

INDIAN SCIENTISTS DISCOVERS NEW EXOPLANET WITH MASS 13 TIMES THAT OF JUPITER

Relevant for: Science & Technology | Topic: Space Technology & related matters

To enjoy additional benefits

CONNECT WITH US

May 30, 2023 08:52 pm | Updated 10:53 pm IST - Bengaluru

COMMENTS

SHARE

READ LATER

An artist's concept of the TOI 4603b, a gas giant exoplanet that orbits an F-type star. Its mass is 12.89 Jupiters and it takes 7.2 days to complete one orbit of its star. Photo: exoplanets.nasa.gov

A new Jupiter-size exoplanet with the highest density known till this date and mass 13 times than that of Jupiter, has been discovered by an international team of scientists led by Prof. Abhijit Chakraborty at the Exoplanet Research Group of the Physical Research Laboratory (PRL), Ahmedabad.

An exoplanet is any planet beyond the solar system and the planet discovered by scientists from India, Germany, Switzerland and the USA is with a density of $\sim 14 \text{ g/cm}^3$. Massive giant exoplanets are those having mass greater than four times that of Jupiter.

[ISRO said](#) that the discovery of this massive exoplanet was made using the indigenously made PRL Advanced Radial-velocity Abu-sky Search spectrograph (PARAS) at the 1.2 m telescope of PRL at its Gurushikhar Observatory in Mt. Abu by measuring the mass of the planet precisely.

The newly discovered exoplanet is found around the star called TOI4603 or HD 245134. NASA's The Transiting Exoplanet Survey Satellite (TESS) initially declared TOI4603 as a possible candidate to host a secondary body of unknown nature.

Using PARAS, scientists discovered it as a planet by measuring the mass of the secondary body and hence, the planet is called TOI 4603b or HD 245134b. It is located 731 light years away. It orbits a sub-giant F-type star TOI4603 every 7.24 days.

"What sets this discovery apart is that the planet falls into the transition mass range of massive giant planets and low-mass brown dwarfs with masses ranging from 11 to 16 times the mass of Jupiter. Only fewer than five exoplanets are currently known in this mass range so far," ISRO said.

The newly discovered [exoplanet TOI 4603b](#) is one of the most massive and densest giant planets that orbits very close to its host star at a distance less than 1/10th the distance between our Sun and Earth.

The figure on the left shows an artistic impression comparing the distances between the TOI-

4603 star-planet system and the Sun-Mercury and Sun-Jupiter systems. It is noteworthy that the TOI-4603b planet, which has the same size as Jupiter, is situated more than 50 times closer to its star than Jupiter is to the Sun. On the right is a comparison between the TOI-4603b planet and Jupiter, which is 13 times more massive than Jupiter. Photo: *ISRO*

The exoplanet with a surface temperature of 1670 K is likely undergoing high-eccentricity tidal migration with an eccentricity value of approximately 0.3. The detection of such systems provides valuable insights into the formation, migration, and evolution mechanisms of massive exoplanets.

This discovery marks the third exoplanet discovery by India, and by the PRL scientists using PARAS spectrograph and the PRL 1.2m telescope, following the discoveries in 2018 (K2-236b) and 2021 (TOI-1789b).

COMMENTS

SHARE

BACK TO TOP

Comments have to be in English, and in full sentences. They cannot be abusive or personal. Please abide by our [community guidelines](#) for posting your comments.

We have migrated to a new commenting platform. If you are already a registered user of The Hindu and logged in, you may continue to engage with our articles. If you do not have an account please register and login to post comments. Users can access their older comments by logging into their accounts on Vuukle.

END

Downloaded from **crackIAS.com**

© **Zuccess App** by crackIAS.com