



We21
The World's Largest Conference for
Women Engineers and Technologists

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OCTOBER 21-23 2021
Indianapolis, IN
INDIANA CONVENTION CENTER

How to Return to the Moon during a Pandemic

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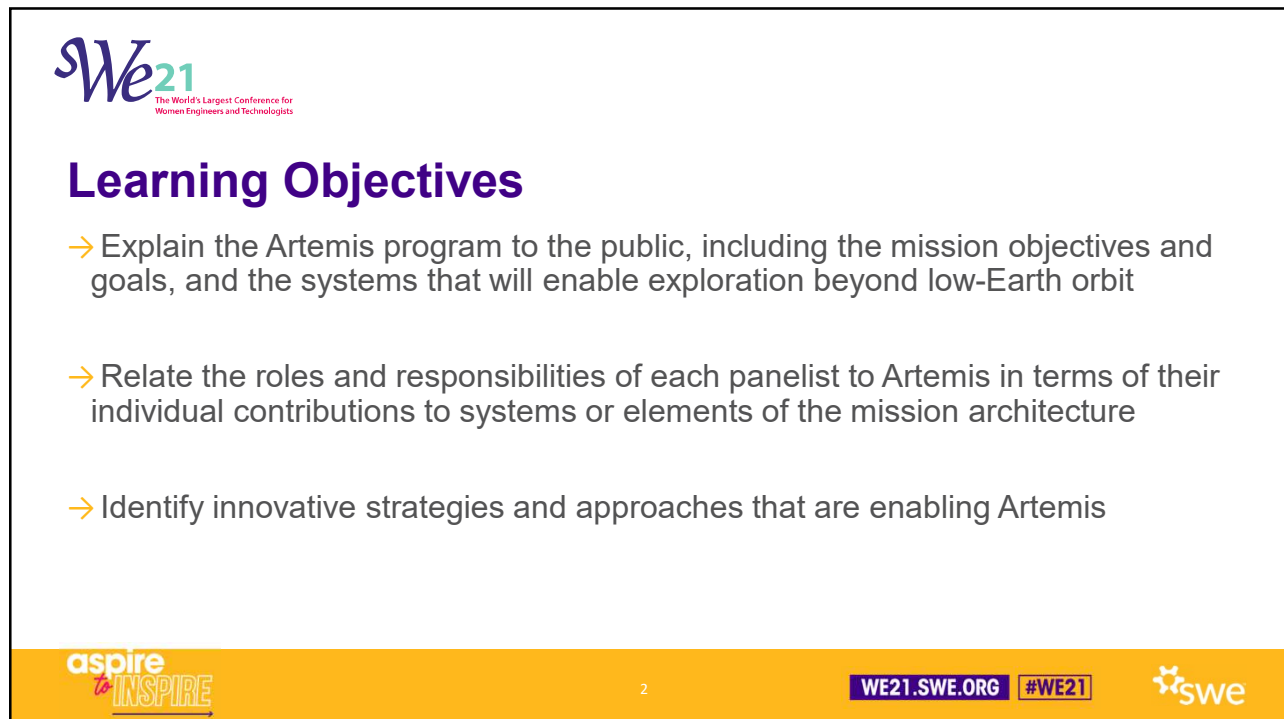
BE AMBITIOUS
DO BIG THINGS

EMBRACE CHALLENGES
ENCOURAGE OTHERS

R1 C1 R2

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Learning Objectives

- Explain the Artemis program to the public, including the mission objectives and goals, and the systems that will enable exploration beyond low-Earth orbit
- Relate the roles and responsibilities of each panelist to Artemis in terms of their individual contributions to systems or elements of the mission architecture
- Identify innovative strategies and approaches that are enabling Artemis

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ARTEMIS

Twin sister of Apollo and goddess of the Moon in Greek mythology, Artemis is the torch-bringer personifying our path to the Moon. During the next era of human exploration, we will discover life-saving, Earth-changing science and technology along the way.

Through Artemis, NASA will land the first woman and first person of color on the Moon. When the Artemis astronauts land on the lunar surface, they will step into the future, bringing all of humanity with them.

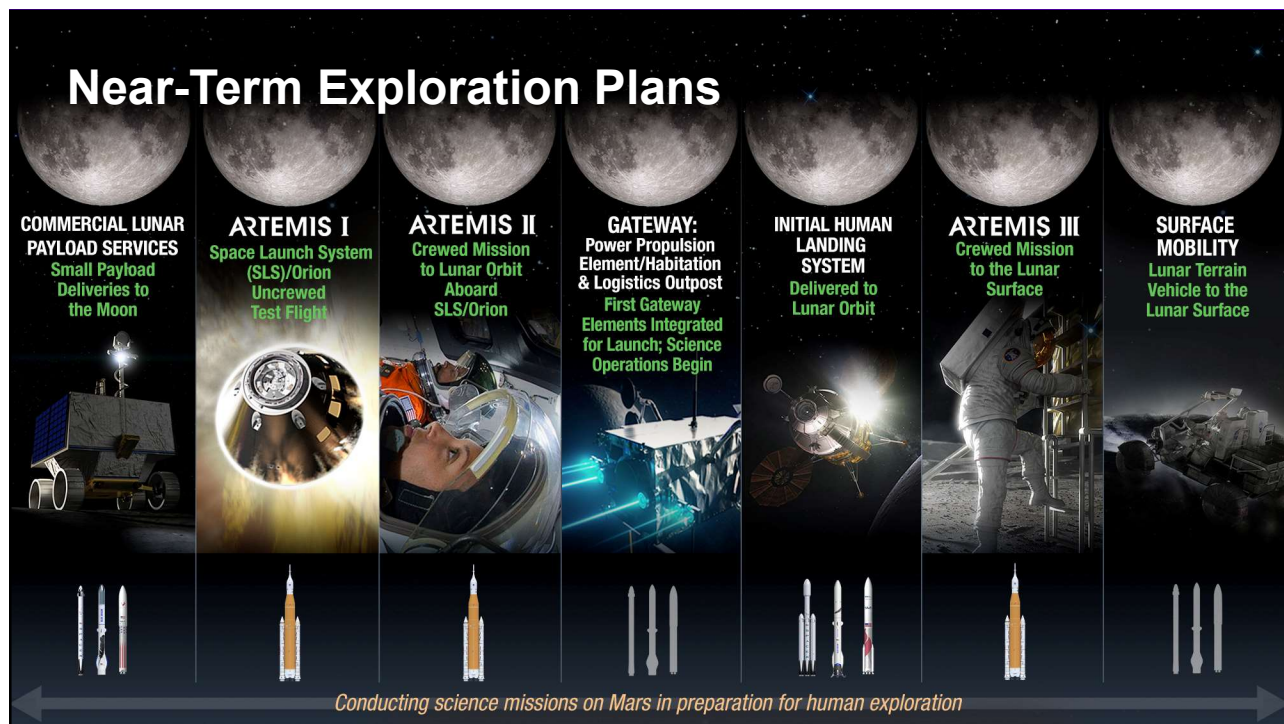
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Artemis Overview

- We're going to the Moon to learn to live on other planets and for the benefit of all humanity.
- With Artemis, NASA will put the first woman and first person of color on the lunar surface and build a sustainable presence there and in lunar orbit.



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ARTEMIS I

PREPARING FOR ARTEMIS I

The first integrated flight test of NASA's Orion spacecraft and Space Launch System rocket, launching from a modernized Kennedy Space Center.

The maiden voyage will fly without crew and is designed to push the system to its limit and return it safely to Earth to ensure safety on future crewed missions.

Building, launching, and flying the system requires a highly skilled workforce, enables growth for small businesses, revitalizes communities, and inspires our nation and world.

Targeting launch in late 2021.



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ARTEMIS II

RETURNING HUMANS TO DEEP SPACE: ARTEMIS II

With Artemis II and the first crewed flight of the SLS and Orion, up to four astronauts will return to the lunar environment for the first time in more than 50 years. This will be the Artemis Generation's "Apollo 8 moment," when the astronauts aboard Orion will capture the full globe of the Earth from afar, as a backdrop to the Moon.

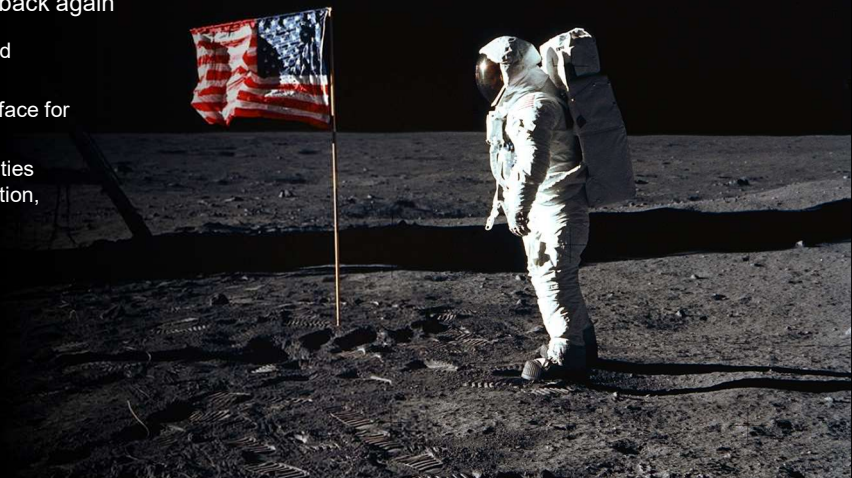
Targeting launch in 2023.

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HUMAN LANDING SYSTEM (HLS)

The first human landing systems in history to be developed by U.S. industry will take astronauts from lunar orbit to the surface and back again

- Carries crew to the lunar surface and returns them to lunar orbit
- Serves as a habitat on the lunar surface for early Artemis missions
- Houses equipment for surface activities including moonwalks, sample collection, and scientific experiments

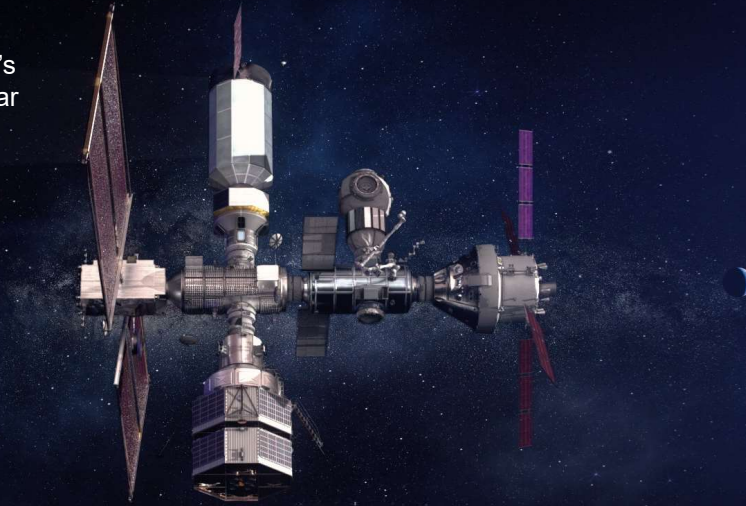


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HUMANS IN LUNAR ORBIT

The Gateway will be humanity's first outpost in a sustained lunar orbit

- Additional elements increase mission durations and science capabilities
- Evolving scientific capability includes a wide array of internal and external experiments
- Collaboration with international partners enables a truly sustainable lunar presence

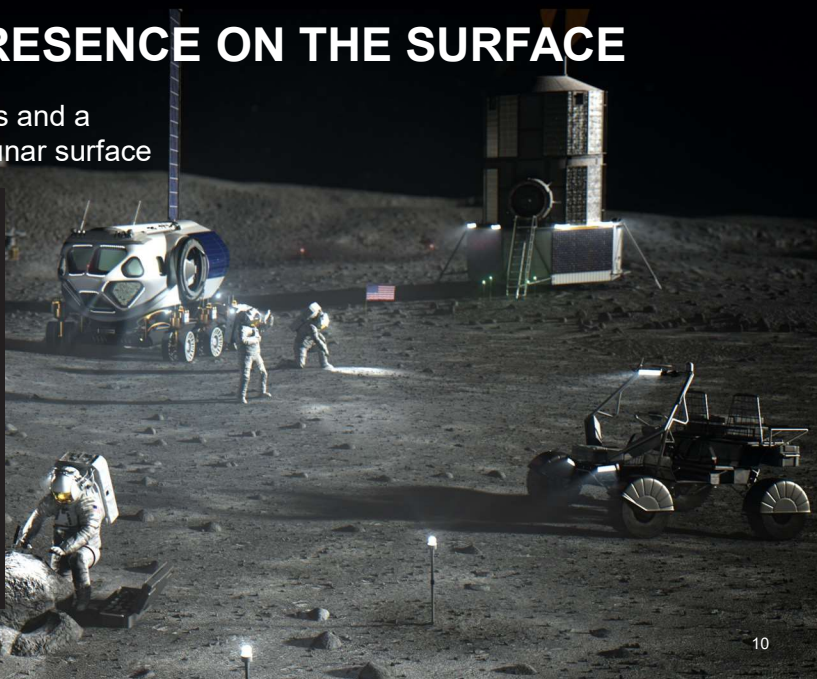


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A SUSTAINED PRESENCE ON THE SURFACE

A steady cadence of missions and a robust infrastructure on the lunar surface

- An unpressurized rover provides extended exploration range and mobility for two suited crew on the lunar surface
- A pressurized rover expands exploration range
- A foundation surface habitat enables longer duration stays
- Supported with small logistics landers
- Science, technology demonstrations, operational analogs for Mars missions



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Panel Introduction



- **Deboshri Sadhukhan**
- Deputy Project Manager for International Space Station payloads
- Safety and Mission Assurance Lead for Radioisotope Power System Project
- NASA Glenn Research Center



- **Erika Alvarez**
- Systems Engineering & Integration Manager for Advanced Exploration Systems Division
- Focus on Artemis Integration for Lunar Landing Missions
- NASA Headquarters



- **Nicole Smith**
- Deputy Director of Technology Demonstrations, Space Technology Mission Directorate
- NASA Headquarters



- **Helen Vaccaro**
- Gateway Safety and Mission Assurance Systems Engineering and Integration Lead
- NASA Johnson Space Center



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Question 1

- Please describe your current position at NASA, your role and responsibilities, and how you have been able to contribute to NASA's return to the moon as part of the Artemis Program through your current position.



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Question 2

→ Can you describe a specific challenge that you've faced associated with achieving the Artemis Program's ambitious goal to land the first female and first person of color on the moon by the mid-2020s? How did the global pandemic impact this specific challenge? How have you leveraged innovative strategies or approaches to overcome the specific challenge?



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Question 3

→ Can you talk to some of the innovative technologies that NASA will need – not only to enable humans to return to the moon under the Artemis program, but to also enable eventual human missions to Mars? How do you see the Artemis Program striking a balance of speed to return to the moon by mid-2020s with sustainability and safety?



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Question 4

→ Some of you have held positions prior to your current roles, where you have also contributed to Artemis. Can you share with us one of your previous NASA positions, highlighting how you were able to contribute to NASA's return to the moon? And how did that specific position prepare you for where you are today?



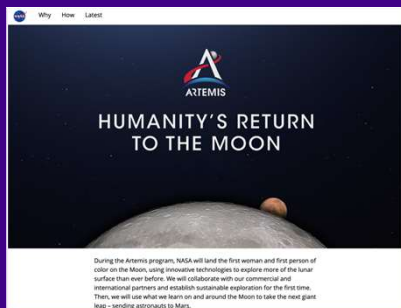
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