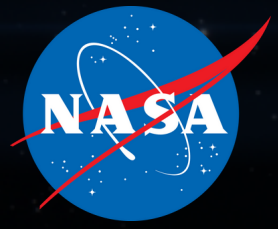


# 2023 **B**reakthrough, **I**nnovative & **G**ame-changing (BIG) Idea Challenge Forum



Engaging Universities in NASA's Mission to Develop Space  
Exploration Technologies for the Moon to Mars



## LUNAR FORGE: PRODUCING METAL PRODUCTS ON THE MOON

NOVEMBER 15-17, 2023 | CLEVELAND, OH

# WELCOME

Engaging Universities in NASA's Mission to Develop Space Exploration Technologies for the Moon to Mars



Congratulations to the 2023 BIG Idea Challenge Finalists! We are looking forward to another amazing Forum and are excited to learn more about the technologies and systems you have been working on these past several months. Your research and development as part of this year's Lunar Forge: Producing Metal Products on the Moon Challenge will prove vital as NASA looks to establish a more sustainable infrastructure on the lunar service through its Artemis program. Your participation provides a critical link for engineers, researchers, and scientists looking to further establish innovative and cost-effective ISRU capabilities and technologies that will allow humans to stay on the moon's surface for longer periods of time. By competing in this Challenge, you are now part of the NASA family, actively delivering real solutions to advance NASA's space exploration goals. We are thrilled to provide a platform for you to share your work with a wider audience here at the 2023 BIG Idea Forum. Thank you for your dedication, innovation, and BIG ideas! - *Niki Werkheiser, STMD Director of Technology Maturation*



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Technology



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## Wednesday, November 15

- 3:30 - 4:45 PM** **BIG Idea Forum Check-in**  
Hilton Cleveland Downtown, Hope Foyer, 3rd Floor  
100 Lakeside Ave. E, Cleveland, OH, 44114
- 3:45 - 4:30 PM** **Judges' Meeting**  
Cleveland Now Boardroom (3rd Floor)
- 5:00 - 5:15 PM** **Welcome: Introductions & Announcements**  
Hope Ballroom D (3rd Floor)
- 5:15 - 5:45 PM** **NASA Presentation**  
Niki Werkheiser, Director of Technology Maturation
- 5:45 - 7:45 PM** **Networking Dinner\***  
Hope Ballroom E (3rd Floor)

## Thursday, November 16

- 7:30 - 8:25 AM** **Breakfast\***  
Hope Ballroom E
- 8:30 - 9:20 AM** **Massachusetts Institute of Technology with Honeybee Robotics**  
*Artemis Steelworks: Advancing Reactor Technologies for Electrolytic Manufacturing of In-Situ Steel*
- 9:25 - 10:15 AM** **Pennsylvania State University with RFHIC & Jacobs Space Exploration Group**  
*Development of the Smelting with Microwave Energy for Lunar Technologies (SMELT) System for In-Situ Resource Processing*
- 10:15 - 10:30 AM** **Morning Break\***  
Hope Ballroom E
- 10:30 - 11:20 AM** **University of North Texas with Advanced Materials & Manufacturing Processes Institute, UNT; Enabled Engineering**  
*Solid-state Integrated Manufacturing Process for Lunar Environment (SIMPLE)*
- 11:25 AM-12:15 PM** **Missouri University of Science and Technology**  
*Lunar In-Situ Aluminum Production Through Molten Salt Electrolysis (LISAP-MSE)*
- 12:15 - 1:15 PM** **Lunch\***  
Hope Ballroom E
- 1:15 - 2:05 PM** **University of Utah with Powder Metallurgy Research Laboratory**  
*Production of Steel from Lunar Regolith through Carbonyl Iron Refining (CIR)*

## Thursday, November 16 (cont'd)

- 2:10 - 3:00 PM** **Colorado School of Mines**  
*Lunar Alloy Metal Production Plant (LAMPP)*
- 3:00 - 3:15 PM** **Afternoon Break\***  
Hope Ballroom E
- 3:15 - 4:05 PM** **Northwestern University with Wearifi, Inc.**  
*ACRE: Autonomous Casting RovEr*
- 4:10 - 5:45 PM** **Poster Session**  
Hope Ballroom D
- 5:45 - 7:00 PM** **Dinner\***  
Hope Ballroom E
- 9:00 PM** **Judges' Final Scores are Due**

## Friday, November 17

- 7:45 - 8:45 AM** **Breakfast\***  
Hope Ballroom E
- 8:00 - 11:00 AM** **Judges Deliberation**  
Cleveland Now Ballroom
- 8:45 - 9:00 AM** **Teams Board Buses for NASA Glenn**
- 9:30 - 12:30 PM** **Teams Tour NASA Glenn**
- 1:00 PM** **Teams Return to Hilton Cleveland Downtown**
- 1:30 - 3:00 PM** **Awards Luncheon\***  
Hope Ballroom E

### AGENDA LEGEND

Events streamed live to the public are **WHITE**.  
 Events restricted to Judges & Staff are **GREEN**.  
 Events restricted to Forum Participants are **ORANGE**.  
 \*Note: Meals are restricted to Paid Registrants only



**VIEW THE DIGITAL  
PROGRAM BOOK**

Team presentations will be livestreamed at: <https://livestream.com/viewnow/bigideachallenge>  
 Teams' digital technical posters will be viewable at: <https://bigidea.nianet.org/2023-forum-results>

# 2023 BIG IDEA JUDGING PANEL



**KAREN TAMINGER**  
Co-Chair, NASA Langley



**KEVIN KEMPTON**  
Co-Chair, NASA Langley



**ALEXANDER BLANCHARD**  
NASA Marshall



**DR. CHERYL BOWMAN**  
NASA Glenn



**ROBERT CARTER**  
NASA Glenn



**DR. BILL FRAZIER**  
Pilgrim Consulting



**TIMOTHY GABB**  
NASA Glenn



**MICK MAHER**  
Maher & Associates



**DR. KEVIN SLATTERY**  
The Barnes Global Advisors

The BIG Idea Challenge is sponsored by NASA through a collaboration between the Space Technology Mission Directorate's Game Changing Development (GCD) program and the Office of STEM Engagement's Space Grant Project, and is managed by a partnership between the National Institute of Aerospace and the Johns Hopkins University Applied Physics Laboratory.

<https://bigidea.nianet.org>

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