

NASA's new space suit

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In news— Recently, NASA has unveiled a new spacesuit for its upcoming moon missions.

About the new spacesuit-

- For the upcoming Artemis missions, NASA's first attempt at landing astronauts on the moon since 1972, the spacesuit used will see a significant upgrade.
- Unlike the bulky and iconic suits in which Neil Armstrong and Buzz Aldrin skipped around on the lunar surface, **the new suit will be "more nimble, comfortable** and designed to fit a broader array of body types.
- **The suit comes from Axiom Space**, a private company based out of Houston, Texas, though it incorporates design elements used in previous suits by NASA.
- **It will be worn during the Artemis III mission, the program's first moon landing**, which is scheduled for 2025. It is called the AxEMU (Axiom Extravehicular Mobility Unit).
- New space suits most noticeable upgrade was in the mobility offered by the new spacesuits.
- Furthermore, the **large clear bubble around the head provides a much wider range of visibility as well as lighting**, which will be important when astronauts step into shadowed craters near the lunar south pole, where NASA hopes to study water ice. **The headpiece also has a mount for a high-definition camera.**
- Another important feature of the suit is its design which fits a broader range of body types comfortably, with provisions to make more specific adjustments in fit.
- As far as protection goes, the increased mobility has not come at its cost. The AxEMU has been specifically designed to better deal with lunar dust.

Significance of a space suit-

- **Without a spacesuit, humans will not survive for long in the harsh conditions of outer space or the lunar surface.**
- First, spacesuits **protect the human body from the extreme temperature** fluctuations of space. In absence of an atmosphere, areas which receive direct sunlight become extremely hot whereas areas in the dark are frigid. The first job of a space suit is to **insulate the astronaut inside from the extreme temperatures.**
- Second, spacesuits also provide astronauts with a **constant supply of air and optimum air pressure** around their body. They are pressurised to this effect, making them more like human shaped space vehicles than a piece of clothing.
- Third, spacesuits **protect astronauts from space radiation which can be extremely harmful**, as well as micrometeorites and other particles moving across space, often at incredible speeds.
- On the lunar surface, **suits also protect astronauts from lunar dust**, considered by NASA experts as the “**number one environmental problem on the moon**”. **Much more abrasive than dust on earth**, it tends to corrode everything it comes into contact with and can potentially cause lung diseases.
- By **helping astronauts survive even in the harshest conditions of space**, spacesuits allow them to perform tasks in space, carry out experiments and fulfill the objectives of their mission.

Some of the issues with older space suits-

- The Apollo missions (1961-72) were a landmark achievement in space exploration. The spacesuits worn in the mission were also revolutionary for the time.
- Unlike rudimentary spacesuits used for previous space

missions, the Apollo suits had their own life support systems and did not balloon when exposed to the vacuum of space.

- They also incorporated boots ideal for walking on the lunar surface. Technological tweaks aside, little has changed in the fundamentals of suits for spacewalking that are used in the International Space Station.
- However, these **suits are rigid and uncomfortable to be in. While rubberised bellows at the shoulders, elbows, hips and knees allowed a degree of flexibility, astronauts struggle against the stiffness.**
- This is why Armstrong and Aldrin soon discovered that “skipping” was easier than “walking” on the lunar surface, as it did not require bending knees.
- **Long handles were used in various tools as bending the waist was nearly impossible**, though even holding things is difficult due to the gloves worn.