



# Lunar Surface Innovation

C O N S O R T I U M

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## LSIC ISRU Focus Group Monthly

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

<http://lsic-wiki.jhuapl.edu/> (“Confluence” sign-up required)

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# Agenda

- 3:00 – General updates
- 3:05 – 3:10 – Update on Regolith to Rebar joint workshop with Excavation & Construction.
- 3:10 –3:25 - Perspectives on Modular Open System Approach (MOSA). Matt Deminico, NASA GRC.
- 3:25 –3:35 - In-Space Servicing as applied to Lunar surface technology. Jill McGuire, NASA GSFC.
- 3:35 –3:50 - Open discussions on just-released Tipping Point and ACO
- 3:55 – Breakout Groups
  - Water-Ice Prospecting
  - O2 and Metals
  - Value Networking Analysis
  - Interoperability/Standards/Maintenance (MOSA)

# Tipping point

“The proposal submission process is complex and involves multiple steps to be carried out by all participants in the proposal.”

- Advancing new capabilities to a point that industry will complete and qualify them without further Government investment
- Two step process. (for an initial vetting)
- Topic 1. Cislunar/Lunar Surface Infrastructure & Capabilities
- Funded Space Act Agreement. Cost sharing: small company: 10%. Larger: 25%

A space technology is at a Tipping Point if:

- TRL)~>4 at time of submission of the Mini Proposal.
- Aground demonstration or flight demonstration will result in:
  - Mature to at least TRL 6, and
  - The Lead Entity much more able technology to market.
- The partner has a robust plan for commercialization

Schedule	
Mini Proposal Q	3/15
Mini Proposal due	3/31
Notifications	5/31
Final Proposal Q	7/14
Final Proposal due	7/28
Selections Notified	11/30
Funding	Jan 2023

# Announcement of Collaborative Opportunity ACO

Getting the government to pay itself to work for you.

- Specific Project
- Funding goes to NASA center(s) that is supporting the effort.
- Focused on use of NASA facilities.
- Short term, up to four years is allowed
- Unfunded Space Act Agreement (SAA) for the industry.

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# Upcoming Meetings

## Some upcoming IRSU related meetings you might not be aware of

- Regolith to Rebar. 23 Feb. Virtual. Registration closed.
- LSIC Spring Meeting. 3- 5 May. APL, Columbia Md. Hybrid.
- Space Resources Week. 3-5 May. Luxemburg. Virtual (i.e. Europe time).
- Space Resources Roundtable. 7-10 June. Colorado School of Mines. In-person. Abstracts 3/25.
- COSPAR. 16-24 July. Athens, Greece. IRSU session B0.2. Abstracts 2/11.
- IAC. 18-22 Sept. Paris, France. In-person. Abstracts 2/28.
  
- “Who’s Who in IRSU” at <https://lsic-wiki.jhuapl.edu/display/ISRU/Who%27s+Who+in+ISRU>
- Survey on how the IRSU FG is meeting your needs.

Link the in-situ production, the processing and the use/consumption of metals and metal-like by-products (that may result from O<sub>2</sub> production technologies).

Lay the foundation for the development of an eco-system in this nascent field of lunar ISRU metals and to strengthen public-private partnerships.

- Infrastructural needs for the use of metals.
- The ‘low hanging fruit’ for metal extraction.
- Feasibility of metal-specific manufacturing processes.
- Economic feasibility of metallic yields and any associated processing.
- Integrating the metal supply side with the construction side, identifying possible roles for NASA.
- Identify gaps and challenges in metal production and construction on lunar surface.

## Regolith-to-Rebar

### A combined LSIC-ISRU/E&C Focus Group Workshop

**Theme:** the metal-related products resulting from regolith processing or O<sub>2</sub> extraction and how they can be used in lunar construction and other applications

#### Agenda

##### Introduction

1100-1110: Athonu Chatterjee and Karl Hibbitts — Workshop Objectives

##### NASA Speakers

1110-1130: Mark McDonald, STMD Chief Architect — Vision Statement

1130-1215: NASA Panel

Mark McDonald, STMD Chief Architect

Niki Werkheiser, Director of Technology Maturation

Jerry Sanders (ISRU), Principal Technologist, ISRU Lead

Mark Hilburger (Excavation & Construction), Principal Technologist, E&C Lead

##### Supply-side: Regolith Extraction

1220-1230: Lunar Resources — Elliot Carol

1230-1240: Sierra Space — Brant White

1240-1250: Airbus — Mark Kinnersley

1250-1300: Pioneer Astronautics — Mark Berggren

1300-1310: Terraxis — Geo Licciardello

1310-1320: Helios — Jonathan Geifman

1320-1330: KilnCore — Antoine Missout

1330-1350: Mini — Panel (all supply-side speakers) — Q&A

##### Break 1350-1400

##### Demand-side: Construction Needs and Drivers

1400-1410: Bechtel — Keith Churchill

1410-1420: Skidmore, Owings & Merrill — Daniel Inocente

1420-1430: XArc/Astroport — Sam Jimenes

1430-1440: Redwire Space — Kari Abromitis

1440-1450: Relativity Space — Josh Brost

1450-1500: Keystone — Bryant Walker

1500-1520: Mini — Panel (all demand-side speakers) — Q&A

→ Break: 1520-1530

Combined Panel Discussion: 1530-1630

Wrap-Up: 1630-1645

# Topical Discussion

MOSA

Matt Deminico

NASA GRC

# Topical Discussion

In-Space Serving

Jill McGuire

NASA GSFC



# Wrap-Up and Transition to Breakout Groups

WaterIce Prospecting. Moderator: Karl Hibbitts

O2 tech. Moderator: Michael Nord

Value Chain. Moderator: Kirby Runyon

Interoperability/Modularity/Open Architecture. Moderator: Jodi Berdis



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