

= Kepler @-@ 4 =

Kepler @-@ 4 is a sunlike star located about 1631 light @-@ years away in the constellation Draco . It is in the field of view of the Kepler Mission , a NASA operation purposed with finding Earth @-@ like planets . Kepler @-@ 4b , a Neptune @-@ sized planet that orbits extremely close to its star , was discovered in its orbit and made public by the Kepler team on January 4 , 2010 . Kepler @-@ 4b was the first discovery by the Kepler satellite , and its confirmation helped to demonstrate the spacecraft 's effectiveness .

= = Nomenclature and history = =

Kepler @-@ 4 is named for the Kepler spacecraft , a NASA telescope tasked with finding Earth @-@ like planets that transit their stars as seen from Earth . As the previous three planets that Kepler confirmed had already been confirmed by other finds , Kepler @-@ 4 and its planet were the first to be discovered by the Kepler team . The star and its system were announced in Washington , D.C. at the 215th meeting of the American Astronomical Society on January 4 , 2010 , along with Kepler @-@ 5 , Kepler @-@ 6 , Kepler @-@ 7 , and Kepler @-@ 8 . Of the presented planets , Kepler @-@ 4b was the smallest , around the size of planet Neptune . The discovery of Kepler @-@ 4b and the other planets presented at the AAS meeting helped to confirm that the Kepler spacecraft was indeed functional .

The Harlan J. Smith Telescope at McDonald Observatory in Fort Davis , Texas was used by astronomers from the University of Texas at Austin to follow up on Kepler 's discoveries and confirm them . Telescopes in Hawaii , California , Arizona , and the Canary Islands were also used to confirm the findings .

= = Characteristics = =

Kepler @-@ 4 is a G0 @-@ type star , which is similar to the Sun , except slightly brighter . The star is 1 @. @ 092 Msun and 1 @. @ 533 Rsun , or 109 % the mass of and 153 % the radius of the Sun . With a metallicity of .17 (± 0 @. @ 06) [Fe / H] , Kepler @-@ 4 is more metal @-@ rich than the Sun by 48 % , a figure that is important in that metal @-@ rich stars tend to have orbiting planets more often than metal @-@ poor stars . Kepler @-@ 4 is also 4 @. @ 5 (± 1 @. @ 5) billion years old . In comparison , the Sun is 4 @. @ 6 billion years old . In addition , Kepler @-@ 4 has an effective temperature of 5781 (± 76) K , which is almost identical , within the errors , to that of the Sun , which is 5778 K.

As seen from Earth , Kepler @-@ 4 has an apparent magnitude of 12 @. @ 7 . It is , as a result , not visible with the naked eye .

= = Planetary system = =

Kepler @-@ 4b 's discovery was announced on January 4 , 2010 . It is the size of planet Neptune , at 0 @. @ 077 MJ (7 % the mass of Jupiter) and 0 @. @ 357 RJ (36 % the radius of Jupiter) . The planet orbits its star every 3 @. @ 214 days at 0 @. @ 045 AU from the star . This distance compares to planet Mercury , which is 0 @. @ 39 AU from the Sun . Kepler @-@ 4 's eccentricity was assumed to be 0 , however a subsequent independent reanalysis of the discovery data found a value of 0 @. @ 25 \pm 0 @. @ 12 . Likewise , the temperature of the planet is assumed to be 1650 K , far hotter than Jupiter 's , which is assumed to be 124 K (not considering its internal heat and atmosphere) .