



Lunar Surface Innovation

C O N S O R T I U M

Extreme Access Focus Group Telecon

December 10, 2020

Dr. Angela Stickle
Senior Research Scientist
JHU Applied Physics Laboratory

Facilitator_ExtremeAccess@jhuapl.edu



JOHNS HOPKINS
APPLIED PHYSICS LABORATORY

Today's Agenda

- Communications
- Upcoming Opportunities
- Technology Spotlight – Dr. Patrick McGarey, JPL
 - A Tethered Architecture for Long-Distance Power and Communication Transmission to Support Lunar Operations
- Open floor and Discussion

- Confluence is our record of discussions and a good repository
 - Confluence is free to you and available to all registered LSIC members
 - To request an account, please email Andrea Harman: ams573@alumni.psu.edu
- Technology Spotlights/Lightning Talks at monthly telecons
 - Anyone can volunteer to give a lightning talk (10-20 mins)
 - Email Angela to sign up!
- Monthly LSIC newsletter –edition came out last week
 - <http://lsic.jhuapl.edu/Resources/>
- Mailing list
 - The listserv goes to all participants. Use with caution. But feel free to use!
 - Follow the Code of Conduct, found on the Resources webpage
- Updates to the webpage - <http://lsic.jhuapl.edu/Focus-Areas/Extreme-Access.php>
 - Notes, slides, recordings from telecons posted here

Follow the Code of Conduct for all Focus Group communications



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Discussion of Lunar Architecture

Created by Angela Stickle, last modified by Terry Fong on Dec 09, 2020

Let's discuss ideas and feedback for lunar architecture – infrastructure that would enable and facilitate future missions.

Examples of "architecture":

- Commercial Lunar Payload Services (CLPS) – provides "routine" transportation of payloads to the lunar service.
- NASA Deep Space Network – provides data communication between spacecraft and Earth
- Mars orbiters (MRO, Mars Express, Mars Odyssey, etc) – provides comm relay between Mars surface and Earth

Infrastructure needed for the Moon (emphasis on surface/subsurface missions)

- Data communications
 - far side
 - relay (surface to Earth)
 - on-demand
 - subsurface relay
- Positioning, navigation, and timing (PNT)
- Remote monitoring – imaging for and of missions (similar to what MRO provides for Mars)
- Surface power – generation and distribution / provisioning
- High-performance distributed computing – equivalent of "cloud computing"

Where can we go on the surface that would:

1. Drive innovation?
2. Utilize technology currently being developed?
3. Answer high-priority science goals?

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Upcoming Meetings

- Focus Group Telecons (2nd Thursday each month, 3-4 pm EDT)
 - [December 10, 2020](#)
 - January 14, 2021
- Lunar Surface Science Workshop
 - Space Biology, January 20-21, 2021
 - Structuring Real-Time Science Support of Artemis Crewed Operations, February 24-25, 2021
 - Free, but **registration is required**
 - <https://www.hou.usra.edu/meetings/lunarsurface2020/>
- American Geophysical Union Annual Meeting, December 1-17 2020

- Current Funding Opportunities:
 - 2021 BIG IDEA CHALLENGE: Dust Mitigation Technologies for Lunar Applications (due 12/13)
 - <http://bigidea.nianet.org/2021-challenge/>
 - Lunar Vertical Solar Array Technology (due 12/14)
 - <https://nspires.nasaprs.com/external/solicitations/summary!init.do?sollid={68A7EFE3-1B4F-5AA1-A169-119D97C8DB8F}&path=open>
 - Watts on the Moon Centennial Challenge
 - <https://www.herox.com/WattsOnTheMoon>
 - Phase 1 Registration and Submission Deadline: 25 March 2021
 - Break the Ice Lunar Challenge
 - <https://breaktheicechallenge.com/>
 - Registration and System Architecture Submission Deadline: 18 June 2021

Discussion of Lunar Infrastructure

- Please join the discussion on the Confluence page for LSIC Extreme Access
<https://lsic-wiki.jhuapl.edu/display/EA/Discussion+of+Lunar+Architecture>
- We are looking for feedback from the group about potential future lunar architecture – infrastructure that would enable and facilitate future missions
- Where can we go on the surface that would:
 - Drive innovation?
 - Utilize technology currently being developed?
 - Answer high-priority science goals?
- What infrastructure is required? Why? Does it exist yet?
-

Technology Spotlight

Dr. Patrick McGarey (JPL)



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Contact information

LSIC Director: Rachel Klima, SES-LSIC-Director@jhuapl.edu
<http://lsic.jhuapl.edu>

Focus Group Area	Listserv address	Facilitator
In-Situ Resource Utilization	LSIC_ISRU@listserv.jhuapl.edu	Karl Hibbitts
Surface Power	LSIC_Power@listserv.jhuapl.edu	Wes Fuhrman
Extreme Environments	LSIC_ExtremeEnvironment@listserv.jhuapl.edu	Ben Greenhagen
Extreme Access	LSIC_ExtremeAccess@listserv.jhuapl.edu	Angela Stickle
Excavation and Construction	LSIC_ExcavationConstruction@listserv.jhuapl.edu	Athonu Chatterjee
Dust Mitigation	LSIC_DustMitigation@listserv.jhuapl.edu	Jorge Núñez

STMD Opportunities for Academia and Industry

STMD anticipates awarding ~\$600M to academia and industry supporting 2020 solicitations & awards

STMD Tipping Point Multiple Awards: *Jan – Mar 2020*

\$250M

Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) Phases I, II, II-E, Civilian Commercialization Readiness Pilot Program (CCRPP), Sequential: *Phase I Solicitation Jan – Apr 2020*

\$212M

Announcement of Collaborative Opportunity (ACO): *Jan – Mar 2020*

\$10M

Flight Opportunities Tech Flights: *Feb – May 2020*

\$10M

Early Career Faculty (ECF): *Feb – Apr 2020*

\$6M

Early Stage Innovations (ESI): *Apr – Jun 2020*

\$9M

NASA Innovative Advanced Concepts (NIAC) Phases I, II, III: *Phase I Solicitation Jun – Jul 2020*

\$4M

Space Technology Research Institutes (STRI): *Jun – Aug 2020*

\$30M

NASA Space Technology Graduate Research Opportunities (NSTGRO): *Sep – Nov 2020*

\$19M

SmallSat Technology Partnerships (STP): *Sep – Nov 2021*

\$3M

Centennial Challenges: *Varied release dates*

\$8M

NextSTEP Broad Agency Announcements (BAAs): *Varied release dates*

Varies

Lunar Surface Technology Research (LuSTR) Opportunities: *Coming soon!!!*

\$30M

Note: Funding awards are approximate and subject to change

Open Solicitations as of June 5, 2020

Solicitations were/will be open in the timeframe specified in italics