

4. Water Found For First Time on Potentially Habitable Planet

Prelims: Science & Technology- Space

Mains: GS-III- Awareness in the fields of IT, Space, Computers, Robotics, Nano-Technology, Bio-Technology and Issues Relating to Intellectual Property Rights.

Why in News?

- ▶ Astronomers have for the first-time discovered water in the atmosphere of an exoplanet with Earth-like temperatures that could support life.

Highlights:

- ▶ K2-18b is the only planet orbiting a star outside the Solar System known to have both water and temperatures that could be potentially habitable.
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- ▶ The discovery is the first successful atmospheric detection for an exoplanet orbiting in its star's 'habitable zone', at a distance where water can exist in liquid form, they said.
- ▶ The team used archive data from 2016 and 2017 captured by the ESA/NASA Hubble Space Telescope and developed open-source algorithms to analyse the starlight filtered through K2-18b's atmosphere.
- ▶ The results revealed the molecular signature of water vapour, also indicating the presence of hydrogen and helium in the planet's atmosphere.
- ▶ K2-18b's size and surface gravity are much larger than Earth's. Its radiation environment, too, maybe hostile. They believe that other molecules including nitrogen and methane may be present but, with current observations, they remain undetectable.

K2-18b:

- ▶ K2-18b was discovered in 2015 and is one of hundreds of super-Earths — planets with a mass between Earth and Neptune — found by NASA's Kepler spacecraft.
- ▶ Exoplanet K2-18b is eight times the mass of Earth.
- ▶ The planet orbits the cool dwarf star K2-18, which is about 110 light years from Earth in the Leo constellation. However, the researchers said, "K2-18b is not 'Earth 2.0' as it is significantly heavier and has a different atmospheric composition.
- ▶ They also said that further studies are required to estimate cloud coverage and the percentage of atmospheric water present.