

Hubble finds a new Jupiter-like planet

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In news— Recently, NASA's Hubble Space Telescope has directly photographed evidence of a Jupiter-like protoplanet forming.

Key updates-

- This discovery supports a long-debated theory for how planets like Jupiter form, called “disk instability,”.
- The **disk instability model is for giant planet formation where a protoplanetary disk becomes dense and cool enough to be unstable to gravitational collapse** and thereby resulting in the formation of a gaseous protoplanet.
- A **protoplanetary or circumstellar disc is a disc of gas and dust orbiting a newly formed star**, out of which planets are hypothesized to form.
- According to the Disk Instability theory, **matter slowly moves inwards in this disc as dust particles grow** to centimeter-sized pebbles.
- This is seen as the **first step towards the formation of kilometer-sized planetesimals** that eventually come together to form planets.
- **The newly forming planet captured by Hubble is called AB Aurigae b and embedded in a protoplanetary disk with distinct spiral structures** swirling around and surrounding a young star that is estimated to be about 2 million years old.
- That is also about the same age our solar system was when planet formation was underway.
- This protoplanet is **probably around nine times the size of Jupiter** and orbits its host star at a distance of 8.6 billion miles, over two times the distance between our Sun and pluto.
- This **new discovery presents strong evidence that some**

gas giant planets can form by the disk instability mechanism.

- The observations are also in striking contrast to the expectation of planet formation by the widely accepted core accretion model.
- Hubble provided a time baseline, combined with Subaru data, of 13 years, which was sufficient to be able to detect orbital motion.
- This discovery also paves the way for future studies into the chemical composition of protoplanetary discs like AB Aurigae b.

Jupiter-

- Jupiter is the **largest planet in the solar system**.
- Jupiter is so large that all of the other planets in the solar system could fit inside it. More than 1,300 Earths would fit inside Jupiter.
- It is the **fifth planet from the sun and its** average distance from the sun is 5.2 astronomical units, or AU.
- When viewed from Earth, **Jupiter is usually the second brightest planet in the night sky, after Venus**.
- The planet is **named after Jupiter, the king of the Roman gods in mythology**.
- It is also called a gas giant planet and its **atmosphere is made up of mostly hydrogen gas and helium gas, like the sun**.
- The planet is covered in thick red, brown, yellow and white clouds and the clouds make the planet look like it has stripes.
- One of Jupiter's **most famous features is the Great Red Spot**, a giant spinning storm, resembling a hurricane.
- It **rotates, or spins, faster than any other planet**.
- **One rotation equals one day** and Jupiter's day is only about 10 hours long.
- Its orbit around the sun is elliptical, or oval-shaped.
- Jupiter takes 12 Earth years to make one revolution

around the sun, so one year on Jupiter is equal to 12 years on Earth.

- **It has 53 named moons.** Scientists have discovered 26 more but those do not have official names.
- Hence Scientists now think Jupiter has 79 moons and the most recent moons were discovered in 2017.
- **The planet's four largest moons are** Ganymede, Callisto, Io (eye-OH), and Europa.
- These four moons are called the **Galilean satellites** as Italian astronomer **Galileo Galilei discovered these moons** in 1610.
- **The largest of Jupiter's moons is Ganymede.** It is the **largest moon in the solar system** and is larger than the planet Mercury and three-fourths the size of Mars.
- Ganymede is **the only moon in the solar system known to have its own magnetic field.** Ganymede and Callisto have many craters and appear to be made of ice and rocky material.

Further reading: <https://journalsofindia.com/hubble-telescope/>