applications for DoD, astronomy, systems engineering.

Welcome!

Upcoming Conference

- 11th joint meeting of the Planetary & Terrestrial Mining Sciences Symposium (PTMSS) & the Space Resources Roundtable , June 7 – 11, 2021.
  - PTMSS seeks to promote a closer relationship between the space and mining sectors.
  - https://www.ptmss.ca

Today's Talks

(1) Dr. Bob Moses and Melanie Grande (NASA Langley Research Center): **Lunar Safe Haven Study**

(2) Dr. Corky Clinton (NASA Marshall Space Flight Center): **Moon to Mars Planetary Autonomous Construction Technologies (MMPACT) project overview**

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E&C Technical Areas Google Survey Results

Habitat construction in lunar conditions. (Inflatable habitat, underground habitat, radiation shielding, multi-functional materials/structures)	**70.5%**
Manufacturing processes for lunar construction. (Additive manufacturing, sintering, regolith fiber pulling)	63.6%
Excavation technology for hard regolith/icy material. (Drilling, mining, lightweight construction equipment)	61.4%
Autonomous vehicles and robots for E&C on lunar surface.	59.1%
Lunar surface structure development. (Landing pads, berms, roads)	54.5%
Increased autonomy of operations.	34.1%
Virtual lunar terrain simulation.	29.5%
Beyond additive technology.	22.7%
Long duration robust , easily maintainable robot design for industrial scale use (not science)	2.3%
Subsurface and interior imaging and composition analysis	2.3%
Compressed, sifted regolith as a building material	2.3%
Spacecraft refueling station development	2.3%

LSII System Integrator - APL

A key tenet of LSII is to implement a multitude of novel collaborations across industry, academia, and government in order to successfully develop the transformative capabilities for lunar surface exploration.

Origin of the APL Task

- NASA was investigating using a University Affiliated Research Center (UARC) to bring efficiencies to development
- LSII initiated a tasked APL, to assess system integration role for the Lunar Surface Innovation Initiative
- APL established a Lunar Surface Consortium with academia and industry representatives, as well as NASA experts, that span a broad range of capabilities to execute timely studies, tasks, and/or acquisitions

The Consortium will assist NASA in

- Identifying lunar surface technology needs and assessing the readiness of relative systems and components
- Making recommendations for a cohesive, executable strategy for development and deployment of the technologies required for successful lunar surface exploration
- Providing a central resource for gathering information, analytical integration of lunar surface technology demonstration interfaces, and sharing of results