James Webb Space Telescope

December 24, 2021

In news-James Webb Space telescope has finally been confirmed to launch on December 25.

About the telescope-

- The $10 billion telescope is a space telescope being **jointly developed by the European Space Agency (ESA), Nasa and the Canadian Space Agency.**
- The biggest telescope set to **observe the universe** will be **launched onboard the powerful Ariane-5 rocket** from Europe's Spaceport in French Guiana.
- Once operational, Webb will solve mysteries in our solar system, look beyond distant worlds around other stars, and **probe the mysterious structures and origins of our universe and our place in it.**
- It is planned to succeed the Hubble Space Telescope as NASA's flagship astrophysics mission.
- **Webb has two primary scientific missions,** which together will account for more than 50 percent of its observation time.
    - First, **explore the early phases of cosmic history, looking back in time to only a few hundred million years after the Big Bang.** Astronomers want to see how the very first stars and galaxies formed, and how they evolve over time.
    - Its second major goal is the **discovery of exoplanets, meaning planets outside the solar system. It will also investigate the potential for life on those worlds** by studying their atmospheres.
- It will **provide improved infrared resolution and sensitivity over Hubble.**
- Unlike Hubble, the current premier space telescope that revolves around the planet, Webb will orbit the Sun.

- **It will remain directly behind Earth, from the point of view of the Sun,** allowing it to remain on our planet's night side.
- The telescope's centerpiece is **its enormous primary mirror, a concave structure** 21.5 feet (6.5 meters) wide and made up of 18 smaller **hexagonal mirrors.**
- **They're made from beryllium coated with gold**, optimized for reflecting infrared light from the far reaches of the universe.
- The observatory also **has four scientific instruments, which together fulfill two main purposes:** imaging cosmic objects, and spectroscopy -breaking down light into separate wavelengths to study the physical and chemical properties of cosmic matter.
- It will be **deployed at the second Lagrange point (L2) orbiting the sun** roughly 15,00,000 kilometers away from Earth.
- It will **finally reach its intended orbit, the Lagrange-2 point, a month after it leaves the planet.**