

= Kepler @-@ 9b =

Kepler @-@ 9b is one of the first planets discovered outside the solar system ( exoplanets ) by NASA 's Kepler Mission . It revolves around the star Kepler @-@ 9 within the constellation Lyra . Kepler @-@ 9b is the largest of three planets detected in the Kepler system by transit method ; its mass is slightly smaller than the planet Saturn , and it is the largest planet in its system . Kepler @-@ 9b and Kepler @-@ 9c display a phenomenon called orbital resonance , in which gravitational pull from each planet alters and stabilizes the orbit of the other . The planet 's discovery was announced on August 26 , 2010 .

= = Nomenclature and history = =

Kepler @-@ 9b 's name denotes that it is the first exoplanet discovered in orbit around the star Kepler @-@ 9 . The star , in turn , was named for the Kepler Mission , a NASA project designed to search for Earth @-@ like planets . Kepler @-@ 9 's planets were among 700 planetary candidates collected during Kepler 's first 43 days online . The system in particular was flagged as one of five systems that appeared to have held more than one transiting exoplanet . Kepler @-@ 9b 's discovery was announced on August 26 , 2010 . It was the part of the first confirmed star system in which multiple planets transited the same star .

The planet was confirmed by the Kepler satellite by the transit method , in which the planet passes across the face of its star in relation to Earth , dimming that star 's light by a small amount ; this light difference is then used to determine the planet and several of its characteristics , including size and distance from its home star .

Initial estimates for Kepler @-@ 9b 's mass were refined by the W. M. Keck Observatory at Mauna Kea , Hawaii . In doing so , scientists found that Kepler @-@ 9b is the larger of the two gas planets discovered in the Kepler @-@ 9 system , although in mass it is smaller than planet Saturn .

= = Characteristics = =

Kepler @-@ 9b is a gas planet that has an approximate mass of 0 @. @ 252 MJ ; thus , it is about one @-@ fourth the mass of planet Jupiter . It has a radius of approximately 0 @. @ 842 RJ , or about 80 % the radius of Jupiter . The planet orbits Kepler @-@ 9 every 19 @. @ 243 days , and it lies some .14 AU from the star . To compare , planet Mercury 's average distance from the Sun is .387 AU and takes 87 @. @ 969 days to complete an orbit . Kepler @-@ 9b is the second closest planet to its star in the Kepler @-@ 9 system .

The first known case of orbital resonance in exoplanets has been noted between Kepler @-@ 9b and Kepler @-@ 9c . The two planets , whose orbits correspond in a roughly 1 : 2 ratio , maintain the orbit of the other by gravitational tug . Kepler @-@ 9b 's orbit grows , on average , four minutes longer every orbital period . Eventually , this trend will reverse and increase . Over time , it can be seen that the planets ' orbits oscillate slightly above and below the 1 : 2 ratio . Alycia Weinberger of the Carnegie Institution has stated that the Kepler @-@ 9 gas giants probably formed further away from the star than they are , and the appearance of the orbital resonance phenomenon may help explain the history of their inward migration .