

## WASP-94A b - Exoplanet

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### Why in News?

According to a recent study, scientists were able to use the NASA James Webb Space Telescope (JWST) to peer closely at an exoplanet nearly 700 light-years away and decipher the weather patterns on it.

- **WASP-94A b** - It is *an exoplanet*, like a gas giant with scorching atmospheric temperatures, which are called '*hot Jupiters*'.

**Exoplanet** - An exoplanet/extrasolar planet is any planet that *exists outside our solar system*, which orbits other stars, orbits binary star systems, or drifts freely through the cosmos as "rogue planets."

- **Size & Mass** - It is almost *twice as large as Jupiter* but with only half the mass.
- **Orbit** - It orbits very close to its parent star — so close that it takes just four days to complete a whole revolution.
- **Tidally locked** - They have their orbits tidally locked, meaning their rotation is *synchronised with their revolution* (like Earth's Moon).
- As a result, the same side of the planet always faces the host star, much like the moon's tidally locked orbit keeps one side always facing the Earth.
- **Weather Cycle Findings** - WASP-94A b in particular has a *dynamic weather system*.
- **Mornings & Evenings** - Are covered in clouds of magnesium silicate, iron, and magnesium sulphide, while the evenings sport clear skies.
- The clouds appear to form on the cooler night side of the planet, sweep across the globe with extremely fast winds, and then disappear as they reach the hotter dayside.
- **Day vs Night Temperature Conditions** - Its dayside is a blazing desert with rock-melting temperatures, while its nightside remains pitch-dark and frozen, dipping close to absolute zero.
- **How JWST Detected This?** - Used *spectroscopy* where light is split up into its various wavelengths, followed by measuring the intensity of each one.
- If the planet has an atmosphere, it will absorb some of the light; this will create a gap in the set of wavelengths arriving at the spectrometer.
- **JWST Breakthrough** - This is the *first direct measurement* of such an extreme weather cycle on an exoplanet, offering new insights into planetary atmospheres and evolution far beyond our Solar System.

To know about the James Webb Telescope, click [here](#)

## **Reference**

[The Hindu | Webb telescope captures weather on exoplanet 700 lightyears away](#)

