

# Lunar Living – The Next Giant Leap

As part of the Vision for Space Exploration, NASA is dedicated to the goal of returning to the moon before 2020. NASA envisions short sorties at first, with longer expeditions of expanding scope as experience grows.

The initial sortie missions will last up to seven days, performing science investigations, resource utilization experiments and technology demonstrations on the surface, before safely returning the crew to Earth. Sortie missions could investigate diverse science sites, or return to a single site to begin the deployment of a permanent outpost. As the buildup of the outpost infrastructure is taking place, mission duration would continue to be extended – from initial outpost missions spanning an entire lunar day (28 Earth days) to permanent crew rotations that eventually would grow to six months on the lunar surface.

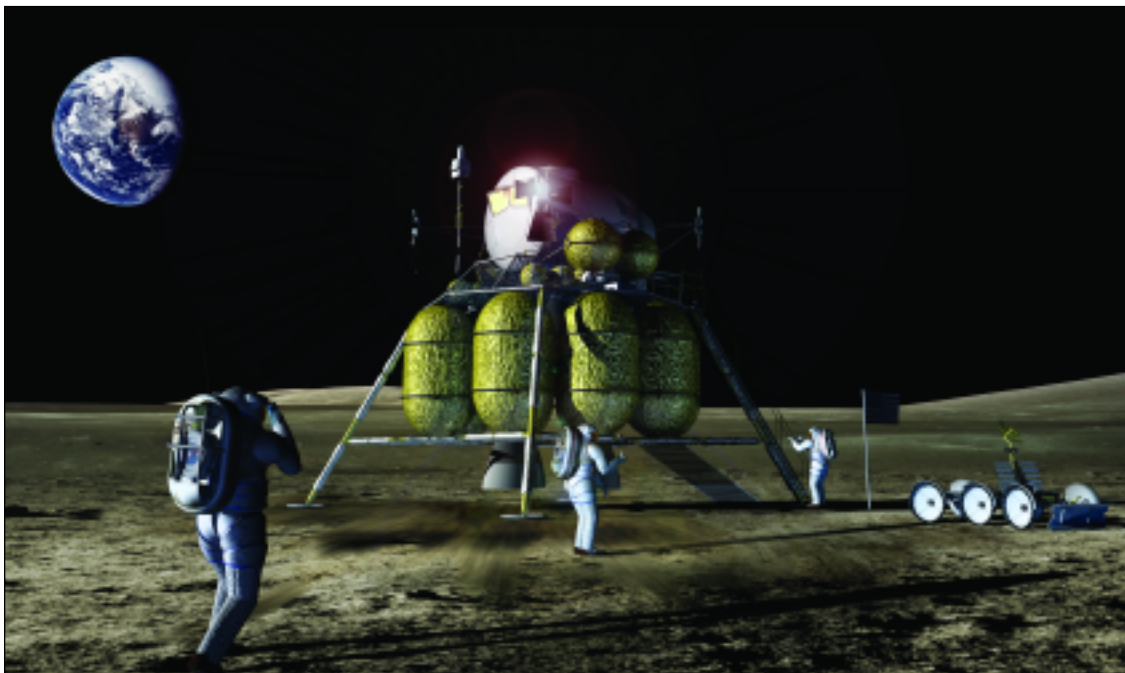
To begin to make living on the moon a reality, NASA is developing two low-fidelity mockups at Johnson Space Center. These mockups will lay the groundwork for engineers and scientists

to evaluate various options for future lunar habitats that will house astronauts. Using these habitats, lunar crewmembers will embark upon missions to the moon's surface that will uncover more of the moon's mysteries, teach us how to use lunar resources and gather information to aid in one of NASA's long-term goals of sending humans to Mars.

## Lunar Sortie Mission

Lunar sortie missions of up to seven days will be conducted from a lunar lander that will include a habitable crew cabin that will support a short surface stay on the moon. The lander will provide a small habitable area with basic galley, waste collection, sleep berths, stowage and medical care capabilities. Lunar sortie missions will establish the capability to conduct human exploration missions to any location on the moon without a pre-existing surface structure. These missions might be used to conduct human exploration of potential lunar outpost sites before more permanent surface infrastructure is delivered.

# NASAfacts



*Before the end of the next decade, NASA astronauts will again explore the surface of the moon. And this time, they're going to stay, building outposts and paving the way for eventual journeys to Mars and beyond. Plans call for four astronauts to land on the moon in the new lander, as illustrated by this artist's concept.*



*This artist's rendering represents a concept of possible activities during future space exploration missions. It depicts a crew preparing to leave a work site on the lunar surface.*

## Lunar Outpost Mission

For longer lunar missions that might range from one to six months, a more permanent habitat is needed. The lunar outpost will allow crews of up to four astronauts to conduct long-duration surface science, technology demonstrations, extended extravehicular activity and the testing of operational techniques. The outpost habitat would be delivered to a permanent surface location and provide more robust crew accommodations than could be delivered on sortie landers, including resource recycling and an overall larger habitat volume. The outpost habitat will be reused over multiple expeditions, and as a result will function during active periods when crew is present, and be placed in a dormant mode when it is not in use. Ultimately, the goal of the lunar outpost is continuous presence of surface crews.

## Lunar Habitation Mockups

To help NASA evaluate various options to accomplish these sortie and outpost missions, two distinct mockups have been built at Johnson Space Center. The Lunar Habitation Vertical Mockup is a three-level structure. The base level represents the habitat hub and an airlock that allows access to the lunar surface. The next level includes living and recreational space and the top level is intended for workspace. In comparison, the Lunar Habitation Horizontal Mockup is long and cylindrical in size, bearing resemblance to a space station module.



*Habitation Systems Lead Larry Toups stands in front of the Lunar Habitation Vertical Mockup at Johnson Space Center while holding a model of the structure.*

Both mockups were created to provide a physical space, one oriented vertically the other horizontally, to compare different layouts and identify advantages or disadvantages of both. The resulting vertical and horizontal layouts will enable NASA scientists, engineers and astronauts to develop the best possible environment for living and working on other planetary surfaces regardless if it's a sortie or outpost mission.

*For more information about NASA, visit: [www.nasa.gov](http://www.nasa.gov)*

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