

NASA unveils flexible, one-size-fits-all space suits

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Prototypes of the Orion Crew Survival Suit (R), which will be worn on the way to the Moon, and the Exploration Extravehicular Mobility Unit (xEMU) to be worn on the surface

Bye bye to bunny hops: when US astronauts next touch down on the Moon, expect them to walk almost as they do on Earth, thanks to a new generation of spacesuits offering key advantages over those of the Apollo-era.

Prototypes of the Orion Crew Survival Suit that will be worn on the journey and the Exploration Extravehicular Mobility Unit (xEMU) for the [lunar surface](#) were unveiled at NASA's Washington headquarters Tuesday ahead of the agency's planned return to the Moon by 2024.

Standing in front of a giant US flag, spacesuit engineer Kristine Davis wore a pressurized red, blue and white xEMU suit, showing off a vastly improved range of motion thanks to bearings systems on the waist, arms, and legs.

They are also extendable and therefore one-size-fits-all, meaning there won't be a repeat of an embarrassing flub in March that caused the first all-female spacewalk to be aborted when a second medium-sized suit wasn't available.

"If we remember the Apollo generation, we remember Neil Armstrong and Buzz Aldrin, they bunny hopped on the surface of the Moon," NASA administrator Jim Bridenstine told a hall filled with students and interns at the [space agency](#).

"Now we're going to be able to walk on the surface of the Moon, which is very different from the suits of the past."

Another key innovation is the xEMU's unlimited capacity to absorb carbon dioxide, a byproduct of respiration that is also poisonous in high quantities.

NASA's new space suite
 Prototype for the new lunar surface Exploration Extravehicular Mobility Unit (xEMU) unveiled "a miniature spaceship shaped like a human body"

- Portable life support system**
 Includes:
 Power source
 Water tank for a cooling system
 Two-way radio
 Unlimited capacity to absorb CO₂
 Designed to provide full life support for up to six days
- Helmet**
 Visor with gold coating to protect from sun's rays
 Ventilation system that provides oxygen
- Display control module**
 "The brains of the suit" houses control panel which operates the life support system
- Gloves**
 Equipped with heaters for fingers, while allowing for dexterity
- Hard upper torso**
 Connects together the different systems of the suit
 Improved range of motion on waist, arms, legs
 One-size-fits-all: extendable
- Lower torso**
 Keeps legs and feet safe from the harsh environment

Under the **Artemis mission**, NASA plans to land on the Moon's South Pole in order to exploit its water ice, discovered in 2009, both for life support purposes and to split into hydrogen and oxygen for use as rocket propellant

Photo: Andrew Caballero-Reynolds
 Source: NASA

Graphic of NASA's Exploration Extravehicular Mobility Unit (xEMU) for the lunar surface



Advance space suit engineer, Kristine Davis (R), waves next to space suit engineer Amy Ross (L) during a press conference displaying NASA's next generation of space suits

It achieves this through a system that both absorbs and then removes the gas into the vacuum of space, unlike current systems that merely absorb it until it reaches a saturation point.

The crew survival [suit](#), meanwhile, is designed to provide full life support for up to six days—a scenario that could be required, for example, if a meteorite punches a hole in the spacecraft's hull.

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The agency views its return to the Moon as a proving ground for an onward mission to Mars in the 2030s.

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