

= Kepler @-@ 7 =

Kepler @-@ 7 is a star located in the constellation Lyra in the field of view of the Kepler Mission , a NASA operation in search of Earth @-@ like planets . It is home to the fourth of the first five planets that Kepler discovered ; this planet , a Jupiter @-@ size gas giant named Kepler @-@ 7b , is as light as styrofoam . The star itself is more massive than the Sun , and is nearly twice the Sun 's radius . It is also slightly metal @-@ rich , a major factor in the formation of planetary systems . Kepler @-@ 7 's planet was presented on January 4 , 2010 at a meeting of the American Astronomical Society .

= = Nomenclature and discovery = =

Kepler @-@ 7 received its name because it was the home to the seventh planetary system discovered by the NASA @-@ led Kepler Mission , a project aimed at detecting terrestrial planets that transit , or pass in front of , their host stars as seen from Earth . The planet orbiting Kepler @-@ 7 was the fourth planet to be discovered by the Kepler spacecraft ; the first three planets combed from Kepler 's data had been previously discovered , and were used to verify the accuracy of Kepler 's measurements . Kepler @-@ 7b was announced to the public on January 4 , 2010 at the 215th meeting of the American Astronomical Society in Washington , D.C. along with Kepler @-@ 4b , Kepler @-@ 5b , Kepler @-@ 6b , and Kepler @-@ 8b . Kepler @-@ 7b was noted for its unusually and extremely low density .

The planet 's initial discovery by Kepler was verified by additional observations made at observatories in Hawaii , Texas , Arizona , California , and the Canary Islands .

= = Characteristics = =

Kepler @-@ 7 is a sunlike star that is 1 @. @ 347 Msun and 1 @. @ 843 Rsun . This means that the star is about 35 % more massive and 84 % wider than the Sun . The star is estimated to be 3 @. @ 5 (± 1) billion years old . It is also estimated to have a metallicity of [Fe / H] = 0 @. @ 11 (± 0 @. @ 03) , meaning that Kepler @-@ 7 is approximately 30 % more metal @-@ rich than the Sun ; metallicity plays a significant role in the formation of planetary systems , as metal @-@ rich stars tend to be more likely to have planets in orbit . The star 's effective temperature is 5933 (± 44) K. In comparison , the 4 @. @ 6 billion @-@ year @-@ old Sun releases less heat , with an effective temperature of 5778 K.

The star has an apparent magnitude of 13 @. @ 3 , meaning that it is extremely dim as seen from Earth . It cannot be seen with the naked eye . It is estimated to lie between 1000 and 1400 light years from the Solar System .

= = Planetary system = =

Kepler @-@ 7b is the only planet that has been discovered in Kepler @-@ 7 's orbit . It is .433 MJ and 1 @. @ 478 RJ , meaning it is 43 % the mass of planet Jupiter , but is nearly three halves its size . With a density of .166 grams / cc , the planet is approximately 17 % the density of water . This is comparable to styrofoam . At a distance of .06224 AU from its host star , Kepler @-@ 7b completes an orbit around Kepler @-@ 7 every 4 @. @ 8855 days . Planet Mercury , however , orbits the Sun at .3871 AU , and takes approximately 87 @. @ 97 days to complete one orbit . Kepler @-@ 7b 's eccentricity is assumed to be 0 , which would give Kepler @-@ 7b a circular orbit by definition .