



Gateway Lunar Orbiting Outpost

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Why in News

Recently, the **National Aeronautics and Space Administration (NASA)** has finalised the contract to design the **Habitation and Logistics Outpost (HALO)** for its Gateway Lunar Orbiting Outpost.

The **Habitation and Logistics (HALO) support** for the Gateway, is a part of **NASA's Artemis program** that **aims** to send the **first woman** and the next man to the **Moon by 2024**.

Key Points

- **Habitation and Logistics (HALO)**
 - It refers to the **pressurised living quarters where astronauts will spend their time** while visiting the Gateway.
 - These quarters will be **about the size of a small apartment and will provide augmented life support** together with Orion spacecraft.
- **The Gateway:**
 - NASA has targeted the **completion of the Gateway for 2026**, while work on the spaceship is already underway.
 - The **Gateway can be used at least once per year** and astronauts can not stay around the year like they do on the International Space Station (ISS).
 - Once docked to the Gateway, astronauts will be able to **stay there for three months at a time**.
 - Compared to the ISS, **the Gateway is much smaller**.

- **Significance:**
 - It will act **as an airport**, where **spacecraft bound for the lunar surface of Mars can refuel or replace parts** and resupply things like food and oxygen, allowing astronauts to **take multiple trips** to the **Lunar surface and exploration** of new locations across the Moon.
 - By studying the **geology of the Earth, the Moon, and Mars** – the three planetary bodies and the ways in which they are similar and different from each other, it would give a **sight about how planets and planetary systems form**.
 - Significantly, Gateway **would work as a science platform to look back** at the Earth, observe the Sun, and get unobstructed views of the vast universe.

Gateway Lunar Orbit Outpost

- The Gateway is a **small spaceship that will orbit the Moon**, meant for astronaut missions to the Moon and later, for **expeditions to Mars**.
- It will act as a **temporary office and living quarters for astronauts**, distanced at about 250,000 miles from Earth.
- The spaceship will have **living quarters, laboratories for science and research and docking ports** for visiting spacecraft.
- One of the most **unique features** of the Gateway is that it can be **moved to other orbits around the Moon** to conduct more research.
- It is expected to play a major role in NASA's Artemis program, after 2024.
- While the project is led by NASA, the Gateway is meant to be developed, serviced, and utilized in collaboration with commercial and international partners: Canada (**Canadian Space Agency**), Europe (**European Space Agency**), and Japan (**JAXA**).

The Artemis

- It is a crewed spaceflight program of NASA that has the goal of landing **"the first woman and the next man" on the Moon**, specifically at the **lunar south pole** region by 2024.
- It is a key step towards the long-term goal of establishing a sustainable presence on the Moon, laying the foundation for private companies to build a lunar economy, and eventually sending humans to Mars.

Orion Spacecraft

- It is being developed by **NASA**.
- It is a **powerful, advanced launch vehicle** for a new era of human exploration beyond Earth's orbit.

- It is designed to take astronauts to deep space destinations such as the Moon and Mars.

Way Forward

- As NASA sets its sights on returning to the Moon, and preparing for Mars, it is developing **new opportunities in lunar orbit** to provide the **foundation for human exploration deeper into the solar system.**
- It would also support the **technology maturation and development of operating concepts** needed for missions beyond the Earth and Moon system.
- Building the Gateway with **commercial and international partners** is a critical component of sustainable lunar exploration and the Artemis program.
- So, the partnership would give a **strategic presence of humans** in space.

Source: IE