Artemis & the Future of Space Exploration

DR. DON KRUPP
Associate Program Manager
Human Landing System Program
NASA Marshall Space Flight Center



We’re going to the Moon

to learn to live on other planets,
for the benefit of all humanity.

With Artemis, NASA will put the first woman and first person of color on the lunar surface, build a long-term presence there and in lunar orbit, and make new scientific discoveries about our solar system.


NASA Astronaut Tracy Caldwell Dyson

Why the Moon?

Exploring the Moon leads to new discoveries and returns incredible value to humanity

- Establishes American leadership and strategic presence
- Inspires a new generation and builds careers in STEM
- Advances civilization by revolutionizing science and technology
- Creates opportunity and economic growth
- Prove technology and capabilities for sending humans to Mars



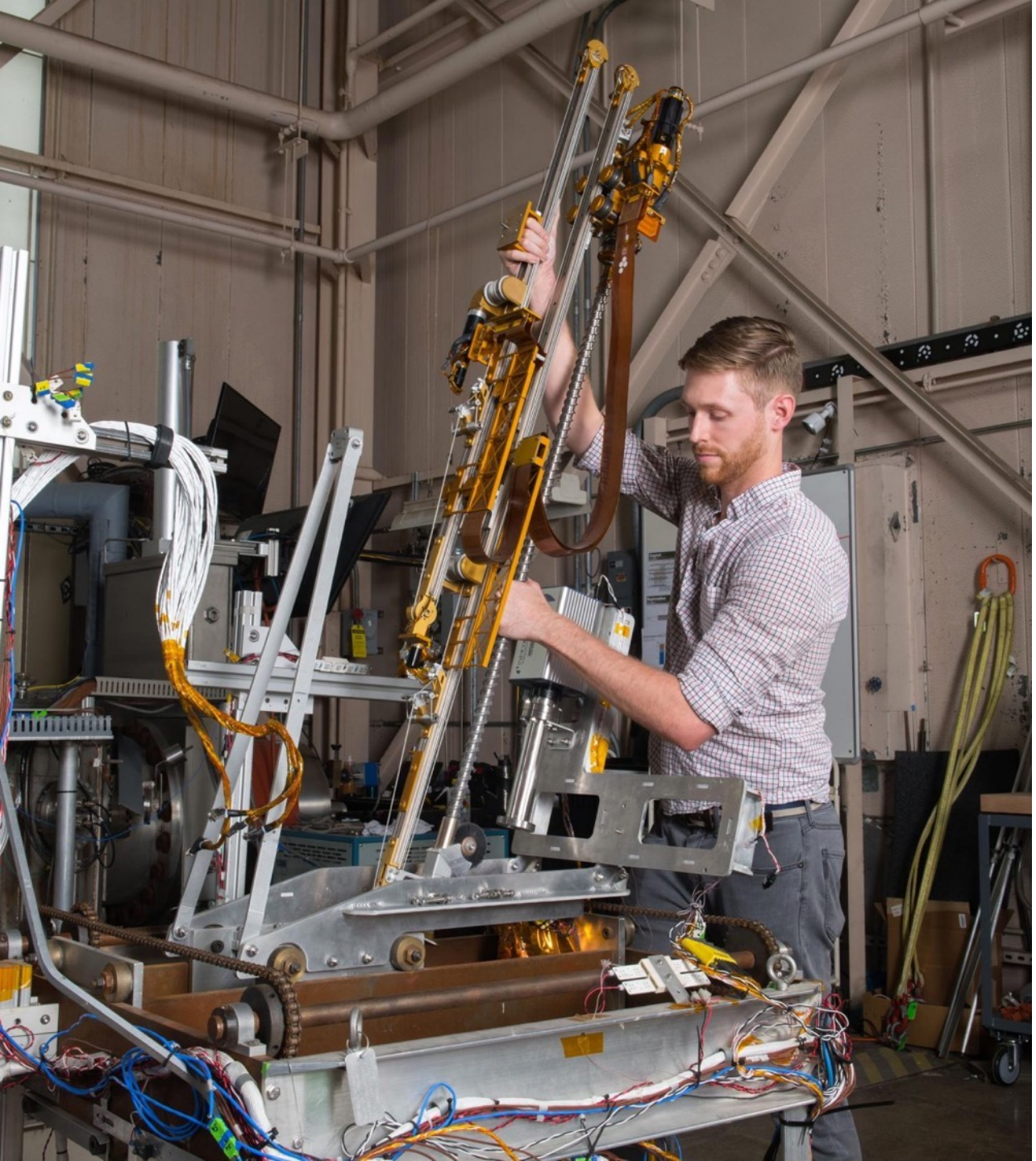
Apollo 12 Lunar Module



Artemis Science Objectives

- Understand planetary processes
- Understand the character and origin of lunar polar volatiles
- Interpret impact history of Earth-Moon system
- Reveal the record of the ancient sun and our astronomical environment
- Observe the universe and the local space environment from a unique location
- Conduct experimental science in the lunar environment
- Investigate and mitigate exploration risks

Pictured left: NASA astronaut candidates and field instructors hike during geology training in Arizona



Artemis Technology Objectives

The **Lunar Surface Innovation Initiative (LSII)** works across industry, academia and government through in-house efforts and public-private partnerships to develop transformative capabilities like:

- In-situ resource utilization (ISRU)
- Surface power
- Dust mitigation
- Extreme environment
- Extreme access
- Excavation and construction

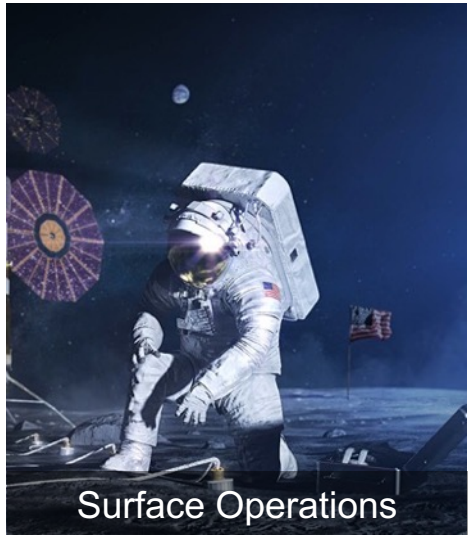
Pictured left: A Honeybee Robotics systems engineer installs The Regolith and Ice Drill for Exploring New Terrain (TRIDENT) on a trolley for thermal vacuum chamber testing. TRIDENT will drill up to three feet deep, extracting lunar soil and demonstrating a critical capability for future ISRU.

Artemis: A Foundation for Deep Space Exploration


Space Launch System


Orion spacecraft


Human Landing System


Surface Operations


Gateway



Exploration Ground Systems


Space Communications & Navigation


Surface Mobility


Spacesuits


Artemis Base Camp



Artemis I Mission Highlights:

First flight of SLS and Orion

Uncrewed flight test of the Space Launch System (SLS) rocket, Orion spacecraft, and Exploration Ground Systems (EGS) at Kennedy Space Center

- Operate systems in flight environment
- Demonstrate Orion heatshield at lunar re-entry conditions
- Retrieve Orion spacecraft

Artemis II Mission Highlights:

First crewed flight of SLS and Orion

- Fly up to four astronauts to cislunar space for the first time in more than 50 years
- Return the crew safely after the mission
- Perform a lunar flyby
- Perform rendezvous and proximity operations
- Retrieve Orion spacecraft





Artemis III Highlights:

First woman on the Moon

- First humans on the Moon’s South Pole
- Return the crew safely home after the mission
- First moonwalk in more than 50 years
    - Rock and soil samples
    - Atmosphere samples
    - Geological data
    - Photos and videos
- Retrieve Orion spacecraft



Advanced SUITS

- Increased flexibility for exploring new regions and advanced sample collection
- Increased size range and modular design accommodate a wider range of crew members
- Rechargeable systems enable more spacewalks and longer stays on surface
- Specialized tools to collect quality samples and returned them safely to Earth
- NASA has selected Axiom Space and Collins Aerospace to build the next generation of spacesuit and spacewalk systems

Pictured left: Artist's render of an astronaut inspecting potential locations to collect samples on the lunar surface

GATEWAY



BASE CAMP

A truly sustainable infrastructure on the lunar surface

- A pressurized rover expands exploration range
- A surface habitat enables longer duration stays
- Supported with small logistics landers including commercial lunar payloads services
- A wide range of opportunities for international partnerships
- Science investigations, technology demonstrations, and operational analogs for Mars missions



Lunar Terrain Vehicle

L T V

An unpressurized rover will expand exploration area, enable groundbreaking discoveries, and provide autonomous or remote operations when crew are not on the surface.

Pictured left: Artist's render of LTV on the lunar surface

Pressurized Rover

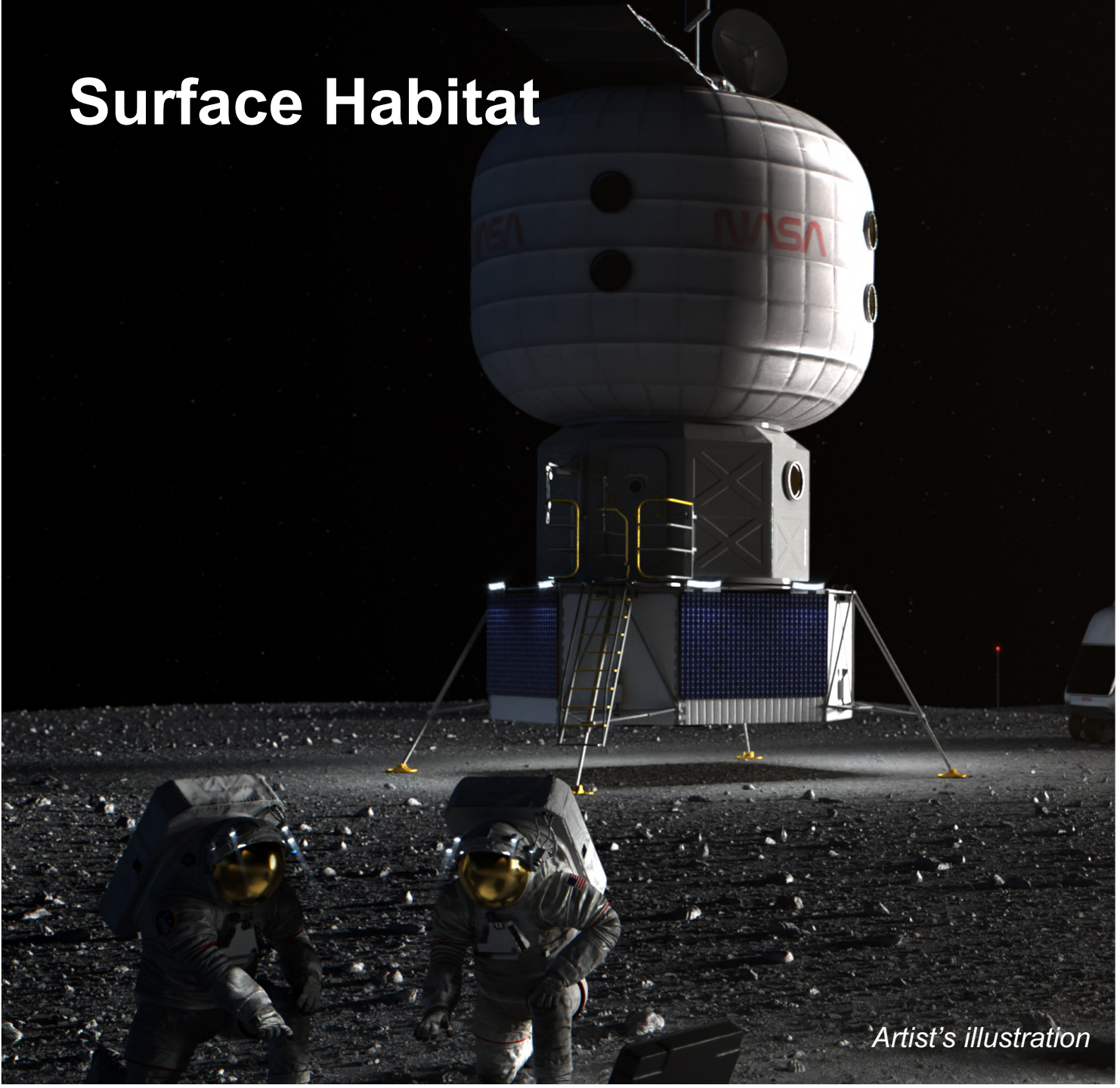


Artist's illustration

Provides pressurized mobile habitation to enable long-range surface exploration in shirtsleeve environment and quick and easy access to surface.

- Habitation for 30 days for 2 crew
- Rear suitport allows astronaut egress and ingress of the vehicle via the spacesuits, leaving the suits outside the pressurized volume
- Provides volume for spares and logistics
- Power generation and energy storage for lunar environment
- Dust and radiation protection
- Reuse for multiple missions of 10-year lifetime
- Capability also identified in current concepts for first human mission to Mars

Surface Habitat



Artist's illustration

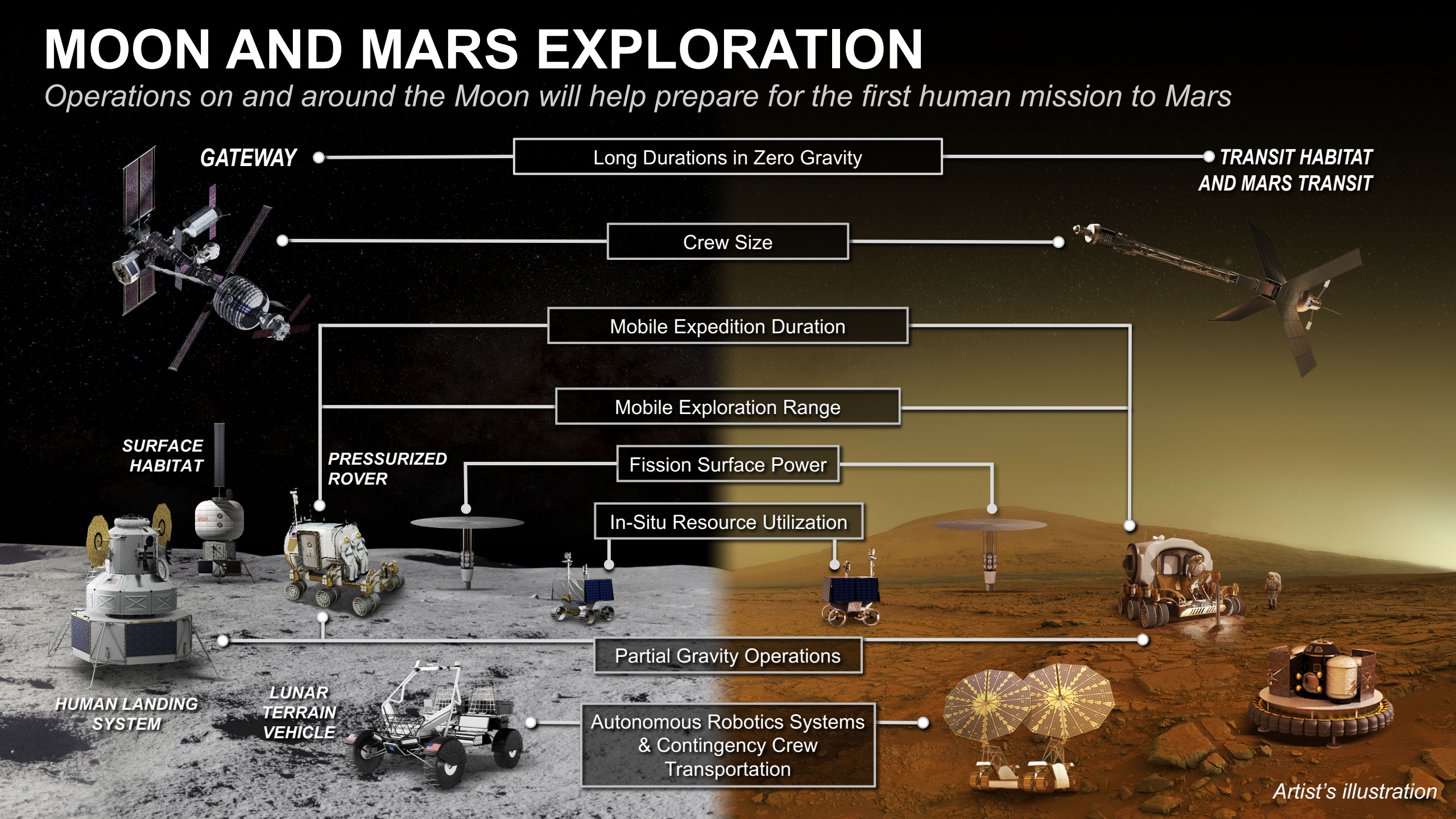
Will be a primary asset to achieve a sustained lunar presence.

NASA is working with industry to develop conceptual designs for the Surface Habitat.

- 2-4 crew – medical, exercise, galley, crew quarters, stowage
- 30-60 day capable habitat
- EVA capable via air lock with suit maintenance capability
- Power generation, recharge capability for surface assets
- Communication hub for surface assets
- Reuse for multiple missions of 15 year lifetime

MOON AND MARS EXPLORATION

Operations on and around the Moon will help prepare for the first human mission to Mars



Artist's illustration

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