

1. James Webb Space Telescope

Why in News?

- The James Webb Space Telescope, launched in 2021, has recently captured a clear image of the planet Uranus and its rings.

Highlights

- Uranus is an ice giant due to the chemical makeup of its interior, with most of its mass being a hot and dense fluid of icy materials like water, methane, and ammonia.
- Uranus rotates on its side, with a roughly 90-degree angle from the plane of its orbit. This leads to extreme seasons and long periods of sunlight and darkness.
- Uranus is among only two planets in our solar system that rotate clockwise along with Venus. The planet takes 84 earth years to orbit the Sun.
- Uranus has 13 rings, with 11 visible in the image. Some of the rings are very bright and close together, appearing as a larger ring.
- The planet also has 27 known moons.
- Uranus has a unique polar cap that appears during summer and vanishes in the fall. Webb's data can help scientists understand this mechanism.
- In 1986, NASA's Voyager 2 made the first – and so far, the only – visit to Uranus.
- New Horizons passes the orbit of Uranus on its way to Pluto, becoming the first spacecraft to journey beyond Uranus' orbit since Voyager 2.
- The James Webb Space Telescope (JWST) is a large, infrared telescope designed to observe the most distant objects in the universe.
- The JWST is the successor to the Hubble Space Telescope.
- It is a collaboration between NASA, the European Space Agency (ESA), and the Canadian Space Agency (CSA).
- The telescope was launched in December 2021 and is currently at a point in space known as the Sun-Earth L2 Lagrange point, approximately 1.5 million km beyond Earth's orbit around the Sun.
- Lagrange Point 2 is one of the five points in the orbital plane of the Earth-Sun system.
- Lagrange Points are positions in space where the gravitational forces of a two-body system (like the Sun and the Earth) produce enhanced regions of attraction and repulsion.
- Its primary mission is to study the early universe, the formation of galaxies, stars, and planets, and the atmospheres of exoplanets.