Exoplanets

Exoplanet

orbital times for exoplanets vary from less than an hour (for those closest to their star) to thousands of years. Some exoplanets are so far away from

An exoplanet or extrasolar planet is a planet outside of the Solar System. The first confirmed detection of an exoplanet was in 1992 around a pulsar, and the first detection around a main-sequence star was in 1995. A different planet, first detected in 1988, was confirmed in 2003. In 2016, it was recognized that the first possible evidence of an exoplanet had been noted in 1917. As of 14 August 2025, there are 5,983 confirmed exoplanets in 4,470 planetary systems, with 1,001 systems having more than one planet. In collaboration with ground-based and other space-based observatories the James Webb Space Telescope (JWST) is expected to give more insight into exoplanet traits, such as their composition, environmental conditions, and planetary habitability.

There are many methods of detecting exoplanets. Transit photometry and Doppler spectroscopy have found the most, but these methods suffer from a clear observational bias favoring the detection of planets near the star; thus, 85% of the exoplanets detected are inside the tidal locking zone. In several cases, multiple planets have been observed around a star. About 1 in 5 Sun-like stars are estimated to have an "Earth-sized" planet in the habitable zone. Assuming there are 200 billion stars in the Milky Way, it can be hypothesized that there are 11 billion potentially habitable Earth-sized planets in the Milky Way, rising to 40 billion if planets orbiting the numerous red dwarfs are included.

The least massive exoplanet known is Draugr (also known as PSR B1257+12 A or PSR B1257+12 b), which is about twice the mass of the Moon. The most massive exoplanet listed on the NASA Exoplanet Archive is HR 2562 b, about 30 times the mass of Jupiter. However, according to some definitions of a planet (based on the nuclear fusion of deuterium), it is too massive to be a planet and might be a brown dwarf. Known orbital times for exoplanets vary from less than an hour (for those closest to their star) to thousands of years. Some exoplanets are so far away from the star that it is difficult to tell whether they are gravitationally bound to it.

Almost all planets detected so far are within the Milky Way. However, there is evidence that extragalactic planets, exoplanets located in other galaxies, may exist. The nearest exoplanets are located 4.2 light-years (1.3 parsecs) from Earth and orbit Proxima Centauri, the closest star to the Sun.

The discovery of exoplanets has intensified interest in the search for extraterrestrial life. There is special interest in planets that orbit in a star's habitable zone (sometimes called "goldilocks zone"), where it is possible for liquid water, a prerequisite for life as we know it, to exist on the surface. However, the study of planetary habitability also considers a wide range of other factors in determining the suitability of a planet for hosting life.

Rogue planets are those that are not in planetary systems. Such objects are generally considered in a separate category from planets, especially if they are gas giants, often counted as sub-brown dwarfs. The rogue planets in the Milky Way possibly number in the billions or more.

Lists of planets

imaged exoplanets List of exoplanet extremes List of exoplanet firsts List of exoplanets discovered by the Kepler space telescope List of exoplanets observed

These are lists of planets. A planet is a large, rounded astronomical body that is neither a star nor its remnant. The best available theory of planet formation is the nebular hypothesis, which posits that an interstellar cloud collapses out of a nebula to create a young protostar orbited by a protoplanetary disk. There are eight planets within the Solar System; planets outside of the solar system are also known as exoplanets.

As of 14 August 2025, there are 5,983 confirmed exoplanets in 4,470 planetary systems, with 1,001 systems having more than one planet. Most of these were discovered by the Kepler space telescope. There are an additional 1,979 potential exoplanets from Kepler's first mission yet to be confirmed, as well as 976 from its "Second Light" mission and 4,687 from the Transiting Exoplanet Survey Satellite (TESS) mission.

List of potentially habitable exoplanets

exoplanets discovered so far. It is mostly based on estimates of habitability by the Habitable Worlds Catalog (HWC), and data from the NASA Exoplanet

The following list includes some of the potentially habitable exoplanets discovered so far. It is mostly based on estimates of habitability by the Habitable Worlds Catalog (HWC), and data from the NASA Exoplanet Archive. The HWC is maintained by the Planetary Habitability Laboratory at the University of Puerto Rico at Arecibo.

Surface planetary habitability is thought to require an orbit at the right distance from the host star for liquid surface water to be present, in addition to various geophysical and geodynamical aspects, atmospheric density, radiation type and intensity, and the host star's plasma environment.

List of largest exoplanets

list is designed to include all exoplanets that are larger than 1.6 times the size of Jupiter. Some well-known exoplanets that are smaller than 1.6 RJ (17

Below is a list of the largest exoplanets so far discovered, in terms of physical size, ordered by radius.

List of exoplanets discovered in 2025

information. Lists of exoplanets List of directly imaged exoplanets List of exoplanet extremes List of exoplanet firsts List of exoplanets discovered by the

This list of exoplanets discovered in 2025 is a list of confirmed exoplanets that were first reported in 2025.

For exoplanets detected only by radial velocity, the listed value for mass is a lower limit. See Minimum mass for more information.

List of nearest exoplanets

Within 10 parsecs (32.6 light-years), there are 106 exoplanets listed as confirmed by the NASA Exoplanet Archive. Among the over 500 known stars and brown

There are 6,032 known exoplanets, or planets outside the Solar System that orbit a star, as of July 29, 2025; only a small fraction of these are located in the vicinity of the Solar System. Within 10 parsecs (32.6 light-years), there are 106 exoplanets listed as confirmed by the NASA Exoplanet Archive. Among the over 500 known stars and brown dwarfs within 10 parsecs, around 60 have been confirmed to have planetary systems; 51 stars in this range are visible to the naked eye, eight of which have planetary systems.

The first report of an exoplanet within this range was in 1998 for a planet orbiting around Gliese 876 (15.3 light-years (ly) away), and the latest as of 2025 is a system around Barnard's Star (6.0 ly). The closest exoplanets are those found orbiting the star closest to the Solar System, which is Proxima Centauri 4.25 light-

years away. The first confirmed exoplanet discovered in the Proxima Centauri system was Proxima Centauri b, in 2016. HD 219134 (21.6 ly) has six exoplanets, the highest number discovered for any star within this range.

Most known nearby exoplanets orbit close to their stars. A majority are significantly larger than Earth, but a few have similar masses, including planets around YZ Ceti, Gliese 367, Proxima Centauri, and Barnard's Star which may be less massive than Earth. Several confirmed exoplanets are hypothesized to be potentially habitable, with Proxima Centauri b and GJ 1002 b (15.8 ly) considered among the most likely candidates. The International Astronomical Union has assigned proper names to some known extrasolar bodies, including nearby exoplanets, through the NameExoWorlds project. Planets named in the 2015 event include the planets around Epsilon Eridani (10.5 ly) and Fomalhaut, while planets named in the 2022 event include those around Gliese 436, Gliese 486, and Gliese 367.

Terrestrial planet

2010). Transiting Exoplanets. Cambridge: Cambridge University Press. ISBN 978-0-521-13938-0. Perryman, Michael (26 May 2011). The Exoplanet Handbook. Cambridge

A terrestrial planet, tellurian planet, telluric planet, or rocky planet, is a planet that is composed primarily of silicate, rocks or metals. Within the Solar System, the terrestrial planets accepted by the International Astronomical Union are the inner planets closest to the Sun: Mercury, Venus, Earth and Mars. Among astronomers who use the geophysical definition of a planet, two or three planetary-mass satellites – Earth's Moon, Io, and sometimes Europa – may also be considered terrestrial planets. The large rocky asteroids Pallas and Vesta are sometimes included as well, albeit rarely. The terms "terrestrial planet" and "telluric planet" are derived from Latin words for Earth (Terra and Tellus), as these planets are, in terms of structure, Earth-like. Terrestrial planets are generally studied by geologists, astronomers, and geophysicists.

Terrestrial planets have a solid planetary surface, making them substantially different from larger gaseous planets, which are composed mostly of some combination of hydrogen, helium, and water existing in various physical states.

Planet

are also exoplanets that are much farther from their star. Neptune is 30 AU from the Sun and takes 165 years to orbit, but there are exoplanets that are

A planet is a large, rounded astronomical body that is generally required to be in orbit around a star, stellar remnant, or brown dwarf, and is not one itself. The Solar System has eight planets by the most restrictive definition of the term: the terrestrial planets Mercury, Venus, Earth, and Mars, and the giant planets Jupiter, Saturn, Uranus, and Neptune. The best available theory of planet formation is the nebular hypothesis, which posits that an interstellar cloud collapses out of a nebula to create a young protostar orbited by a protoplanetary disk. Planets grow in this disk by the gradual accumulation of material driven by gravity, a process called accretion.

The word planet comes from the Greek ???????? (plan?tai) 'wanderers'. In antiquity, this word referred to the Sun, Moon, and five points of light visible to the naked eye that moved across the background of the stars—namely, Mercury, Venus, Mars, Jupiter, and Saturn. Planets have historically had religious associations: multiple cultures identified celestial bodies with gods, and these connections with mythology and folklore persist in the schemes for naming newly discovered Solar System bodies. Earth itself was recognized as a planet when heliocentrism supplanted geocentrism during the 16th and 17th centuries.

With the development of the telescope, the meaning of planet broadened to include objects only visible with assistance: the moons of the planets beyond Earth; the ice giants Uranus and Neptune; Ceres and other bodies later recognized to be part of the asteroid belt; and Pluto, later found to be the largest member of the

collection of icy bodies known as the Kuiper belt. The discovery of other large objects in the Kuiper belt, particularly Eris, spurred debate about how exactly to define a planet. In 2006, the International Astronomical Union (IAU) adopted a definition of a planet in the Solar System, placing the four terrestrial planets and the four giant planets in the planet category; Ceres, Pluto, and Eris are in the category of dwarf planet. Many planetary scientists have nonetheless continued to apply the term planet more broadly, including dwarf planets as well as rounded satellites like the Moon.

Further advances in astronomy led to the discovery of over 5,900 planets outside the Solar System, termed exoplanets. These often show unusual features that the Solar System planets do not show, such as hot Jupiters—giant planets that orbit close to their parent stars, like 51 Pegasi b—and extremely eccentric orbits, such as HD 20782 b. The discovery of brown dwarfs and planets larger than Jupiter also spurred debate on the definition, regarding where exactly to draw the line between a planet and a star. Multiple exoplanets have been found to orbit in the habitable zones of their stars (where liquid water can potentially exist on a planetary surface), but Earth remains the only planet known to support life.

Methods of detecting exoplanets

Photoeccentric Effect Rossiter–McLaughlin effect List of exoplanets Lists of exoplanets Exomoon Exoplanet Lindegren, Lennart; Dravins, Dainis (31 January 2003)

Methods of detecting exoplanets usually rely on indirect strategies – that is, they do not directly image the planet but deduce its existence from another signal. Any planet is an extremely faint light source compared to its parent star. For example, a star like the Sun is about a billion times as bright as the reflected light from any of the planets orbiting it. In addition to the intrinsic difficulty of detecting such a faint light source, the glare from the parent star washes it out. For those reasons, very few of the exoplanets reported as of June 2025 have been detected directly, with even fewer being resolved from their host star.

Neptunian exoplanet

Neptunian exoplanets are similar in size to the ice giants Neptune and Uranus in the Solar System. Neptunian exoplanets may have a mixture of interiors

Neptunian exoplanets are similar in size to the ice giants Neptune and Uranus in the Solar System. Neptunian exoplanets may have a mixture of interiors though all would be rocky with heavier metals at their cores. Neptunian planets typically have hydrogen- and helium-dominated atmospheres.

There are several recognized subtypes of Neptunian exoplanets:

Hot Neptune – orbiting close to its star

Helium planet – a hypothetical type that can form from hot Neptune via hydrogen evaporation, leaving a helium-dominated atmosphere

Mini-Neptune – considerably smaller than Neptune but still having a thick hydrogen-helium envelope, relatively common

Super-puff – inflated planets with unusually low mean density

Hycean planet – a hypothetical transitional type to ocean planets with a thin, hydrogen-helium-dominated atmosphere overlaying a liquid water ocean

https://www.onebazaar.com.cdn.cloudflare.net/@15366750/eexperienceq/rregulateb/sattributej/cpheeo+manual+sew
https://www.onebazaar.com.cdn.cloudflare.net/+98255445/wapproachp/tfunctionf/lconceivez/indias+economic+deve
https://www.onebazaar.com.cdn.cloudflare.net/^59913449/jencounterm/eundermineh/pdedicateq/thrawn+star+wars+
https://www.onebazaar.com.cdn.cloudflare.net/^41458380/xcollapsez/nfunctionw/gtransportt/tohatsu+m40d+service
https://www.onebazaar.com.cdn.cloudflare.net/^90761322/ztransfere/uunderminet/cdedicateh/1994+lexus+es300+fr
https://www.onebazaar.com.cdn.cloudflare.net/!67446314/nadvertisep/yundermined/wconceivet/deep+time.pdf
https://www.onebazaar.com.cdn.cloudflare.net/-87071243/jtransferq/gintroducet/dattributek/theory+and+practice+of+creativity+measurement.pdf