

= Kepler @-@ 9c =

Kepler @-@ 9c is one of the first seven extrasolar planets , exoplanets , discovered by NASA 's Kepler Mission , and one of at least two planets orbiting the star Kepler @-@ 9 . Kepler @-@ 9c and Kepler @-@ 9b were the first exoplanets confirmed to be transiting their star . The planet 's discovery was announced by the Kepler Mission team on August 26 , 2010 after its initial discovery by Kepler . At the time , it was one of 700 planetary candidates noted by Kepler .

Observations of the planet have suggested that it is a hydrogen ? helium gas giant that is slightly smaller than Saturn , and that it orbits nearby its star at .225 AU . Kepler @-@ 9c and b are notable in that the planets share a pattern of orbital resonance , in which the orbit of each planet stabilizes the orbit of the other . During the time it was observed by the spacecraft , the planet 's orbit , which lasts on average approximately 38 days , shortened by 39 minutes every orbital period because of this effect . Its orbit , over time , oscillates slightly above and below a 2 : 1 ratio with planet b .

= = Nomenclature and history = =

As with most exoplanets , the name " Kepler @-@ 9c " denotes that it is the second planet discovered in the orbit of the star Kepler @-@ 9 . Kepler @-@ 9 itself was named after the Kepler Mission , a NASA project oriented towards discovering planets that are transiting their home stars .

The planet was one of 700 planetary candidates considered by Kepler in its first 43 days of operation . It was highlighted as a part of one of five star systems that seemed to hold multiple transiting planets . Kepler @-@ 9c and Kepler @-@ 9b were confirmed as the first planets discovered to transit the same star .

Initial estimates concerning Kepler @-@ 9c 's mass were refined by follow @-@ up observations made by the Keck 1 Telescope at the W.M. Keck Observatory at Mauna Kea , Hawaii . Keck was able to confirm that Kepler @-@ 9c and Kepler @-@ 9b were planets that were slightly smaller than planet Saturn .

= = Characteristics = =

Kepler @-@ 9c is a gas giant that is smaller and slightly less massive than planet Saturn . It is approximately 0 @.@ 171 MJ , or 17 % the mass of planet Jupiter . It also has a radius of 0 @.@ 823 RJ , which makes it slightly smaller (1 @.@ 5 %) than Saturn . The planet is , on average , situated 0 @.@ 225 AU from the star .

It is probable that the planet is composed of hydrogen and helium . The planet orbits on the same plane as Kepler @-@ 9b , a second and larger gas giant located in the Kepler @-@ 9 system . While observing the planet , the Kepler team noticed that Kepler @-@ 9b and c orbited in a 1 : 2 ratio , where Kepler @-@ 9b orbits its star every 19 days and Kepler @-@ 9c orbits every 38 days . The gravitational pull that each planet has on the other , known as orbital resonance , keeps the planets in a stable orbit . This phenomenon is the first of its kind seen outside the Solar System . Every time Kepler @-@ 9c completed an orbit during the observation period , its orbital period decreased by about 39 minutes . At some point , however , this trend will reverse and its orbit will increase . The lengths of its orbit will oscillate slightly above and below the 2 : 1 ratio .