

= WASP @-@ 17b =

WASP @-@ 17b is an exoplanet in the constellation Scorpius that is orbiting the star WASP @-@ 17 . Its discovery was announced on 11 August 2009 . It is the first planet discovered to have a retrograde orbit , meaning it orbits in a direction counter to the rotation of its host star . This discovery challenged traditional planetary formation theory . In terms of diameter , WASP @-@ 17b is the second @-@ largest exoplanet discovered yet , and at half Jupiter 's mass , this makes it the most puffy planet known . On 3 December 2013 , scientists working with the Hubble Space Telescope reported detecting water in the atmosphere of the exoplanet .

= = Discovery = =

A team of researchers led by David Anderson of Keele University in Staffordshire , England , discovered the gas giant , which is about 1 @, @ 000 light years ( 300 parsecs ) from Earth , by observing it in transit its host star WASP @-@ 17 . Such photometric observations also reveal the planet 's size . The discovery was made with a telescope array at the South African Astronomical Observatory . Due to the involvement of the Wide Angle Search for Planets SuperWASP consortium of universities , the exoplanet , as the 17th found to date by this group , was given its present name .

Astronomers at the Observatory of Geneva were then able to use characteristic red shifts and blue shifts in the host star 's spectrum as its radial velocity varied over the course of the planet 's orbit to measure the planet 's mass and obtain an indication of its orbital eccentricity . Careful examination of the Doppler shifts during transits also allowed them to determine the direction of the planet 's orbital motion relative to its parent star 's rotation via the Rossiter ? McLaughlin effect .

= = Special properties = =

WASP @-@ 17b has a radius 1 @. @ 5 ? 2 times that of Jupiter and about half the mass . Thus its mean density is between 0 @. @ 08 and 0 @. @ 19 g / cm<sup>3</sup> , compared with Jupiter 's 1 @. @ 326 g / cm<sup>3</sup> and Earth 's 5 @. @ 515 g / cm<sup>3</sup> ( the density of water is 1 g / cm<sup>3</sup> ) . The unusually low density is thought to be a consequence of a combination of the planet 's orbital eccentricity and its proximity to its parent star ( less than one seventh of the distance between Mercury and the Sun ) , leading to tidal flexing and heating of its interior . The same mechanism is behind the intense volcanic activity of Jupiter 's moon Io .

WASP @-@ 17b is thought to have a retrograde orbit ( with a sky @-@ projected inclination of the orbit normal against the stellar spin axis of about 149 ° , not to be confused with the line @-@ of @-@ sight inclination of the orbit , given in the table , which is near 90 ° for all transiting planets ) , which would make it the first planet discovered to have such an orbital motion . It was found by measuring the Rossiter ? McLaughlin effect of the planet on the star 's Doppler signal as it transited , in which whichever of the star 's hemispheres is turning toward or away from Earth will show a slight blueshift or redshift which is dampened by the transiting planet . Scientists are not yet sure why the planet orbits opposite to the star 's rotation . Theories include a gravitational slingshot resulting from a near @-@ collision with another planet , or the intervention of a smaller planet @-@ like body working to gradually change WASP @-@ 17b 's orbit by tilting it via the Kozai mechanism .