

KELT-3b CASE FILE



KELT-3b

Known as **KELT-3b**, the third exoplanet found by the KELT survey, this exoplanet is unlike anything we have seen in our Solar System.

Cheops observed this mysterious exoplanet on the **22 January 2023 at 23:20 CET**. By analysing the data, we have discovered that KELT-3b is...

a gas giant. This exoplanet orbits an F type star. KELT-3b is an exoplanet that orbits the star KELT-3, which is located approximately 686.6 light-years (210.5 pc) from our Solar System. Its discovery was made public in 2012. KELT-3 has an apparent magnitude of 9.8 and an absolute magnitude of 3.2. It is 1.3 times more massive and 1.5 times larger than the Sun. The surface temperature is 6304 degrees Fahrenheit, with F spectral types. The extrasolar planet KELT-3 b orbits the star KELT-3 every 2.7 days and has an orbital distance of 0.04 AU (6158944.3 km).

In comparison to the planets in the Solar System, KELT-3b...

is massive. It's mass is about 1.94 Jupiters. The entire exoplanet is larger than the sun by 1.3x the size. It has a temperature of 1,811 K, which gives it a Hot Jupiter class. KELT-3b has a lower density than Jupiter, and completes a revolution in less than 3 days. Since Jupiter is the largest planet in our solar system and is considered a gas giant, KELT-3b is described as a hot Jupiter, therefore a conclusion can be made that KELT-3b is a puffy gas giant which is noted as a hot Jupiter.

Fast Facts:

TYPE	Hot Jupiter
RADIUS OF THE PLANET	1.333 R _J
MASS OF THE PLANET	1.94 ± 0.08 M _{JUPITER}
ORBITAL PERIOD	0.0074 years
DISTANCE TO HOST STAR	686.6 light years
DENSITY	0.75-0.12-0.10 g cm ⁻³
DISCOVERED	2012 by the KELT survey
CHARACTERISTICS	puffy and gaseous
COMPOSITION	Puffy
TEMPERATURE	1843 ⁰⁰ ₀₀ °C

KELT-3 is a sun like star 690 light years away from Earth in the Leo constellation. KELT-3 is slightly bigger than our Sun.

Mass of the star = $1.96 \pm 0.50 M_{\text{sun}}$

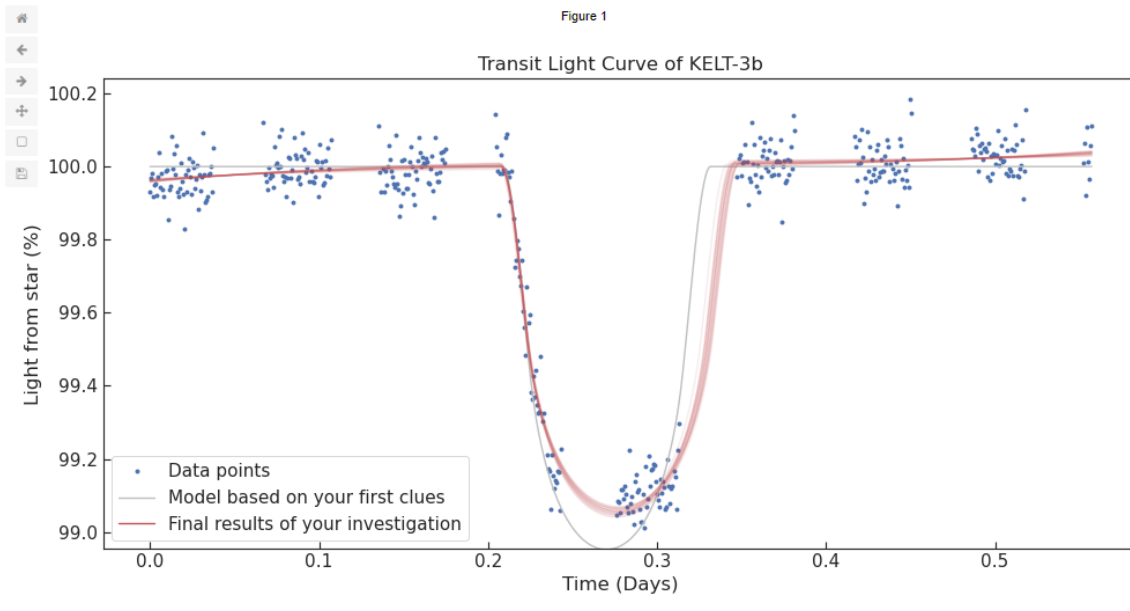
Radius of the star = $1.70 \pm 0.12 R_{\text{sun}}$

KELT-3b: Data and Light Curve

Light curve

Histograms

Table



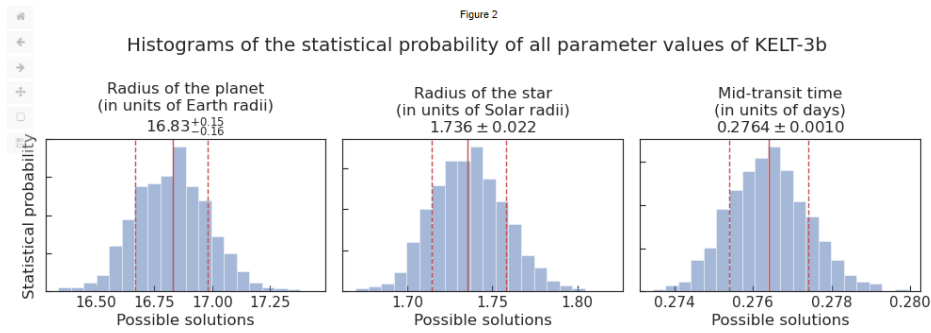
Download the light curve figure here:

Transit Light Curve of KELT-3b

Light curve

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The histograms show the probability of each parameter having a certain value.

The central, solid line shows the median value of each parameter.

The dashed lines to the left and right of it indicate the lower and upper bounds, respectively.

These are called the 1-sigma uncertainties. That means, statistically we can be 68% sure that the true value lies within them.

Note that this means it is possible that the true value of a parameter lies outside of these bounds;

they are only statistical uncertainties, not definite limits.

Download the histogram figure here:

[results/KELT-3b/histograms.pdf](#)

Histograms of KELT-3b

Light curve		Histograms		Table		
Name	Median value	Lower error	Upper error	Case note	Target	
Radius of the planet (in units of Earth radii)	16.83	0.16	0.15	Cheops observations	KELT-3b	
Radius of the star (in units of Solar radii)	1.736	0.021	0.022	Cheops observations	KELT-3b	
Mid-transit time (in units of days)	0.2764	0.0010	0.0010	Cheops observations	KELT-3b	
Orbital period (in units of days)	2.70339			Other observations from the archive	KELT-3b	
Orbital semi-major axis (in units of AU)	0.0464			Other observations from the archive	KELT-3b	

Download the table here:
<results/KELT-3b/table.txt>

Table of KELT-3b