

RULES OF THE GAME

- 1) Shuffle the deck and divide the cards evenly between all the players.
- 2) Hold your own cards face-up in a stack so only the top one is visible.
- 3) The youngest person begins by reading out a category such as Distance or Temperature, and each player has to say the value number of the chosen category.
- 4) Then, based on the category, the person with the highest or the oldest number rating in the chosen category wins the other players' cards and puts them at the back of his pile. The winner of that round chooses the next category, which MUST be different from the last round (even if you are the winner).



For Mass, Distance, Period, and Temperature, the player with the highest value wins. For the Discovery Date, the player with the oldest date wins, and for the Size Comparison, the person with the biggest planet wins.



Jupiter
Exoplanet

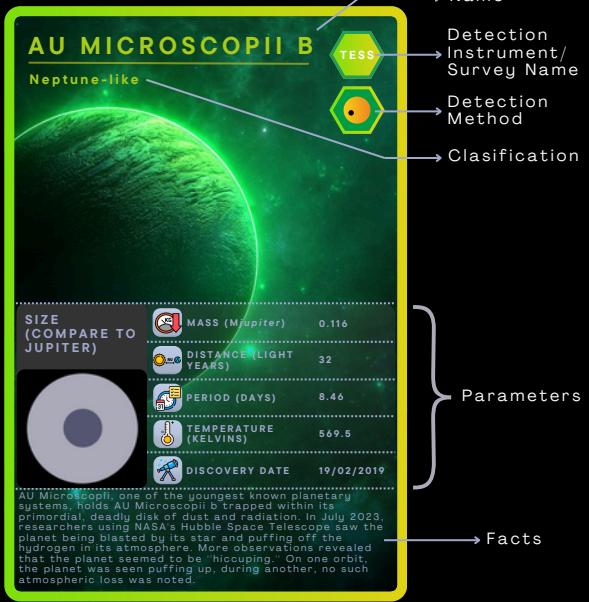
- 4) If two players have the same stats, or if one value is n/a, everyone stacks their cards face up in the center of the playing area. At this point, start a new round with the last winning player sharing their highest stat with the other players. The new winner from this round will add the losing cards to their own hand, as well as the cards from the center of the play area.
- 5) If you only have two cards left, you can choose which one you want to use.
- 6) Continue until one of the players loses all of their cards.

Credit: Pauline Lomba

DETECTION INSTRUMENT/SURVEY NAME ABBREVIATIONS

- TESS : Transiting Exoplanet Survey Satellite
TrES : Trans-Atlantic Exoplanet Survey
H-P : Haute-Provence Observatory
SWASP : Super Wide Angle Search for Planets
Subaru : Subaru Telescope
McDonald : McDonald Observatory
VLT : Very Large Telescope
KELT-N : Kilodegree Extremely Little Telescope - North
WASP : Wide Angle Search for Planets
HST : Hubble Space Telescope
Arecibo : Arecibo Observatory
ESO : European Southern Observatory
Paranal : Paranal Observatory (part of ESO)
W.M.Keck : William Myron Keck Observatory
SST : Spitzer Space Telescope
La Silla : La Silla Observatory (part of ESO)
OGLE : Optical Gravitational Lensing Experiment

CARD EXPLANATION



DETECTION METHOD SYMBOLS



Credit: Pauline Lomba

AU MICROSCOPII B

Neptune-like



SIZE (COMPARE TO JUPITER)



MASS (Mjupiter)	0.116
DISTANCE (LIGHT YEARS)	32
PERIOD (DAYS)	8.46
TEMPERATURE (KELVINS)	569.5
DISCOVERY DATE	19/02/2019

AU Microscopii, one of the youngest known planetary systems, holds AU Microscopii b trapped within its primordial, deadly disk of dust and radiation. In July 2023, researchers using NASA's Hubble Space Telescope saw the planet being blasted by its star and puffing off the hydrogen in its atmosphere. More observations revealed that the planet seemed to be "hiccuping." On one orbit, the planet was seen puffing up, during another, no such atmospheric loss was noted.

Credit: Pauline Lomba

TRES-2B

Gas Giant



SIZE (COMPARE TO JUPITER)



MASS (Mjupiter)	1.49
DISTANCE (LIGHT YEARS)	703
PERIOD (DAYS)	2.47
TEMPERATURE (KELVINS)	1885
DISCOVERY DATE	21/08/2006

Are you afraid of the dark? Welcome to TrEs-2b, the darkest planet ever discovered. This planet reflects less than 1% of the light that touches its surface, making it less reflective than coal. The air on this planet is as hot as lava due to its proximity to its parent star and the absence of reflective clouds. Finally, if you were on the surface of this planet, models predict that you'd see an eerie deep red glow emanating from its burning atmosphere.

Credit: Pauline Lomba

HD 189733B

Gas Giant



SIZE (COMPARE TO JUPITER)



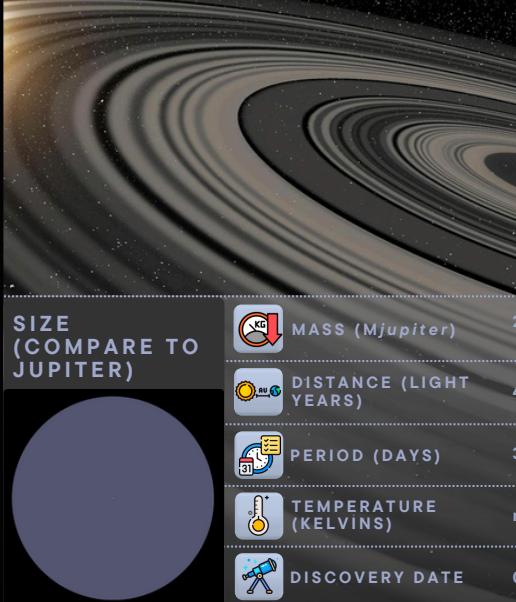
MASS (Mjupiter)	1.13
DISTANCE (LIGHT YEARS)	63
PERIOD (DAYS)	2.2
TEMPERATURE (KELVINS)	919
DISCOVERY DATE	05/10/2005

This distant planet may appear bright blue, but any traveler mistaking it for Earth's friendly skies would be gravely mistaken. Its weather is deadly, with winds reaching up to 2 km/s, eighteen times the speed of the most powerful tornado on Earth, creating a terrifying spiral around the planet. Rain on this world is lethal, as it possibly rains glass sideways in its fierce winds. The cobalt blue color doesn't come from a tropical ocean like on Earth, but from a hazy atmosphere filled with high clouds containing silicate particles that scatter blue light more than red light.

Credit: Pauline Lomba

J1407B

Gas Giant



SIZE (COMPARE TO JUPITER)



MASS (Mjupiter)	20
DISTANCE (LIGHT YEARS)	433
PERIOD (DAYS)	3725
TEMPERATURE (KELVINS)	n/a
DISCOVERY DATE	05/2007

J1407b is the first exoplanet discovered with a ring system. During its transit across its host star, it obstructs 95% of its star's light. Usually, this effect is tiny; even a planet the size of Jupiter may block just 1% of its star's light. In 2007, the star's light exhibited rapid fluctuations over two months: fading, brightening, fading again for a week, and then reversing the pattern. The most plausible explanation for this phenomenon is the passage of an extensive ring system between the star and Earth, equivalent in size to the orbit of Venus, covering 40,000 times the area of Saturn's rings.

Credit: Pauline Lomba

KEPLER-22 B

Super Earth



SIZE
(COMPARE TO
JUPITER)



	MASS (Mjupiter)	0.113
	DISTANCE (LIGHT YEARS)	625
	PERIOD (DAYS)	289.9
	TEMPERATURE (KELVINS)	262
	DISCOVERY DATE	16/06/2009

Kepler-22b, a super-Earth, possibly hosts a vast ocean covering its surface. Its true nature remains uncertain; with a radius 2.4 times that of Earth, it could potentially be gaseous. Due to its extreme tilt, like Uranus (90°), the planet's north and south poles would experience alternating periods of sunlight and darkness, each lasting half a year, as it orbits its star. However, theoretically, this world presents potential conditions for life.

Credit: Pauline Lomba

GJ 504B

Gas Giant



SIZE
(COMPARE TO
JUPITER)



	MASS (Mjupiter)	4
	DISTANCE (LIGHT YEARS)	57
	PERIOD (DAYS)	94928
	TEMPERATURE (KELVINS)	544
	DISCOVERY DATE	2013

If we could travel to this giant planet, we would see a world still glowing from the heat of its formation with a color reminiscent of a dark cherry blossom, a dull magenta. GJ 504b orbits its star at nearly nine times the distance Jupiter orbits the Sun, challenging theoretical ideas of giant planet formation. According to the core-accretion model, such planets form through collisions among asteroids and comets in the gas-rich debris disks around young stars. However, when the planet is too far from its host star, we still don't know if this model is accurate.

Credit: Pauline Lomba

WASP-12 B

Gas Giant



SIZE
(COMPARE TO
JUPITER)



	MASS (Mjupiter)	1.47
	DISTANCE (LIGHT YEARS)	1410
	PERIOD (DAYS)	1.1
	TEMPERATURE (KELVINS)	2593
	DISCOVERY DATE	11/10/2008

Almost twice the size of Jupiter, WASP-12b orbits so close to its parent star that it's being torn apart. The star's scorching heat is slowly stripping away and devouring the planet's atmosphere. Additionally, gravity causes enormous tidal forces, stretching the planet into the shape of an egg. In 10 million years, this alien world could be completely consumed. So, if you enjoy watching worlds fall to pieces, then this planet is for you.

Credit: Pauline Lomba

55 CANCRI E

Super Earth



SIZE
(COMPARE TO
JUPITER)



	MASS (Mjupiter)	0.02703
	DISTANCE (LIGHT YEARS)	40.25
	PERIOD (DAYS)	0.74
	TEMPERATURE (KELVINS)	2040
	DISCOVERY DATE	30/08/2004

55 Cancri e is a lava world; this means scientists believe it's covered in flowing lava seas due to its proximity to its star. The molten surface would render it completely uninhabitable. An interesting fact is that silicates in the atmosphere would condense into clouds on the tidally-locked planet's dark side, reflecting the lava below, making the skies sparkle.

Credit: Pauline Lomba

KEPLER-16B

Gas Giant



SIZE (COMPARE TO JUPITER)



MASS (Mjupiter) 0.333

DISTANCE (LIGHT YEARS) 245

PERIOD (DAYS) 228.8

TEMPERATURE (KELVINS) 324

DISCOVERY DATE 15/09/2011

Kepler-16b was the Kepler telescope's first discovery of a planet in a "circumbinary" orbit – circling two stars, as opposed to one star in a double-star system. Like Luke Skywalker's home planet Tatooine, Kepler-16b has two sunsets. This planet, however, is likely cold, about the size of Saturn and gaseous, though partly composed of rock. Its stars are cooler than our sun, probably rendering the planet lifeless.

Credit: Pauline Lomba

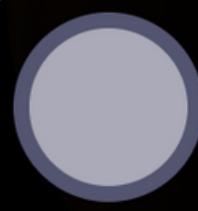


2M1207 B

Gas Giant



SIZE (COMPARE TO JUPITER)



MASS (Mjupiter) 5.5

DISTANCE (LIGHT YEARS) 230

PERIOD (DAYS) 620925

TEMPERATURE (KELVINS) 1300

DISCOVERY DATE 2004

This composite image depicts an exoplanet (the red spot on the upper right) in orbit around the brown dwarf 2M1207 (blue spot in the center). 2M1207 b holds the distinction of being the first exoplanet directly imaged and the first discovered orbiting a brown dwarf. It was imaged for the first time in 2004 by the Very Large Telescope (VLT), operated by the European Southern Observatory in the Atacama Desert of northern Chile.

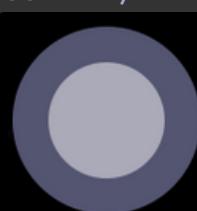
Credit: Pauline Lomba

KEPLER-7B

Gas Giant



SIZE (COMPARE TO JUPITER)



MASS (Mjupiter) 0.441

DISTANCE (LIGHT YEARS) 3090

PERIOD (DAYS) 4.9

TEMPERATURE (KELVINS) 1630

DISCOVERY DATE 01/04/2010

This giant planet has roughly the same density as Styrofoam, meaning that if you found a bathtub big enough, Kepler-7b could float. It orbits tidally locked, like the Moon; but here one side roasts by day, and the other is permanently plunged into darkness. Kepler-7b was also the first exoplanet to have its clouds mapped, revealing weather patterns that can conduct super-heated air from the roasting front of the planet to warm the side in endless freezing night.

Credit: Pauline Lomba

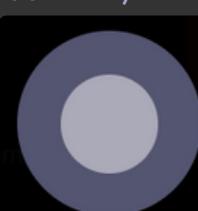


KELT-9 B

Gas Giant



SIZE (COMPARE TO JUPITER)



MASS (Mjupiter) 3.88

DISTANCE (LIGHT YEARS) 667

PERIOD (DAYS) 1.48

TEMPERATURE (KELVINS) 4600

DISCOVERY DATE 2016

This tidally-locked planet, hotter than most stars, is even too extreme for molecules to remain intact. Hydrogen gas molecules likely disintegrate on the dayside, only to reform once their atoms flow around to the planet's nightside. Despite being a gas giant 2.8 times larger than Jupiter, KELT-9b is only half as dense. Scientists anticipated a smaller radius for the planet, but the extreme radiation from its host star has caused its atmosphere to inflate like a balloon.

Credit: Pauline Lomba

KEPLER-452B

Super Earth



SIZE
(COMPARE TO JUPITER)



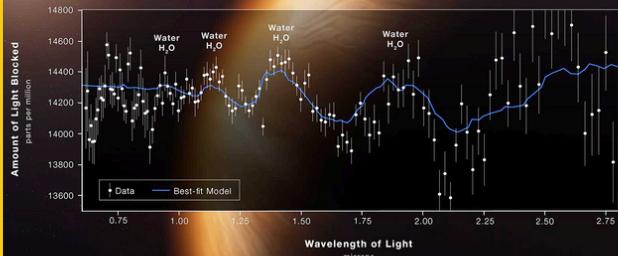
	MASS (Mjupiter)	0.01
	DISTANCE (LIGHT YEARS)	1828.5
	PERIOD (DAYS)	384.8
	TEMPERATURE (KELVINS)	265
	DISCOVERY DATE	23/07/2015

Kepler-452b is the first near-Earth-size world to be found in the habitable zone (the region around a star where temperatures are right for water to be liquid on the surface) of a star similar to our Sun. Until its discovery in 2015, the Kepler telescope had only detected 12 Earth-size planets (smaller than twice the size of Earth) in the habitable zone of their smaller and cooler stars. Kepler-452b is the first planet orbiting a star of about the same size and temperature as the Sun.

Credit: Pauline Lomba

WASP-96B

Gas Giant



SIZE
(COMPARE TO JUPITER)



	MASS (Mjupiter)	0.48
	DISTANCE (LIGHT YEARS)	1150
	PERIOD (DAYS)	3.42
	TEMPERATURE (KELVINS)	1286

This is the transmission spectrum of WASP-96 b, obtained from a single observation using the James Webb Space Telescope. This data reveals atmospheric characteristics; here, we can distinguish signatures of water, along with evidence of clouds and haze, in the atmosphere of this hot, puffy gas giant planet, which orbits a distant star. The observation is the most detailed of its kind to date, demonstrating Webb's unprecedented ability to analyze atmospheres hundreds of light-years away.

Credit: Pauline Lomba

KEPLER-11 B

Terrestrial



SIZE
(COMPARE TO JUPITER)



	MASS (Mjupiter)	0.006
	DISTANCE (LIGHT YEARS)	2148
	PERIOD (DAYS)	10.3
	TEMPERATURE (KELVINS)	900
	DISCOVERY DATE	02/02/2011

Kepler-11 is the fullest, most compact planetary system yet discovered beyond our own. This system is composed of six planets made of a mix of rock and gases orbiting a yellow dwarf star. If placed inside our solar system, Kepler-11g (the last one) would orbit between Mercury and Venus, and the other five planets would orbit between Mercury and our Sun. The innermost planet, Kepler-11b, is 10 times closer to its star than Earth is to the Sun. All six planets are larger than Earth, with the largest comparable in size to Uranus and Neptune.

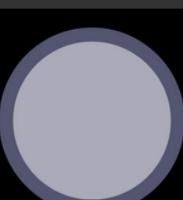
Credit: Pauline Lomba

PSR B1620-26 B

Gas Giant



SIZE
(COMPARE TO JUPITER)



	MASS (Mjupiter)	2.5
	DISTANCE (LIGHT YEARS)	12393
	PERIOD (DAYS)	36525
	TEMPERATURE (KELVINS)	72
	DISCOVERY DATE	30/06/1993

This exoplanet bears the unofficial nicknames "Methuselah" and "the Genesis planet" (named after the Biblical character Methuselah, who, according to the Bible, is the oldest person ever to have lived) due to its extreme age, believed to be about 12.7 billion years old. The planet is also the first circumbinary planet ever confirmed, orbiting around a pulsar (PSR B1620-26 A) and a white dwarf (WD B1620-26), and it's the first planet found in a globular cluster.

Credit: Pauline Lomba

51 PEGASI B

Gas Giant



SIZE
(COMPARE TO
JUPITER)



MASS (Mjupiter)

0.47



DISTANCE (LIGHT
YEARS)

60



PERIOD (DAYS)

4.23



TEMPERATURE
(KELVINS)

1284



DISCOVERY DATE

06/10/1995

51 Pegasi b is the first exoplanet discovered orbiting a star by Michel Mayor and Didier Queloz at the Observatoire de Haute-Provence in France. For this discovery, they won the Nobel Prize in Physics in 2019. It marked a breakthrough in astronomical research, launching a new field in astronomical research. In 2017, traces of water were discovered in the planet's atmosphere.

Credit: Pauline Lomba

PSR B1257+12 B

Terrestrial



SIZE
(COMPARE TO
JUPITER)



MASS (Mjupiter)

0.013



DISTANCE (LIGHT
YEARS)

2315.71



PERIOD (DAYS)

66.5



TEMPERATURE
(KELVINS)

169



DISCOVERY DATE

22/01/1992

This planet, orbiting the dead star PSR B1257+12, known as a pulsar, is the first extrasolar planet to be discovered, identified in 1992 by Dale Frail and Aleksander Wolszczan. Pulsars are extremely precise clocks, and even small planets can create detectable variations in pulsar traits. This planet, also named Poltergeist, and its neighboring worlds, Phobetor and Draugr, are constantly bombarded with radiation from the star's core. Nothing but the undead can subsist in this most inhospitable corner of the galaxy.

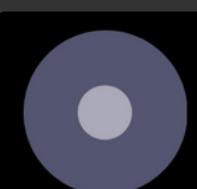
Credit: Pauline Lomba

TYC 8998-760-1 B

Gas Giant



SIZE
(COMPARE TO
JUPITER)



MASS (Mjupiter)

14



DISTANCE (LIGHT
YEARS)

308.54



PERIOD (DAYS)

753547



TEMPERATURE
(KELVINS)

1727



DISCOVERY DATE

20/07/2020

TYC 8998-760-1 b and its companion planet orbit a very young star, only about 17 million years old, a baby among stars. That means the star's planets formed only recently and are still so hot that they give off a powerful glow detectable by ground-based telescopes. TYC 8998-760-1b might be a brown dwarf – a kind of ‘failed star’ – that is considered neither a star nor a planet, but somewhere in between. Brown dwarfs are mysterious worlds, with many unanswered questions about their properties and appearance. They're too massive to be planets, but not quite massive enough to be stars.

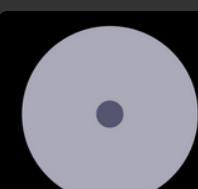
Credit: Pauline Lomba

TOI-1452 B

Super Earth



SIZE
(COMPARE TO
JUPITER)



MASS (Mjupiter)

0.01517



DISTANCE (LIGHT
YEARS)

99.49



PERIOD (DAYS)

11.062



TEMPERATURE
(KELVINS)

326



DISCOVERY DATE

06/2022

TOI-1452 b is a confirmed super-Earth exoplanet, possibly a water world. It is located at a distance from its star where its temperature would neither be too hot nor too cold. Astronomers believe it to be an ‘ocean planet’, which means a planet covered with a thick layer of water.

Credit: Pauline Lomba

GJ 436 B

Neptune-like



SIZE
(COMPARE TO
JUPITER)



	MASS (Mjupiter)	0.07
	DISTANCE (LIGHT YEARS)	33.27
	PERIOD (DAYS)	2.64
	TEMPERATURE (KELVINS)	800
	DISCOVERY DATE	31/08/2004

This planet is unique for its lack of methane, which is commonly found in other planets in our solar system. Models predicted methane due to its composition and temperature, but observations from Spitzer showed none. The planet is too compact to be made mostly of hydrogen gas, like Jupiter, but may not be compact enough to be a rocky super-Earth. Researchers think it may be made mostly of an exotic form of water, an "ice" hardened by pressure rather than temperature.

Credit: Pauline Lomba

LP 791-18 D

Super Earth



SIZE
(COMPARE TO
JUPITER)



	MASS (Mjupiter)	0.02703
	DISTANCE (LIGHT YEARS)	86
	PERIOD (DAYS)	2.8
	TEMPERATURE (KELVINS)	650
	DISCOVERY DATE	04/2023

This planet could undergo volcanic outbursts as often as Jupiter's moon Io, the most volcanically active body in our solar system. During each orbit, planets D and C pass very close to each other. Planet C, being more massive, produces a gravitational tug on planet D, making its orbit somewhat elliptical, deforming planet D every time it goes around the star. These deformations can create enough internal friction to substantially heat the planet's interior and produce volcanic activity at its surface. Moreover, temperatures could drop enough on the planet's night side for water to condense on the surface.

Credit: Pauline Lomba

KEPLER-37B

Terrestrial



SIZE
(COMPARE TO
JUPITER)



	MASS (Mjupiter)	0.00248
	DISTANCE (LIGHT YEARS)	209
	PERIOD (DAYS)	13.4
	TEMPERATURE (KELVINS)	718
	DISCOVERY DATE	20/02/2013

Kepler-37b is the smallest planet discovered around a main-sequence star, with a radius slightly greater than that of the Moon and slightly smaller than that of Mercury. Because of its small size, it is not expected to have an atmosphere, and it is very likely that it is a rocky planet with a solid surface. Furthermore, it is too hot to support liquid water on its surface.

Credit: Pauline Lomba

TRAPPIST-1 E

Terrestrial



SIZE
(COMPARE TO
JUPITER)



	MASS (Mjupiter)	0.002
	DISTANCE (LIGHT YEARS)	40.7
	PERIOD (DAYS)	6.1
	TEMPERATURE (KELVINS)	251.3
	DISCOVERY DATE	22/02/2017

Trappist-1 system is the most studied planetary system, aside from our own solar system. It is composed of seven rocky exoplanets, all of them with the potential for water on their surfaces. Trappist-1e is the only one that has a rock-iron composition like Earth, with a compact hydrogen-poor atmosphere, which is good because hydrogen is a really strong greenhouse gas, meaning there could be liquid water on its surface. All of this gives it an Earth Similarity Index of 0.95, which makes it one of the most Earth-like planets found so far.

Credit: Pauline Lomba

PROXIMA CENTAURI B

Super Earth

ESO



SIZE
(COMPARE TO
JUPITER)



MASS (Mjupiter) 0.00337

DISTANCE (LIGHT YEARS) 4.243

PERIOD (DAYS) 11.18

TEMPERATURE (KELVINS) 216

DISCOVERY DATE 24/08/2016

Proxima Centauri b is our closest known exoplanet neighbor. It orbits in the habitable zone of its star, but its star releases extreme ultraviolet radiation hundreds of times greater than our Sun, generating enough energy to strip away any atmosphere. Water is not the only condition for life; having the right atmosphere is also essential. It allows for climate regulation, the maintenance of a water-friendly surface pressure, shielding from hazardous space weather, and the housing of life's chemical building blocks.

Credit: Pauline Lomba

K2-18 B

Super Earth

K2



SIZE
(COMPARE TO
JUPITER)



MASS (Mjupiter) 0.028

DISTANCE (LIGHT YEARS) 124

PERIOD (DAYS) 32.9

TEMPERATURE (KELVINS) 284

DISCOVERY DATE 2015

K2-18 b is classified as a 'sub-Neptune' planet, situated in size between Earth and Neptune. This class is prevalent in our galaxy but has no analog in our solar system. K2-18 b occupies the habitable zone of its star and recent observations have revealed an abundance of methane and carbon dioxide, along with a shortage of ammonia, suggesting the presence of a water ocean beneath a hydrogen-rich atmosphere. Initial observations have also provided a possible detection of a molecule called dimethyl sulfide (DMS), typically associated with life on Earth, emitted by phytoplankton in marine environments.

Credit: Pauline Lomba

TRAPPIST-1 B

Super Earth

LA SILLA



SIZE
(COMPARE TO
JUPITER)



MASS (Mjupiter) 0.0027

DISTANCE (LIGHT YEARS) 40.7

PERIOD (DAYS) 1.51

TEMPERATURE (KELVINS) 503

DISCOVERY DATE 02/05/2016

Trappist-1 b, named after two Belgian people and referring to the traditional Belgian Trappist beer, is a tidally locked planet. This means that one side of the planet always faces its star, leading to permanent day on that side and permanent night on the other side. In this configuration, the terminator zone would likely be the only place on the planet potentially hospitable. This is the zone that is bathed in constant twilight at the limit of the eternal day or night.

Credit: Pauline Lomba

WASP-39 B

Gas Giant

WASP



SIZE
(COMPARE TO
JUPITER)



MASS (Mjupiter) 0.28

DISTANCE (LIGHT YEARS) 700

PERIOD (DAYS) 4.055

TEMPERATURE (KELVINS) 1873.15

DISCOVERY DATE 02/2011

In July 2022, WASP-39 b made history as the first exoplanet studied by NASA's James Webb Space Telescope (JWST). It also provided the first clear evidence of carbon dioxide in the atmosphere of a planet beyond our solar system, and later, it marked the first observation of sulfur dioxide and photochemistry (chemical changes influenced by starlight) in an exoplanet atmosphere. This pioneering observation of WASP-39 b offered crucial insights into the composition and formation of planets.

Credit: Pauline Lomba

OGLE-2016-BLG-1928

Gas Giant



SIZE
(COMPARE TO
JUPITER)



MASS (Mjupiter) 0.0009

DISTANCE (LIGHT
YEARS) 12753

PERIOD (DAYS) n/a

TEMPERATURE
(KELVINS) n/a

DISCOVERY DATE 2020

OGLE-2016-BLG-1928 is a rogue terrestrial-mass extrasolar planet, meaning it's an interstellar object of planetary mass not gravitationally bound to any star or brown dwarf. Rogue planets can originate from planetary systems where they were formed and later ejected, or they may form independently outside of any planetary system. Another possibility is that they are failed small brown dwarfs, which are stars that failed to form due to the presence of a supermassive star nearby, preventing their formation into real stars and casting them away.

Credit: Pauline Lomba

KEPLER-51 B

Neptune-like



SIZE
(COMPARE TO
JUPITER)



MASS (Mjupiter) 0.0066

DISTANCE (LIGHT
YEARS) 2620

PERIOD (DAYS) 45.154

TEMPERATURE
(KELVINS) 543

DISCOVERY DATE 2012

Kepler-51 b is what we call a super-puff. This is a type of exoplanet with a mass only a few times larger than Earth's but with a radius larger than that of Neptune, giving it a very low mean density. The most extreme examples known are the three planets around Kepler-51, all Jupiter-sized but with densities below 0.1 g/cm^3 . Despite this classification, the model predicts that super-puffs should not exist, as they are expected to lose their atmosphere relatively quickly.

Credit: Pauline Lomba



