= Kepler @-@ 9d =

Kepler @-@ 9d , formerly known as KOI @-@ 377 @.@ 03 , is a planet in orbit around the sunlike star Kepler @-@ 9 . Initially discovered by Kepler spacecraft , a terrestrial planet @-@ searching satellite built and operated by NASA , Kepler @-@ 9d is most likely a Super @-@ Earth , with an estimated radius approximately 60 % larger than that of Earth 's , although its exact mass cannot be determined . Kepler @-@ 9d orbits Kepler @-@ 9 every 1 @.@ 56 days at a distance of .0273 AU from its star , an extremely close distance . Although Kepler @-@ 9d is the closest planet to its star in its system , it is named Kepler @-@ 9d instead of Kepler @-@ 9b because two gas giants , Kepler @-@ 9b and Kepler @-@ 9c , were confirmed first . The original studies into the system first suggested that Kepler @-@ 9d might be a planet , but a follow @-@ up investigation made by the Kepler team later confirmed that it was ; the confirmation of Kepler @-@ 9d as a planet was made public with the team 's paper , which was published in the Astrophysical Journal on January 1 , 2011 . The team used telescopes at the W.M. Keck Observatory in Hawaii to follow up on the Kepler space telescope 's initial discovery .

= = Discovery and name = =

Kepler @-@ 9d 's name comes from it being the third planet discovered in the orbit of Kepler @-@ 9 . Kepler @-@ 9 was named for the Kepler spacecraft , a NASA satellite that aims to discover terrestrial planets in transit around , or crossing in front of , their host stars as seen from Earth . This transit causes a regular interval in which the star briefly and slightly dims as the planet crosses it .

Flagged initially as a transit event by the satellite , Kepler @-@ 9d was given the designation KOI 377 @.@ 03 . It was recognized as a potential planet after a study into the system confirmed Kepler @-@ 9b and Kepler @-@ 9c , but follow @-@ up studies had to be completed to verify that it was indeed a planet , and that the apparent transit event was not due to a background eclipsing binary star in the aperture of Kepler 's photometer . Kepler 's team exhaustively disproved that the small transit event could have been anything but a planet , and their results were published in the Astrophysical Journal on January 1 , 2011 . Follow @-@ up observations were conducted by the High Resolution Echelle Spectrometer at the W.M. Keck Observatory in Hawaii , as well as the WIYN Observatory in Arizona and the Palomar Observatory in California .

= = Host star = =

Kepler @-@ 9 is a sunlike star in the constellation Lyra that lies some 650 parsecs away from Earth . With a mass of 1 @.@ 07 M ? and a radius of 1 @.@ 02 R ? , Kepler @-@ 9 is almost exactly the same size and width of the Sun , being only 7 % more massive and 2 % wider . Kepler @-@ 9 has an effective temperature of 5777 (± 61) K , as compared to the Sun 's at 5778 K , and is approximately 32 % more metal @-@ rich (in terms of iron) than the Sun . Kepler @-@ 9 is younger than the Sun , and is estimated to be one billion years old . Kepler @-@ 9 has two planets other than Kepler @-@ 9d : the gas giants Kepler @-@ 9b and Kepler @-@ 9c .

= = Characteristics = =

Based on the size of its light curve , Kepler @-@ 9d is assumed to be a Super @-@ Earth , although its exact mass is not known . It is presumed to be at least 1 @.@ 5 Earth masses . The planet 's radius is inferred to be 1 @.@ 64 RE , or approximately 64 % larger than Earth 's radius . With an equilibrium temperature of 2026 K , it is hotter than all the previous planets discovered by Kepler (not counting the three previously discovered ones located in its field of view) . Its density is not known . With an average distance of .0273 AU (2 @,@ 537 @,@ 695 @.@ 73 miles) from its star , which it orbits every 1 @.@ 592851 days , Kepler @-@ 9d is the closest planet to its star in the Kepler @-@ 9 system . To compare , the planet Mercury is .3871 AU away from the Sun , which it orbits every 87 @.@ 97 days .