



Lunar Surface Innovation

C O N S O R T I U M

LSIC Dust Mitigation Focus Group

Monthly Meeting

October 20, 2022



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APPLIED PHYSICS LABORATORY

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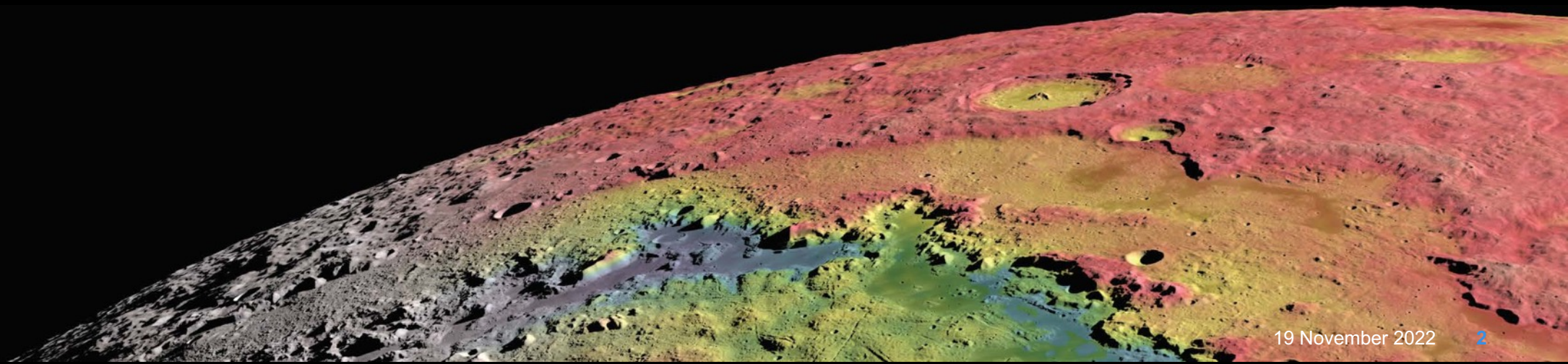
Facilitator: DustMitigation@jhuapl.edu

APL LSIC Dust
Mitigation Team:

Lindsey Tolis
Mark Perry
Richard Miller
Sarah Hasnain

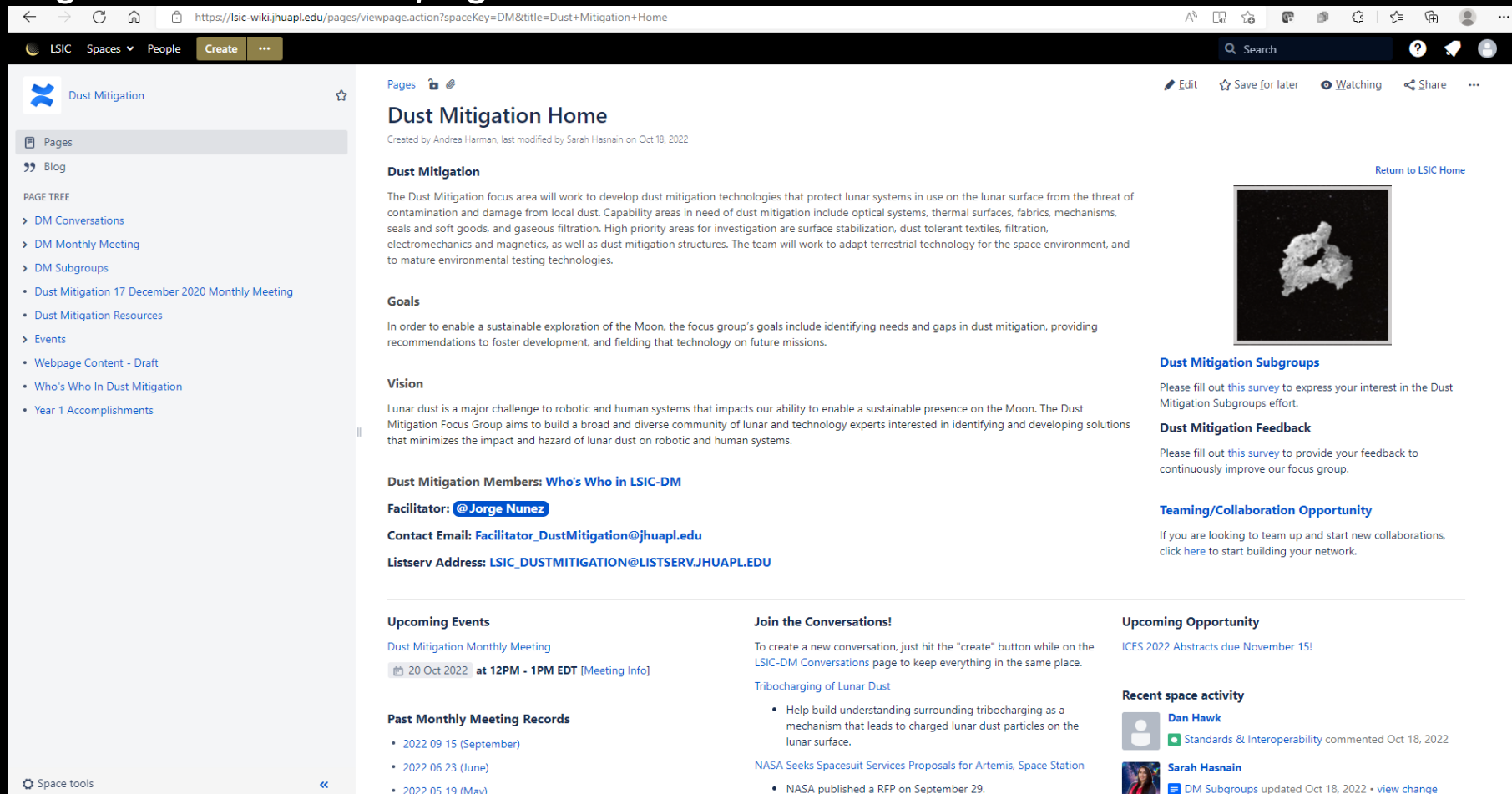
Agenda

- Welcome, LSIC and Focus Group Updates
- Upcoming Opportunities and Meetings
- NASA PRISM 3 Solicitation
- LSIC Fall Meeting
- Subgroup Networking
- Wrap-Up



LSIC Dust Mitigation Confluence Site

- Please contact Andrea Harman (ams573@alumni.psu.edu) to get set up with an account!
- *Dust Mitigation Discussion page and wiki*



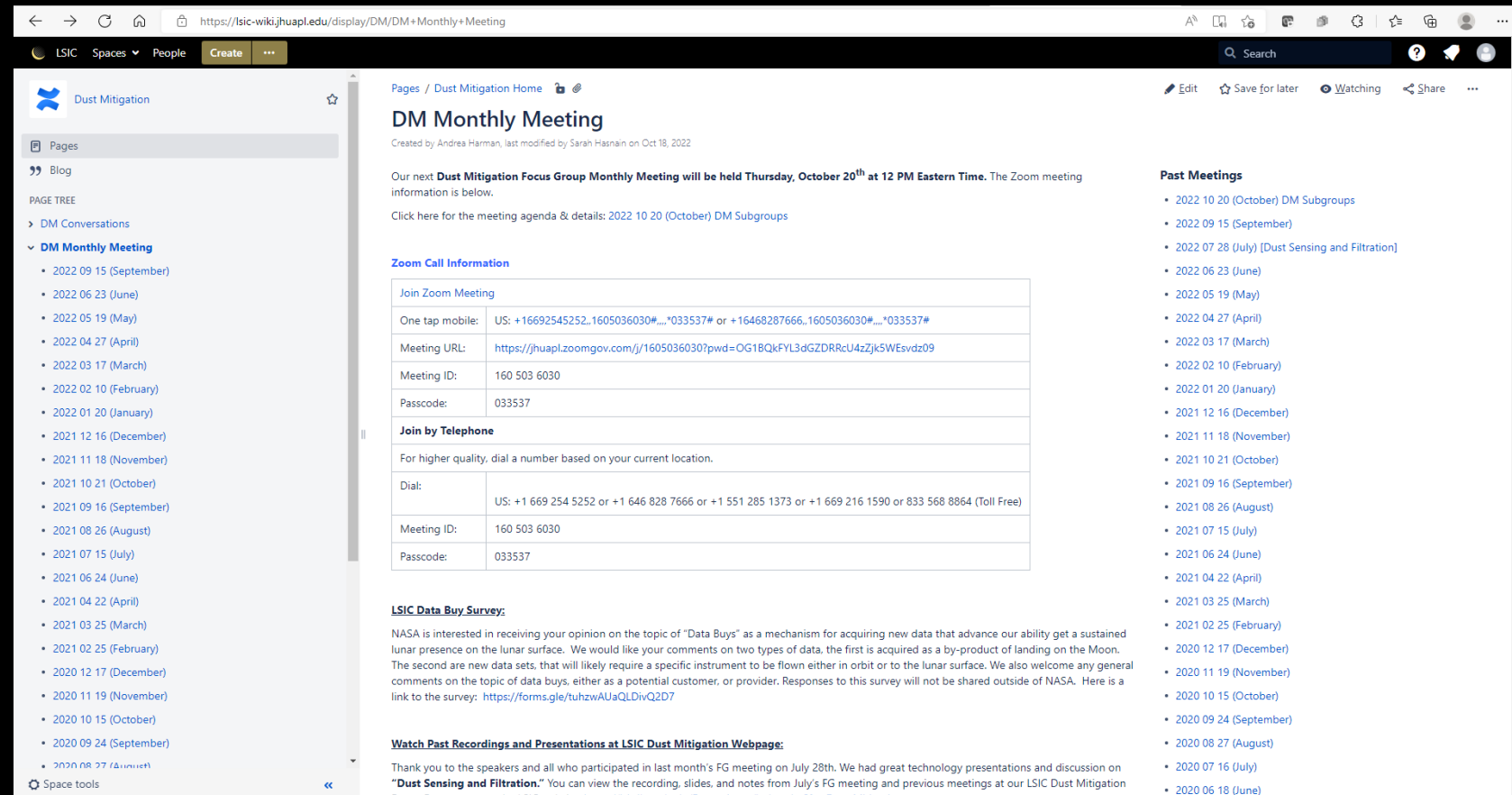
The screenshot shows the Confluence page for the Dust Mitigation Home. The page is titled "Dust Mitigation Home" and was created by Andrea Harman, last modified by Sarah Hasnain on Oct 18, 2022. The page content includes:

- Dust Mitigation:** The Dust Mitigation focus area will work to develop dust mitigation technologies that protect lunar systems in use on the lunar surface from the threat of contamination and damage from local dust. Capability areas in need of dust mitigation include optical systems, thermal surfaces, fabrics, mechanisms, seals and soft goods, and gaseous filtration. High priority areas for investigation are surface stabilization, dust tolerant textiles, filtration, electromechanics and magnetics, as well as dust mitigation structures. The team will work to adapt terrestrial technology for the space environment, and to mature environmental testing technologies.
- Goals:** In order to enable a sustainable exploration of the Moon, the focus group's goals include identifying needs and gaps in dust mitigation, providing recommendations to foster development, and fielding that technology on future missions.
- Vision:** Lunar dust is a major challenge to robotic and human systems that impacts our ability to enable a sustainable presence on the Moon. The Dust Mitigation Focus Group aims to build a broad and diverse community of lunar and technology experts interested in identifying and developing solutions that minimizes the impact and hazard of lunar dust on robotic and human systems.
- Dust Mitigation Members: Who's Who in LSIC-DM**
 - Facilitator:** @Jorge Nunez
 - Contact Email:** Facilitator_DustMitigation@jhuapl.edu
 - Listserv Address:** LSIC_DUSTMITIGATION@LISTSERV.JHUAPL.EDU
- Upcoming Events:** Dust Mitigation Monthly Meeting on 20 Oct 2022 at 12PM - 1PM EDT [Meeting Info]
- Past Monthly Meeting Records:**
 - 2022 09 15 (September)
 - 2022 06 23 (June)
 - 2022 05 19 (May)
- Join the Conversations!** To create a new conversation, just hit the "create" button while on the LSIC-DM Conversations page to keep everything in the same place.
 - Tribocharging of Lunar Dust:**
 - Help build understanding surrounding tribocharging as a mechanism that leads to charged lunar dust particles on the lunar surface.
 - NASA Seeks Spacesuit Services Proposals for Artemis, Space Station:**
 - NASA published a RFP on September 29.
- Upcoming Opportunity:** ICES 2022 Abstracts due November 15!
- Recent space activity:**
 - Dan Hawk:** Standards & Interoperability commented Oct 18, 2022
 - Sarah Hasnain:** DM Subgroups updated Oct 18, 2022 - view change

Join the Discussion on Confluence Site

- Please contact Andrea Harman (ams573@alumni.psu.edu) to get set up with an account!
- *Dust Mitigation Discussion page and wiki*

- 1. Sign-in to add a comment
- 2. Add comment at bottom of page
- 3. You can comment before, during, or after today's meeting



The screenshot shows a Confluence page titled "Dust Mitigation" with a sub-page "DM Monthly Meeting". The page content includes:

- DM Monthly Meeting**: Created by Andrea Harman, last modified by Sarah Hasnain on Oct 18, 2022.
- Text: "Our next **Dust Mitigation Focus Group Monthly Meeting** will be held **Thursday, October 20th** at **12 PM Eastern Time**. The Zoom meeting information is below."
 - Click here for the meeting agenda & details: [2022 10 20 \(October\) DM Subgroups](#)
- Zoom Call Information**:

Join Zoom Meeting	
One tap mobile:	US: +16692545252, 1605036030#...*033537# or +16468287666, 1605036030#...*033537#
Meeting URL:	https://jhuapl.zoomgov.com/j/1605036030?pwd=OG1BQkFYL3dGZDRRcU4zZjk5WEsvdz09
Meeting ID:	160 503 6030
Passcode:	033537
- Join by Telephone**:

For higher quality, dial a number based on your current location.

Dial:	US: +1 669 254 5252 or +1 646 828 7666 or +1 551 285 1373 or +1 669 216 1590 or 833 568 8864 (Toll Free)
Meeting ID:	160 503 6030
Passcode:	033537
- LSIC Data Buy Survey**:

NASA is interested in receiving your opinion on the topic of "Data Buys" as a mechanism for acquiring new data that advance our ability get a sustained lunar presence on the lunar surface. We would like your comments on two types of data, the first is acquired as a by-product of landing on the Moon. The second are new data sets, that will likely require a specific instrument to be flown either in orbit or to the lunar surface. We also welcome any general comments on the topic of data buys, either as a potential customer, or provider. Responses to this survey will not be shared outside of NASA. Here is a link to the survey: <https://forms.gle/tuhzwAUaQLDivQZD7>
- Watch Past Recordings and Presentations at LSIC Dust Mitigation Webpage**:

Thank you to the speakers and all who participated in last month's FG meeting on July 28th. We had great technology presentations and discussion on "**Dust Sensing and Filtration**." You can view the recording, slides, and notes from July's FG meeting and previous meetings at our LSIC Dust Mitigation
- Past Meetings**:
 - 2022 10 20 (October) DM Subgroups
 - 2022 09 15 (September)
 - 2022 07 28 (July) [Dust Sensing and Filtration]
 - 2022 06 23 (June)
 - 2022 05 19 (May)
 - 2022 04 27 (April)
 - 2022 03 17 (March)
 - 2022 02 10 (February)
 - 2022 01 20 (January)
 - 2021 12 16 (December)
 - 2021 11 18 (November)
 - 2021 10 21 (October)
 - 2021 09 16 (September)
 - 2021 08 26 (August)
 - 2021 07 15 (July)
 - 2021 06 24 (June)
 - 2021 04 22 (April)
 - 2021 03 25 (March)
 - 2021 02 25 (February)
 - 2020 12 17 (December)
 - 2020 11 19 (November)
 - 2020 10 15 (October)
 - 2020 09 24 (September)
 - 2020 08 27 (August)
 - 2020 07 16 (July)
 - 2020 06 18 (June)

Updates and Communications

- Monthly LSIC newsletter – New edition came out early October 2022
 - <http://lsic.jhuapl.edu/Resources/>
- Mailing list
 - The listserv goes to all participants. Use with caution. But feel free to use!
 - Please make sure to add LSIC_DUSTMITIGATION@LISTSERV.JHUAPL.EDU to safe senders list.
 - If we need smaller, focused lists we can set those up
- Updates to the webpage - <http://lsic.jhuapl.edu/Focus-Areas/Dust-Mitigation.php>
 - Notes, slides, recordings from telecons posted here
- Wiki is ready!
 - Confluence is free to you and available to all registered LSIC members
 - To request an account, please email Andrea Harman: ams573@alumni.psu.edu
- Lightning Talks at monthly focus group meetings
 - Anyone can volunteer to give a featured talk (~15 mins)
 - Email me if you want to sign up: Facilitator_DustMitigation@jhuapl.edu

Follow the Code of Conduct for all Focus Group communications

http://lsic.jhuapl.edu/Resources/files/Code%20of%20Conduct_05222020.pdf

Space Technology Funding Opportunities

Current Tech Development Opportunities

- [Space Technology Research Institutes \(STRI\) Solicitation »](#)
 - Preliminary Proposals Due: 03 August 2022 - Invited Full Proposals Due 03 November 2022
- [Announcement for Partnership Proposals \(AFPP\) to Advance Tipping Point Technologies »](#)
 - Final Proposals Due 11/22/2022
- [NASA Space Technology Graduate Research Opportunities – Fall 2023 \(NSTGRO23\) »](#)
 - Proposals Due 11/2/2022

Future Solicitation and Opportunities

- [NASA Innovation Corps Pilot »](#)
 - Proposals may be submitted at any time through March 29, 2023, but applications will be reviewed in intervals on the following dates: July 22, 2022; Sept. 16, 2022; Nov. 17, 2022; and Jan 20, 2023

NASA PRISM 3 Solicitation

- This third Payloads and Research Investigations on the Surface of the Moon (PRISM) program element solicits proposals for an investigation that includes development and flight of science-driven suites of instruments that will be delivered to the lunar surface by the Commercial Lunar Payload Services (CLPS).
- This PRISM call is for science investigations that will be delivered to the lunar surface in mid-Calendar Year 2027.
- This delivery will go to a safe landing site identified and justified by the proposer that resides within $\pm 75^\circ$ of the lunar equator.
- Both nearside and far side destinations are open to consideration.
- This PRISM call provides the opportunity to leverage survive-the-night services and mobility services provided by the CLPS provider.
- **Step 1 due: October 24; Step 2 due: December 20;**
- Questions and comments concerning PRISM may be directed to Debra Needham and Ryan Watkins at HQ-PRISM@mail.nasa.gov.

LSIC Activities

Recent and Upcoming LSIC Meetings and Workshops (<https://lsic.jhuapl.edu/Events/>)

- LSIC Dust Mitigation Focus Group Meeting (10/20)
 - Topic: Dust Mitigation Subgroup Networking
- LSIC Fall Meeting (11/02 – 11/03)
 - University of Texas – El Paso
 - Agenda and registration posted on LSIC website
 - <https://lsic.jhuapl.edu/Events/Agenda/index.php?id=350>

Other Recent and Upcoming Dust Mitigation Related Workshop and Meetings

- AIAA ASCEND Conference (10/24-26)
 - <https://www.ascend.events/>
- Commercial Lunar Payload Services Survive the Night Technology Workshop (12/06-08)
 - Cleveland, OH/Virtual; Abstracts Due 09/22
 - <https://www.hou.usra.edu/meetings/clps2022/>

LSIC Fall Meeting

- Dates: November 2-3, 2022
- Venue: Virtual and In-Person, University of Texas at El Paso (UTEP),
- The LSIC 2022 Fall Meeting will concentrate on understanding NASA's plans and technology investments relevant to building a sustained presence on the lunar surface. The event will feature interrelationships between the six focus areas identified by the Consortium, with a specific focus on how they relate to excavation and construction.
- The fall meeting will feature individual invited talks, group and panel discussions, as well as poster sessions, breakout groups, and networking opportunities.

Call for Abstracts

- We invite abstracts from the community describing technical capabilities within the six LSIC focus areas, as well as those that identify lunar surface technology needs and assess the readiness of relative systems
- Other topics of interest include defining the parameters and constraints of the architecture required to support a sustained presence on the lunar surface, as well as economic and policy considerations.
- **All abstracts are due by 11:59PM ET on September 16th**
- **Registration NOW OPEN!**
- **Fall Meeting Website:** <https://lsic.jhuapl.edu/Events/Agenda/index.php?id=200>

Get Involved with Dust Mitigation

- **Sign-up to Receive LSIC and Dust Mitigation FG Updates:**
 - Fill out the LSIC Survey and indicate interest in Dust Mitigation to receive news and event invitations:
 - <https://lsic.jhuapl.edu/News/Sign-Up.php>
- **Help us improve the Dust Mitigation Focus Group!**
 - Feedback survey:
https://docs.google.com/forms/d/e/1FAIpQLSdjuTIK_TLMnCM4_aSMLAzLS762qztbgmcOd2fgizlCsab6KQ/viewform
- **Join one of the Dust Mitigation Subgroups!**
 - Dust Mitigation Subgroup Membership/Leaders survey:
 - <https://docs.google.com/forms/d/e/1FAIpQLScB6iT2fgPqj2zlaP0s-rwWQDQ04TPfgVyiC5zn0AQPAT5CZA/viewform>
 - Still looking for subgroup lead for Monitoring and Filtration Subgroup!
- **Interested in Teaming/Collaborating with Others?**
 - Add yourself to our Who's Who page: <https://lsic-wiki.jhuapl.edu/display/DM/Who%27s+Who+In+Dust+Mitigation>
- **Looking for info on lunar dust or dust mitigation resources?**
 - Checkout our resources page on the Dust Mitigation Wiki page on Confluence: <https://lsic-wiki.jhuapl.edu/x/94Rf>

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?
- Survey Link:
<https://forms.gle/tuhzwAUaQLDivQ2D7>

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

LSIC | Joint MOSA & Surface Power September Telecon



Joint MOSA & Surface Power Telecon: Sept 22nd 11:00 ET

Speakers: Nicolas Carbone & David Sadey, NASA Power Systems Engineers for Gateway L2

Topic: International Space Power System Interoperability Standards (ISPSIS) Overview

Abstract:

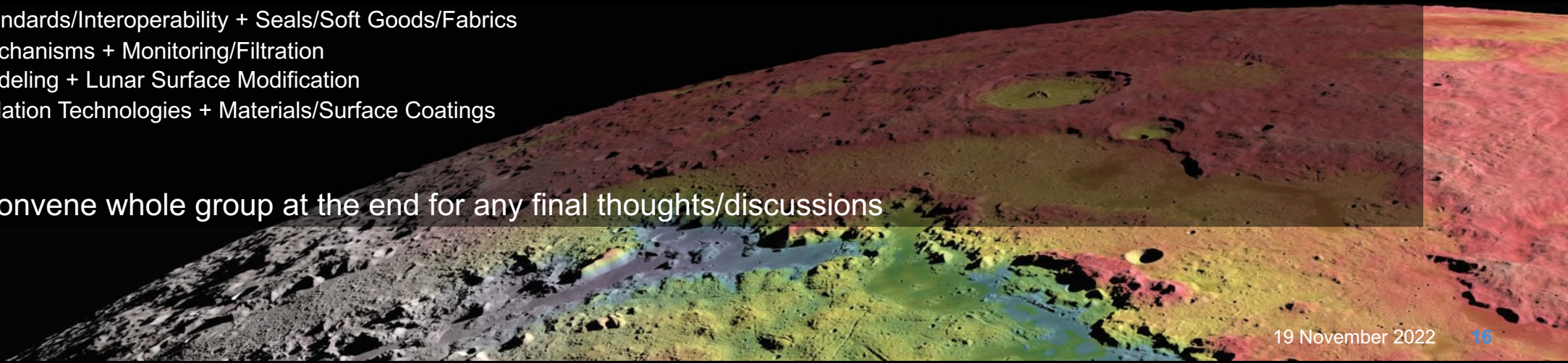
- The International Deep Space Interoperability Standards are a collection of collaboratively prepared regulations geared towards the earliest phases of spacecraft design and exploration planning. Signees include NASA, ESA, CSA, JAXA and Roscosmos.
- The presentation will provide an overview of the ISPSIS agreement. These electrical power quality standards exist to provide “commonality, reliability, interchangeability, and interoperability” for space electrical systems.
- Following the presentation, the speakers will participate in a question-and-answer session

Zoom Link for Sept 22nd 11:00 ET:

<https://jhuapl.zoomgov.com/j/1617206812?pwd=ZWVlaW5XRURsRmxJcWd4b1ZoeFFwUT09>

Breakout Networking Groups

- Interested in teaming/collaborations? Enter your information on the teaming page on Confluence:
 - <https://lsic-wiki.jhuapl.edu/x/oIGXAO>
- People will indicate a breakout group for networking
- Groups have to introduce themselves, include:
 - Name
 - Organization
 - What are you working on or interest in Dust Mitigation?
 - What kind of teaming/collaboration are you looking for?
 - What would you like to see the subgroup accomplish?
- Here are the breakout rooms:
 - Standards/Interoperability + Seals/Soft Goods/Fabrics
 - Mechanisms + Monitoring/Filtration
 - Modeling + Lunar Surface Modification
 - Isolation Technologies + Materials/Surface Coatings
- Will reconvene whole group at the end for any final thoughts/discussions





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