

Key Non-Polar Destinations Across the Moon to Address Decadal-level Science Objectives with Human Explorers: Panel on Human and Biological Science

Meeting No. 3

October 6-8, 2025

Hybrid Meeting

Beckman Center, Newport Room, 100 Academy Way, Irvine, CA 92617

ALL TIMES IN US PACIFIC TIME

MONDAY, OCTOBER 6, 2025

OPEN SESSION

10:15 AM	Welcome and Overview of the Meeting	Dr. Ron Turner Chair, Panel on Human and Biological Science
10:15 AM	Impact of lunar dust on human exploration (45-minute presentation and 45-minute discussion)	Dr. Phil Metzger Professor, University of Central Florida
11:45 AM	<i>Working Lunch</i>	
01:00 PM	Issues related to plant food production and bioregenerative life support systems (45-minute presentation and 45-minute discussion)	Dr. Marshall Porterfield Professor, Purdue University
02:30 PM	<i>Break into Closed Session</i>	

TUESDAY, OCTOBER 7, 2025

OPEN SESSION

09:30 AM	Overview of ECLSS for human lunar exploration (30-minute presentation and 30-minute discussion)	Dr. Ryan Kobrick Senior Program Manager Space Lab Technologies
10:30 AM	<i>Break</i>	
10:45 AM	Affects of altered gravity for human lunar explorations; issues surrounding sleep and circadian rhythms (30-minute presentation and 30-minute discussion)	Dr. Charles Czeisler Professor Harvard Medical School
12:00 PM	<i>Working Lunch</i>	
01:00 PM	<i>Break into Closed Session</i>	

IMPORTANT NOTES

Key Non-Polar Destinations Across the Moon to Address Decadal-level Science Objectives with Human Explorers: Panel on Human and Biological Science
August 25-27, 2025

Presenters:

- Please do not include unpublished data, ITAR-controlled or sensitive information in your presentation.
- A National Academies Board staff member will ask you to sign a form before the meeting allowing us permission to use your likeness and presentation for our livestream video, which will be posted on our Board website after the meeting. Please get in touch with us before the meeting if you have any concerns about this usage.

Members and Presenters:

- Remote access will be provided through Zoom. This will allow you to participate in the meeting even if you can't be physically present.
- Please note that Zoom allows audio and any materials exchanged or viewed during the session to be recorded and shared.
- By participating in this activity, you agree to let your voice, likeness, and any materials you provide be recorded for use and dissemination. This includes any language, format, or media now known or later devised.
- You release the National Academies of Sciences, Engineering, and Medicine from any and all claims, liability, or damages arising from any such use. If you disagree, please do not join the session.

Members of the General Public:

- Remote access will be provided through a live stream on Vimeo. This will also be publicly available and posted on the Board website. You do not need to register.

Thank you all for your cooperation, and we look forward to a successful meeting.

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REMOTE CONNECTION DETAILS

Zoom Web Conference & Telecon Instructions

Join from a computer:

1. Click on the URL (below). A popup will appear that says “Open URL:Zoom Launcher;” Click the “Open” button and let Zoom load (may take a minute).
2. Once loaded, Zoom will automatically display another pop-up for the audio connection. Please click the “call me” tab and enter the phone number you would like to be called at (i.e. home, office, mobile). Click “Call me” and follow the prompts.

Join from a mobile device:

1. Download the Zoom app from your phone’s app store (if you don’t have it installed already).
2. Click on the URL (below), or open the Zoom app and enter the Meeting ID: (below), and press join. Enter your name if requested.
3. The Zoom app will automatically display a pop-up window for the audio connection. Select the “Call my Phone” option from the menu, enter your phone number, press call, and follow any prompts.

Join by phone only:

1. Connection quality is much better via Zoom’s “Call me” feature from the webconference, so we strongly recommend that you connect this way.
2. If you are not able to do so, you can dial 1-877-853-5257 (Toll Free) and enter the Meeting ID: (below). International numbers are available at:

https://nasem.zoom.us/j/zoomconference?m=dm0fun9LyXrhECcUWQt2Wwdh_9TUrhXG

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Statement of Task

Panel on Human and Biological Science

The Panel on Human and Biological Science will gather information and identify and articulate the science objectives related to biology and human health and physiology in space that would be most enabled by human explorers on the moon. Using NASA's 2022 Moon to Mars Objectives, the National Academies report *Thriving in Space: Ensuring the Future of Biological and Physical Sciences Research: A Decadal Survey for 2023-2032*, and other gathered information, the panel will:

- Identify key science objectives within biology and human health and physiology in space that can or must be done by human explorers on the lunar surface;
- Specify the key measurements, either in situ or via returned samples, needed to achieve these key science objectives and why human explorers would enable those measurements (as opposed to robotic assets);
- Detail any pre-placed assets (e.g., tools, mobility devices, robotic hardware, and equipment delivered to the lunar surface prior to human landing) that would be either necessary or enabling of these key measurements; and
- Prioritize potential non-polar landing sites or characteristics of landing sites that would be most enabling of these key science objectives and measurements

This panel is one of four operating under the aegis of “Key Non-Polar Destinations Across the Moon to Address Decadal-level Science Objectives with Human Explorers” and its steering committee. The panel will provide the steering committee with its findings and a science traceability matrix outlining each potential non-polar landing site (or characteristics of landing sites) and the science objectives it would enable. The panel will not produce recommendations as part of its input to the project’s Steering Committee.