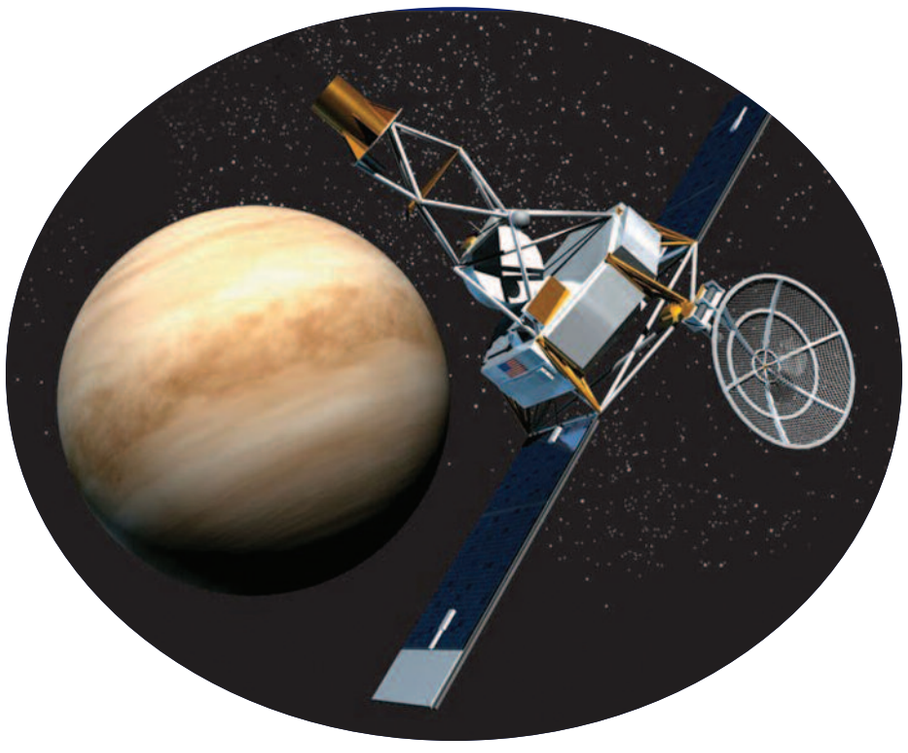
CHILDREN'S SPACE ENCYCLOPEDIA

ASTRONOMY



Orpheus

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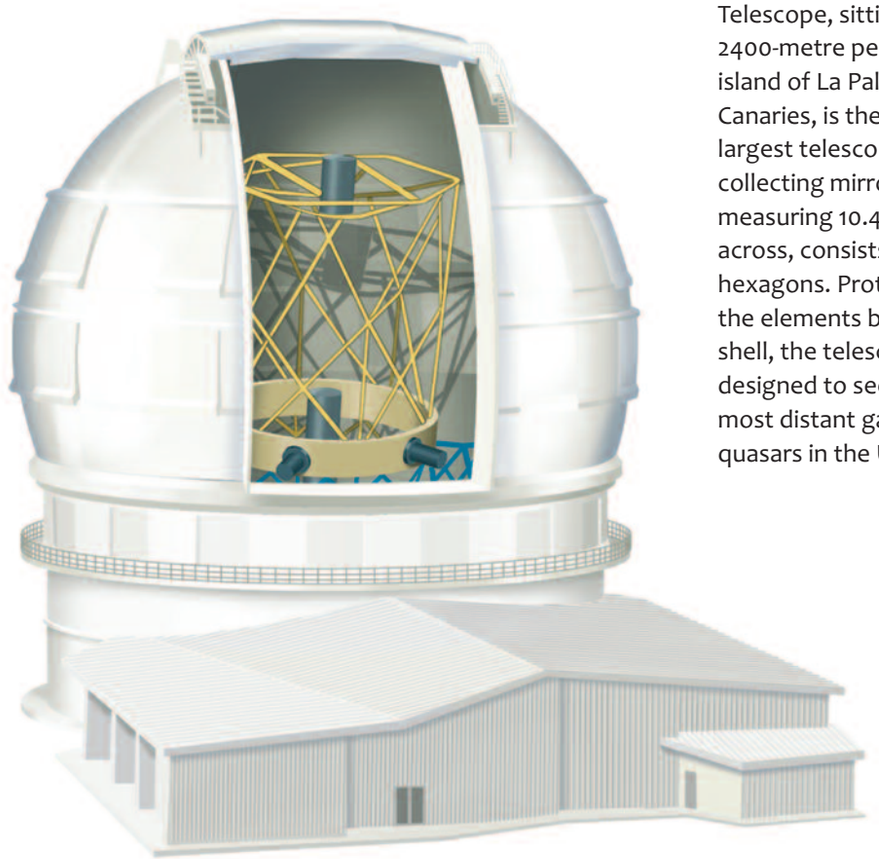
Introduction

Astronomy is the study of space, including planets, stars and galaxies. We can see some objects in space with just the naked eye, but many more, including those that are billions of light years away, can only be studied by using a powerful telescope. Information about the objects in space ("celestial bodies") is gained from studying visible light or other forms of electromagnetic radiation such as radio waves and X-rays given off or reflected by them. Much of what we now know about the planets comes from space probes, which travel through space sending information back to the Earth.



◀ The Gran Canaria Telescope, sitting atop a 2400-metre peak on the island of La Palma in the Canaries, is the world's largest telescope. Its light-collecting mirror, measuring 10.4 metres across, consists of 36 hexagons. Protected from the elements by a steel shell, the telescope is designed to seek out the most distant galaxies and quasars in the Universe.

History of astronomy

Thousands of years ago, in the time of the ancient civilizations of Egypt and China, people thought that the Sun and Moon were gods, the Earth was flat and the sky was a great dome suspended above it.

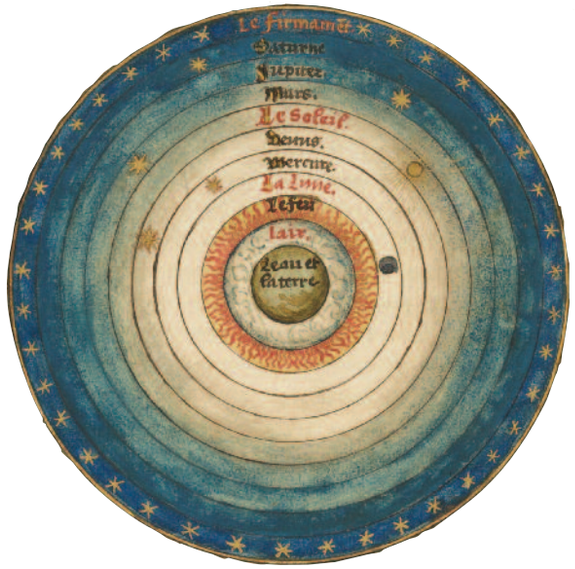
▶ In ancient Egyptian mythology, the god Horus was said to be the sky. The Sun was his right eye and the Moon his left. They travelled the sky when Horus, a falcon, flew across it. In this wall painting, the sky is symbolized by stars.

FACTFILE

The Antikythera Mechanism, built in ancient Greece between 150 and 80 BC, was designed to calculate the positions of the Sun, Moon and planets on any particular date. Consisting of at least 30 interlocked gears turned by a hand crank, it has been described as the world's oldest known analogue computer.

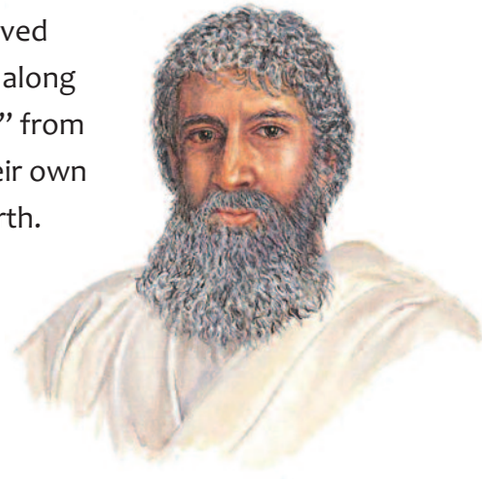
Ancient Greece

Astronomy was considered a branch of mathematics in ancient Greece. Greek astronomers named constellations, stars and planets and proved that the Earth was round. Many believed that the stars were fixed to a great sphere that rotated around the Earth each day. One 3rd-century BC Greek astronomer, Aristarchus, proposed that the planets, including Earth, orbited the Sun, a star, but most astronomers of this time thought that the Sun, Moon and planets all travelled in circular paths around Earth, the centre of the Universe.

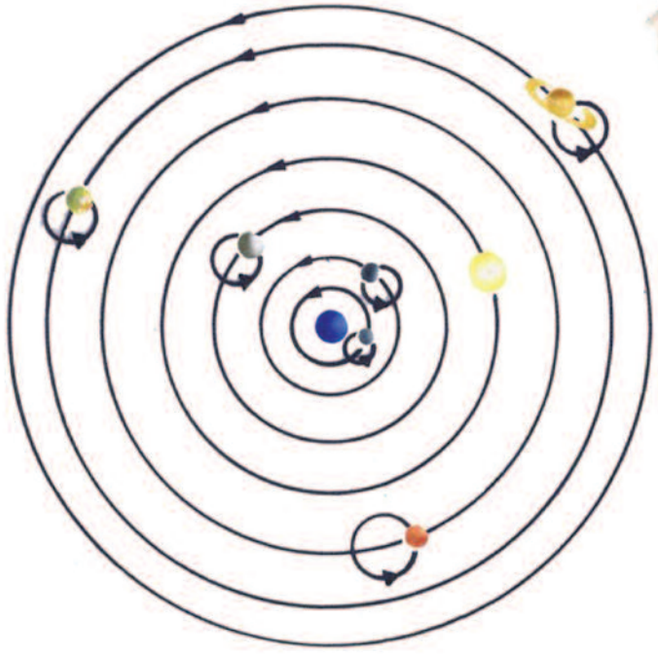


◀ A diagram made in the 16th century in France showing the planets, Sun (le soleil) and Moon (la lune) all orbiting the Earth.

Ptolemy, who lived in the 2nd century AD, observed that, while the stars moved across the night sky along regular paths, the planets appeared to "wander" from theirs. He proposed that they each moved in their own small circles, called epicycles, as they orbited Earth.



▲ Claudius Ptolemy (c. AD 90-c.168), was a scientist who lived in Alexandria, Egypt, and wrote in Greek. His work on astronomy was called the Almagest.



FACTFILE

Astronomy is not to be confused with astrology. Astrologers claim that there are links between the positions of the Sun, Moon and other celestial objects and people's personalities and events in their lives.

Babylonians

Babylon ruled a powerful empire in the 6th-7th centuries BC. The Babylonians were keen astronomers. They studied the stars and planets and tried to work out their positions in relation to the Earth. They believed that the Earth was a flat disc suspended in space on a cushion of air. Some scientists of ancient Greece also adopted this theory.

▲ Astronomers in ancient Babylon

Maya

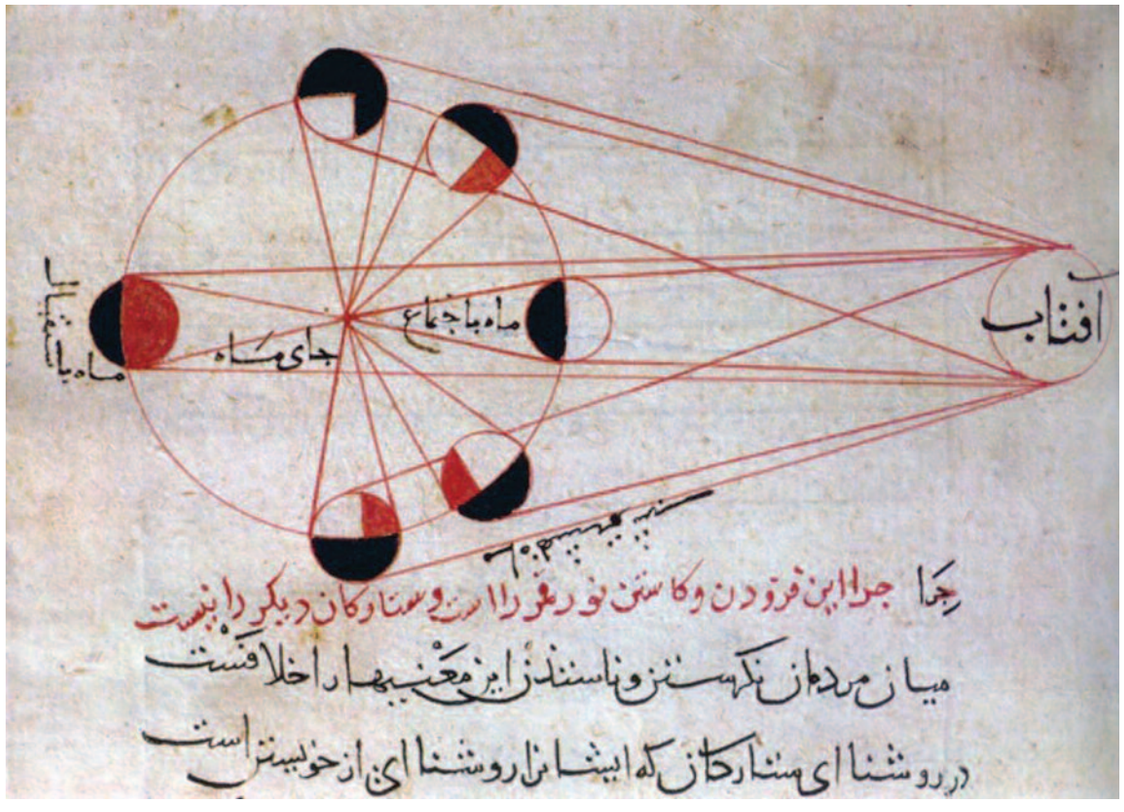
The Maya, who built a great civilization in what is now Mexico and Central America between AD 250 and 900, became very advanced in branches of astronomy and mathematics. Maya priests used this knowledge to draw up a calendar. Maya astronomers had no telescopes, but they may have used observatories to plot the positions of the planet Venus, Sun and Moon.

Islamic world

While there were few advances in astronomy in Europe during the Middle Ages, astronomy flourished in the Islamic World during its Golden Age, between the 8th and 15th centuries. The Persian astronomer Azophi made the first recorded observations of the Andromeda Galaxy in 964. The brightest stellar event in history, a supernova, was observed by the Arabic astronomer Ali ibn Ridwan in 1006. Muslim astronomers gave names to many stars during this period, including Aldebaran and Altair.

FACTFILE

It is believed that Great Zimbabwe, a city built in Africa between the 11th and 14th centuries, may have acted as an astronomical observatory. The location of stones are thought to line up with the rising of the Sun, Moon and bright stars on certain significant days of the year.

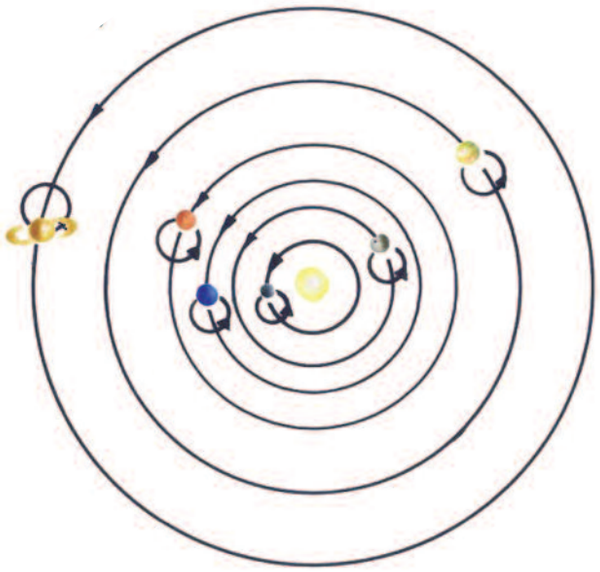


▲ A diagram of the different phases of the Moon, and a lunar eclipse, from observations by Arabic astronomer Al-Biruni (973-1048)

Nicolaus Copernicus

▲ Polish Roman Catholic canon Mikolaj Kopernik published his ideas in a book called On the Revolution of the Heavenly Spheres under the Latin version of his name, Copernicus, in the year of his death.

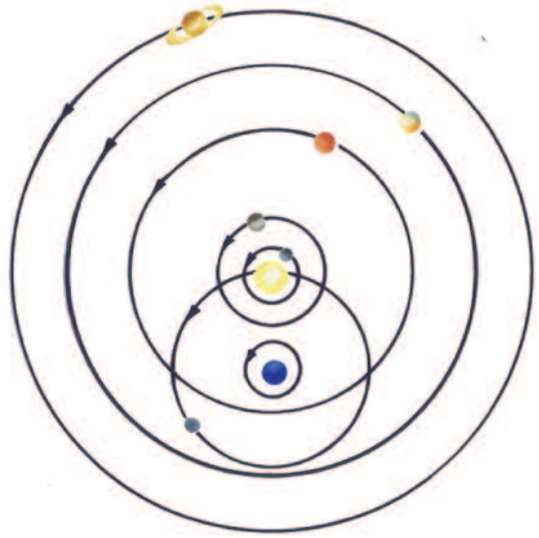
The Polish priest and astronomer, Nicolaus Copernicus (1473–1543), challenged Ptolemy's view of the Solar System, declaring—correctly—that the Sun lay at the centre of a system of orbiting planets. Only the Moon orbited the Earth. Copernicus did, however, wrongly believe that the planets' orbits were perfect circles and that they moved in epicycles.



▲ Danish astronomer Tycho Brahe lived a colourful life. He wore a false nose made of gold, silver, and wax to replace part of the real one he lost while fighting a duel.

Tycho Brahe

No supporter of the Copernican view, Danish astronomer Tycho Brahe (1546–1601) realized that the Ptolemaic system did not work either. His careful measurements of the planets' movements suggested some other pattern. Brahe's proposal that the planets orbited the Sun while the Sun moved around the Earth gained few supporters, however.



▶ Tycho Brahe

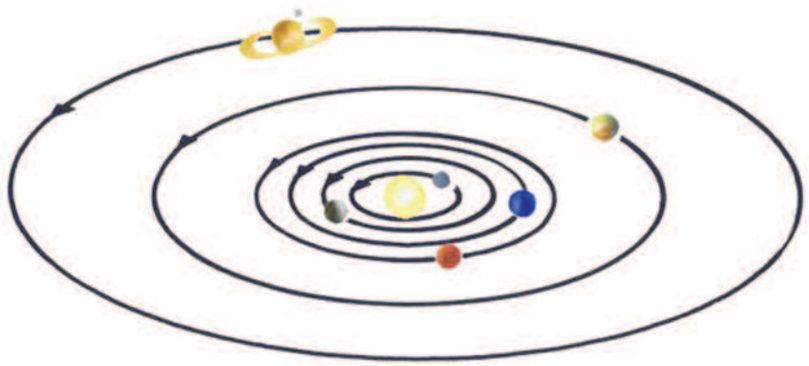
FACTFILE

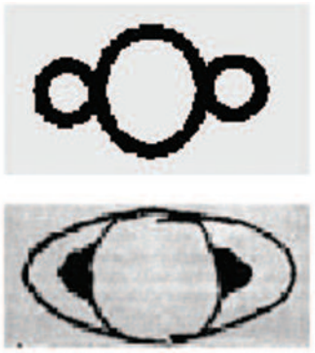
The word astronomy comes from the Greek words *astron*, "star" and *nomos*, "law". It literally means "law of the stars".

Johannes Kepler

It was left to the German astronomer Johannes Kepler (1571–1630), who showed, using Brahe's detailed observations, that the planets moved in elliptical, rather than perfectly circular, orbits. The shapes of their orbits also explained the "wandering" that so perplexed earlier observers, thus disproving the idea that the planets moved in epicycles. Kepler was the first person to arrive at the completely correct view of the Solar System.

▲ Johannes Kepler was both a brilliant mathematician and a believer in astrology. He suffered religious persecution, led an unhappy life, and died in poverty.

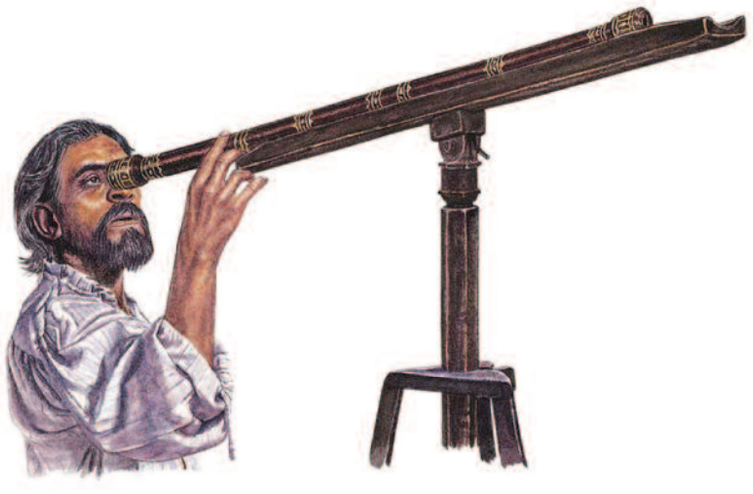




▲ Galileo's sketches of the view of Saturn he saw through his telescope in 1612. The second is a fairly accurate depiction of the rings, even though he did not identify them as such.

Galileo

Italian scientist Galileo Galilei (1564–1642) was the first person to use a telescope, newly invented in 1608, to study the heavens. Using a telescope of his own design, he found, to his amazement, great mountain ranges and craters on the Moon.

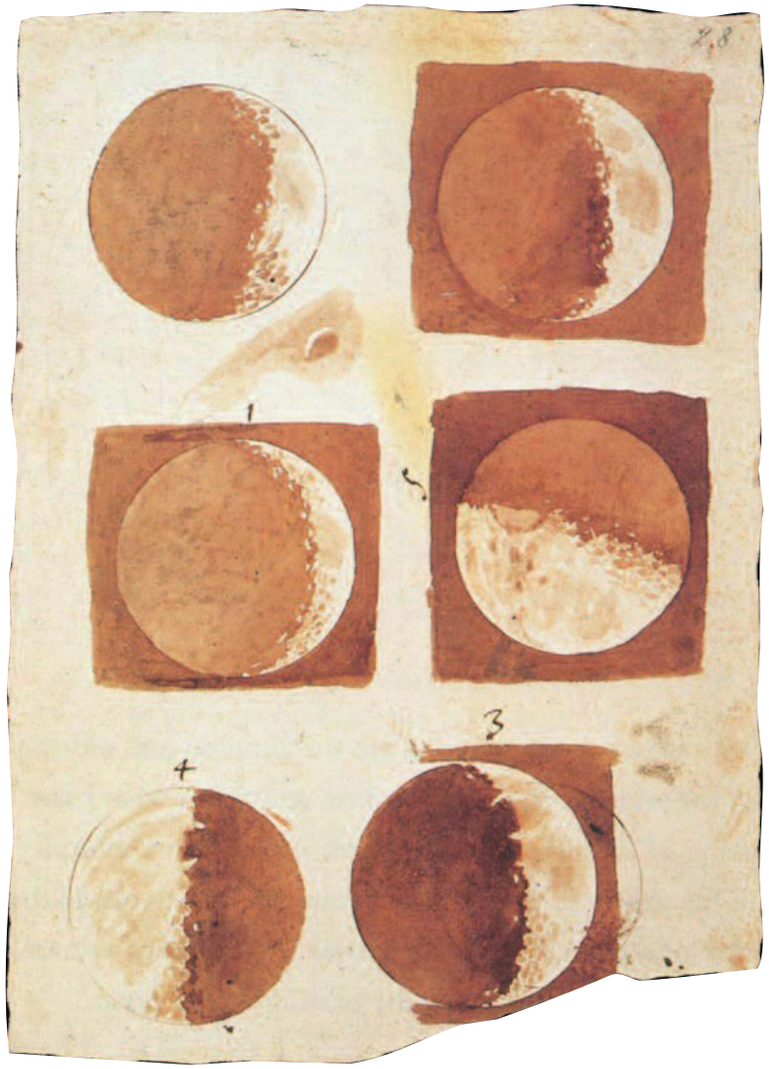


▲ Galileo using his telescope

▲ A portrait of Galileo

Galileo was puzzled by the bulges he could see on either side of the planet Saturn. Some nights he could see them, other nights he could not. He even thought they could be separate planets, lying close with Saturn itself. We know now that these bulges were, in fact, the famous rings of Saturn, but that, because of their tilted angle, the view of them from Earth changes from one night to the next. When viewed from edge on, they are hard to see. At a different angle, they are much more visible, although through Galileo's simple telescope they looked to him like bulges. The exact nature of the rings was not known until 1667, some years after Galileo's death.

Galileo witnessed the phases of Venus—its changing shape from crescent to full disc as it circles the Sun—and discovered many new stars never seen before. Galileo also discovered four large Moons circling Jupiter. That they clearly orbited their "parent" planet was, to him, firm evidence that not all objects in the Universe orbited the Earth. From this, he concluded that Copernicus's view of the Solar System had been correct: the planets do orbit the Sun.



◀ The phases of the Moon sketched by Galileo from observations made through his telescope

FACTFILE

German-born British astronomer William Herschel (1738–1822) discovered the planet Uranus in 1781 using a home-built telescope. Uranus was the first new planet found since ancient times.

FACTFILE

In the 1920s, observations by astronomer Edwin Hubble proved for the first time that our own galaxy, the Milky Way Galaxy, is just one of many galaxies in the Universe.

Observing space

A clear night is the best time to observe space from Earth. On many nights, the Moon is the brightest and largest object in the night sky. Up to 10,000 stars may be visible to the naked eye. All of them belong to the Milky Way Galaxy. From Earth, our view of one of the Galaxy's spiral arms looks like a misty band across the sky. This is the "milky way" from which the Galaxy takes its name. Up to five planets (Mercury, Venus, Mars, Jupiter and Saturn) can also be spotted. You might also catch sight of a comet. Shooting stars are streaks of light that last usually for less than a second. They are tiny rock fragments, called meteors, burning up high above Earth.

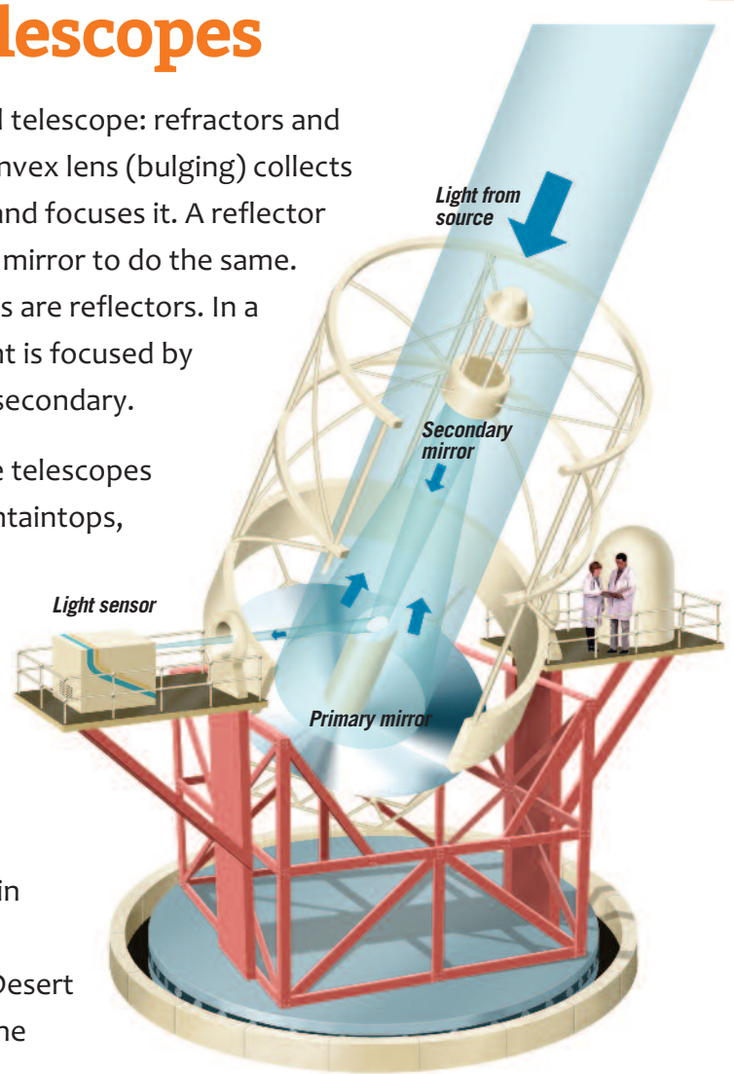
More can be seen through binoculars or simple telescopes, but to study in detail these objects or other objects that lie millions, or even billions, of light years away, powerful telescopes must be used.

▶ The Milky Way as seen from Earth

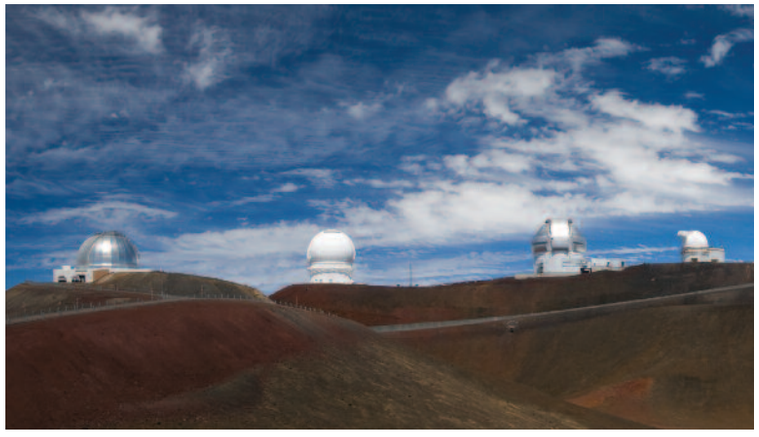
Reflector telescopes

There are two kinds of optical telescope: refractors and reflectors. In a refractor, a convex lens (bulging) collects light from the distant object and focuses it. A reflector uses a concave (dish-shaped) mirror to do the same. Most large modern telescopes are reflectors. In a Cassegrain-type reflector, light is focused by two mirrors: a primary and a secondary.

Modern observatories, where telescopes are housed, are built on mountaintops, above the densest, cloudiest parts of the atmosphere, or in the desert, far from the lights from cities (called "light pollution" by astronomers). Mauna Kea, Hawaii, is one of the best observing mountaintop sites in the world and has many observatories. The Atacama Desert in northern Chile has one of the darkest night skies on Earth.



▲ Inside a reflector telescope



◀ Observatories on Mauna Kea, Hawaii

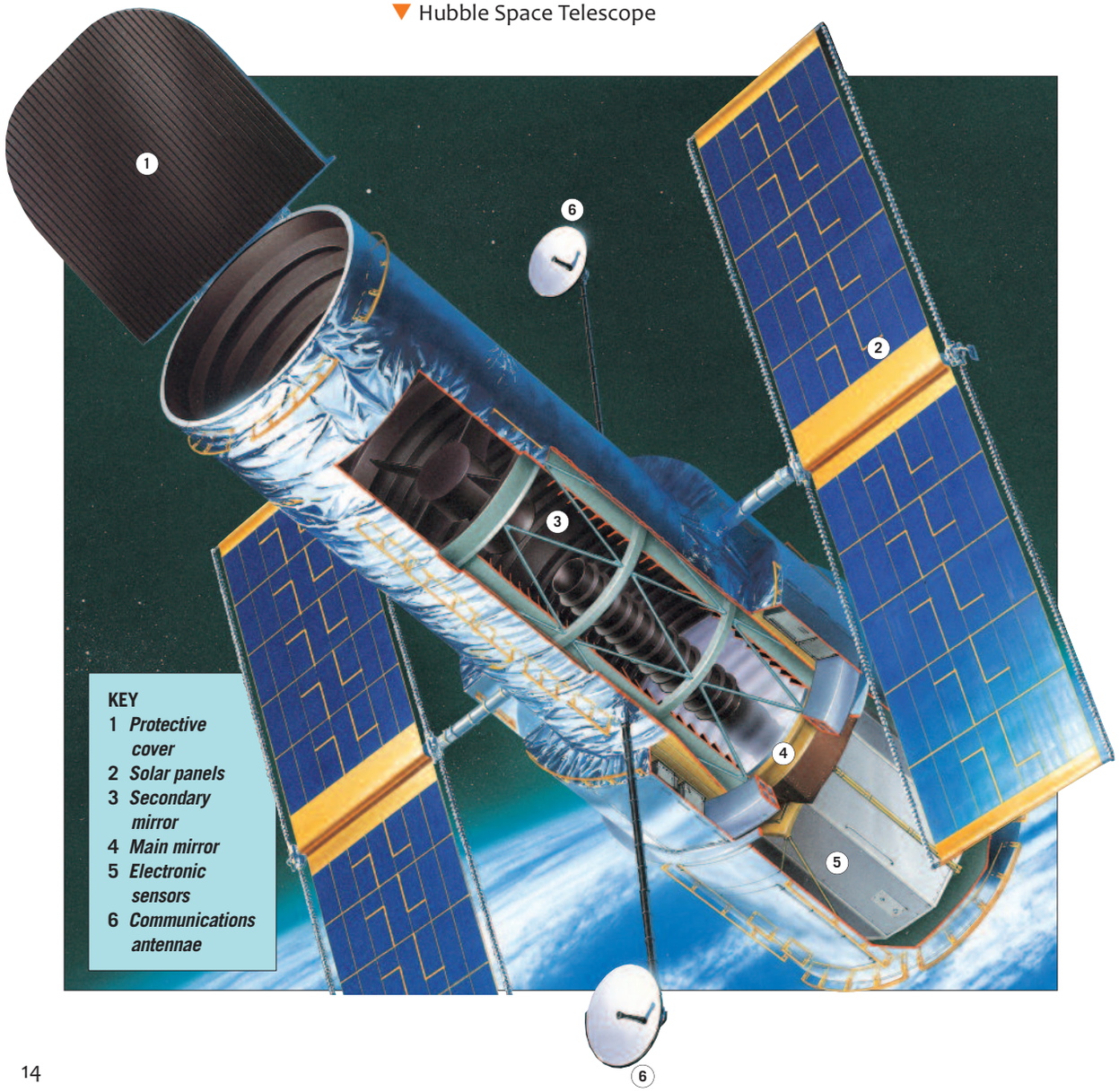
FACTFILE

The Hubble Space Telescope is so powerful it could detect light from a tiny torch 400,000 kilometres away.

Hubble Space Telescope

The Hubble Space Telescope orbits 616 kilometres (383 miles) above Earth. Scientists can point it in any direction and receive pictures of distant stars that are clearer than those taken from most Earth-based telescopes. This is because these telescopes suffer from polluted air, clouds and atmospheric disturbances.

▼ Hubble Space Telescope



Detecting radiation

Another type of telescope does not collect light rays at all. Instead, it detects radio waves. Stars and galaxies give off other kinds of radiation as well as light: infrared, ultraviolet, X-rays and radio waves. There are some objects in space that only give off these kinds of radiation. They are otherwise invisible. Large radio telescopes look like giant satellite dishes. They are specially designed to collect radio waves and can be turned to face any part of the sky.

▲ This image of the Horsehead Nebula, in the constellation of Orion, was produced in May 2013 combining images from the VISTA Telescope and the Hubble Space Telescope. The VISTA (Visible and Infrared Survey Telescope for Astronomy) is a ground-based reflector telescope located at the Paranal Obervatory in Chile.

◀ Very Large Array radio telescopes, San Augustin, New Mexico. The VLA consists of 27 dish antennae, positioned along the three arms of a Y-shape, each arm measuring 21 kilometres. Together they act as a single dish with a diameter of 26 kilometres.

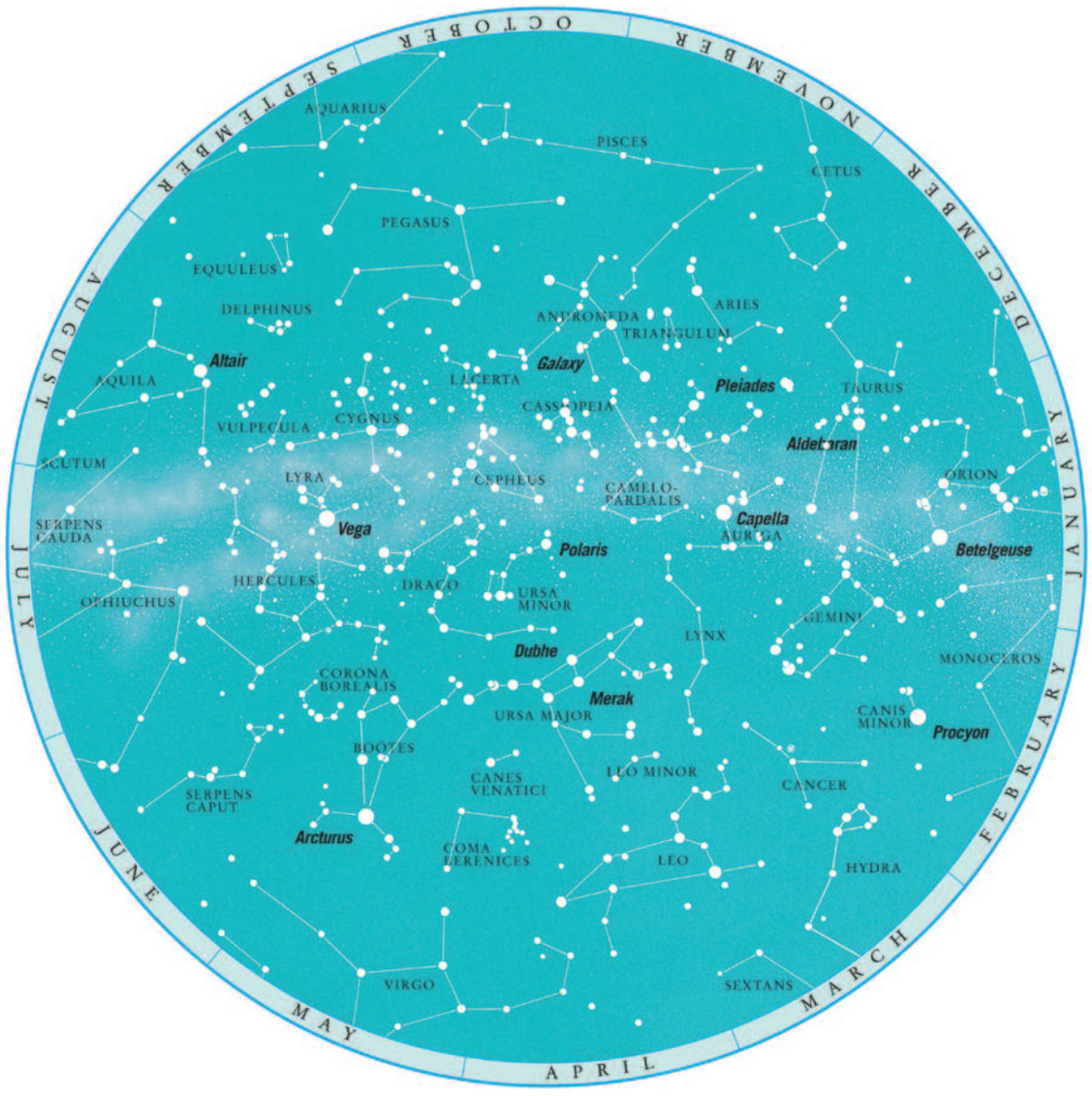
Constellations

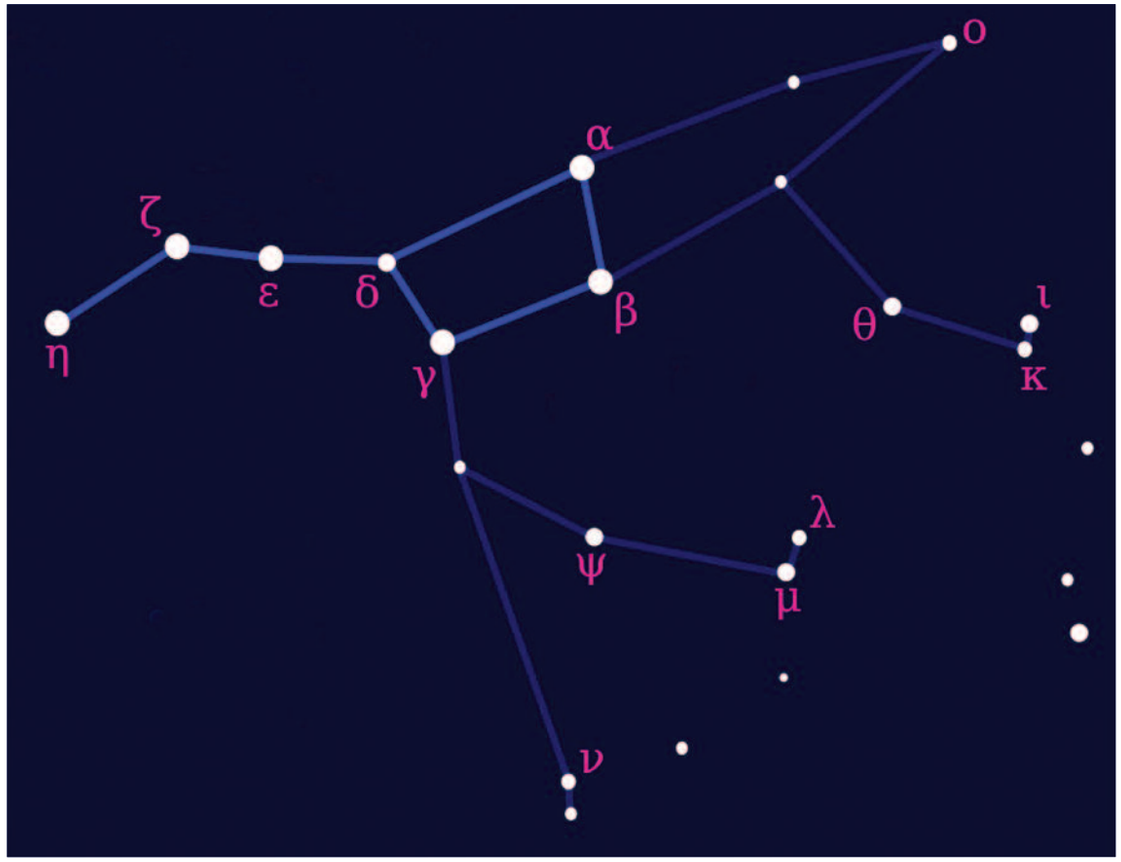
▼ This chart shows the stars and constellations that can be seen from the Northern Hemisphere. Viewed with the present month is at the bottom of the chart at 10.00 pm, and facing south, on a clear night you should be able to locate many of the stars and constellations on the chart.

Before telescopes were invented in the 1600s, astronomers grouped the stars together into patterns, imagining their shapes to look like gods, heroes and sacred beasts from popular legends. The ancient Greeks knew of 48 constellations, having inherited some from the Babylonians. Today, the sky, including both Northern and Southern Hemispheres, is divided into 88 constellations.

The first people from Europe to see the Southern Hemisphere skies were explorers, sailing the southern Atlantic and Pacific Oceans. To constellations they had never seen before they gave new names such as The Painter (Pictor), The Crane (Grus) and The Dove (Columba). The constellation of Centaurus, the Centaur, contains the nearest stars to Earth apart from the Sun: Proxima Centauri and Alpha Centauri (the nearest visible). They are "only" 4.2 light years away—a mere 40 trillion kilometres. You can also see the Large and Small Magellanic Clouds, two of the galaxies closest to our own.

▼ This chart shows the stars and constellations that can be seen from the Southern Hemisphere. Viewed with the present month is at the bottom of the chart at 10.00 pm, and facing north, on a clear night you should be able to locate many of the stars and constellations on the chart.





▲ The Plough (also called the Big Dipper) is an asterism made up of the seven brightest stars in the constellation of Ursa Major (Great Bear).

FACTFILE

Stars in most constellations look as if they are close together but are in fact located far apart in space. An exception is Ursa Major, some of whose stars are actually relatively close to one another.

Asterisms

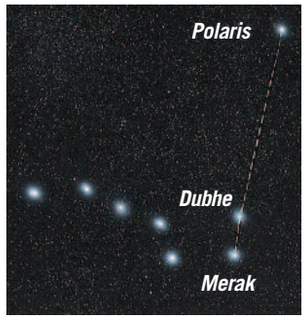
In modern astronomy, a constellation is a defined area of the sky. Each area is grouped around an asterism, a pattern formed by prominent stars that lie close to one another as viewed in the Earth's night sky. The stars of the asterism as given Greek letters in their order of brightness. The most prominent stars also have proper names, often their Arabic ones. There are 1564 stars that have proper names.

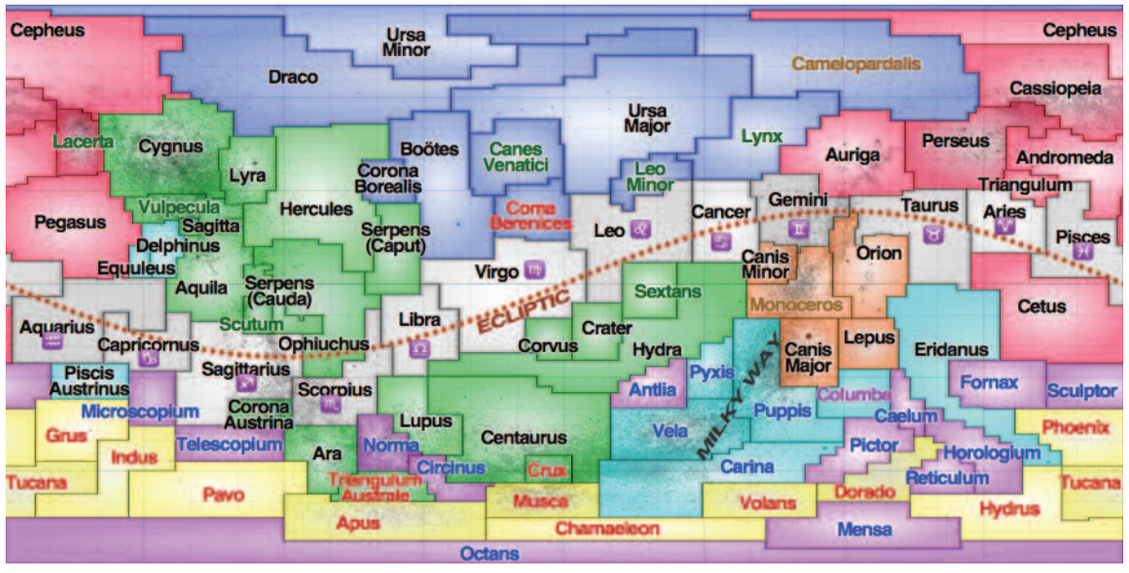
Ecliptic

The ecliptic is the path taken by the Sun across the sky as observed from Earth over the course of the year. The paths of the Moon and planets also remain close to the ecliptic. Because the Earth takes one year to complete its orbit of the Sun, so the Sun also takes a year to make a complete circuit of the ecliptic. It moves a small distance, about 1° eastwards, every day.

Babylonian astronomers around the 7th century BC divided the ecliptic into 12 signs of the zodiac. These were 12 equal zones of 30° each, and they were named after nearby constellations, such as Gemini, Aries, Pisces etc. After the constellation boundaries were drawn up by astronomers in 1930, the ecliptic now passes through a 13th constellation: Ophiuchus.

▼ A line running from the two end stars in the Plough, Merak and Dubhe, point to Polaris, the Pole Star, which lies almost exactly due north.





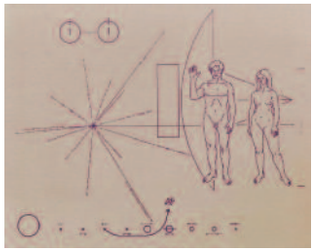
▲ A map of the night sky showing the path of the Sun, called the ecliptic, as it travels across the background of constellations, whose boundaries are shown here. The twelve signs of the zodiac are named after the constellations that the Sun passes "through".

FACTFILE

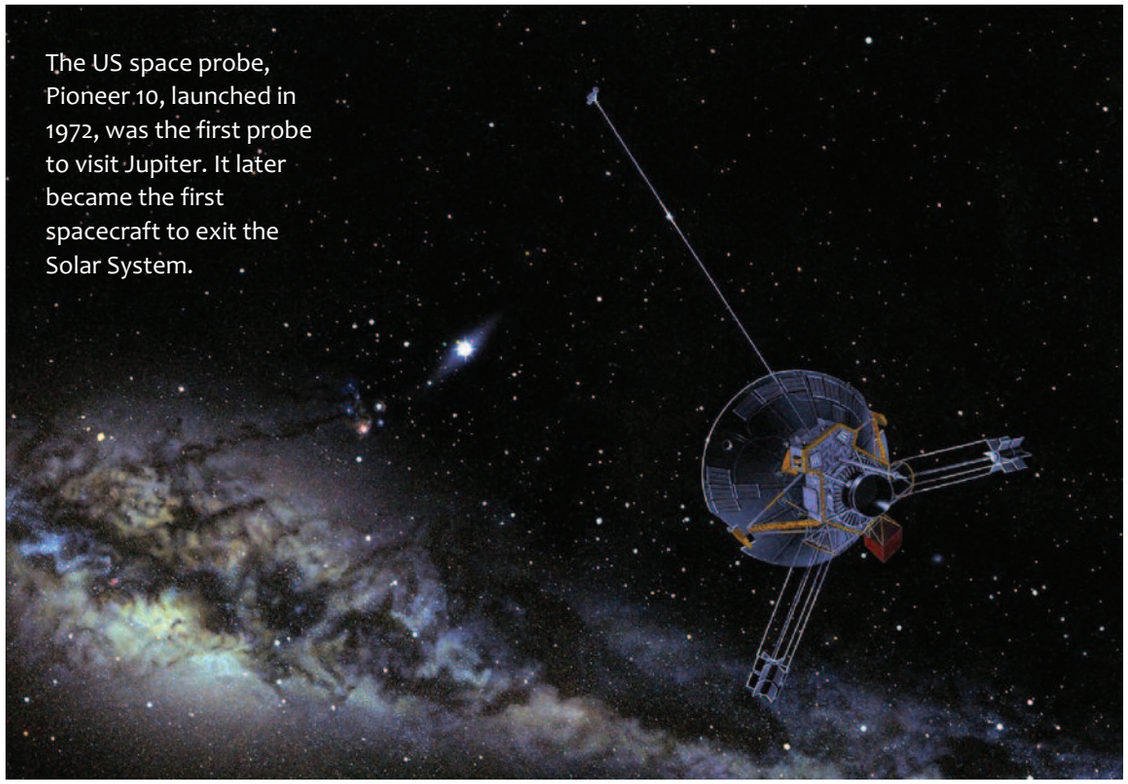
The Pioneer space probes were the first human-built objects to leave the Solar System.

Space probes

To study other bodies in the Solar System, even the most powerful telescopes are limited in what images and other information they can provide. Manned space missions to other planets are dangerous and expensive. Most other worlds in our Solar System have environments that are too hostile or too distant for humans to explore (a trip to Neptune, for example, would take several years). In order to gather detailed information about other planets and moons, a number of space probes—unmanned, remote-controlled spacecraft—have been launched instead. Equipped with cameras and sensing equipment, they can transmit information back to Earth much more cheaply and safely.

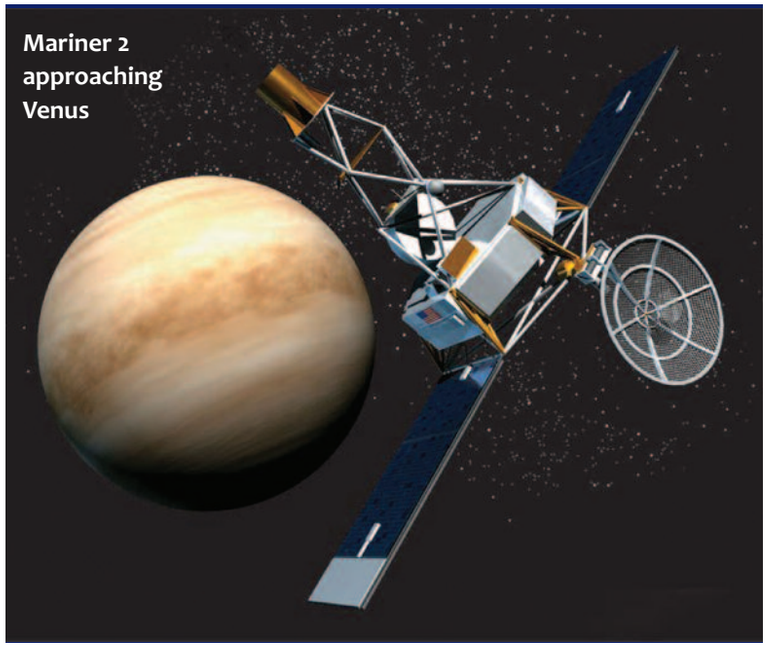


▲ The plaque carried by Pioneer 10



The US space probe, Pioneer 10, launched in 1972, was the first probe to visit Jupiter. It later became the first spacecraft to exit the Solar System.

Probe missions

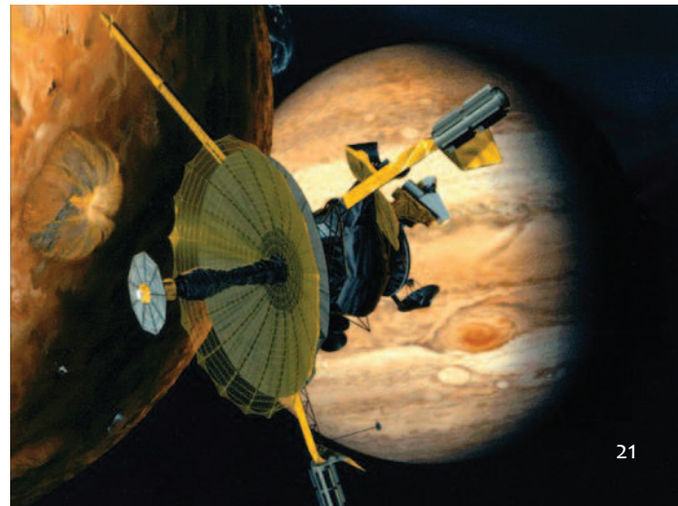


Mariner 2 approaching Venus

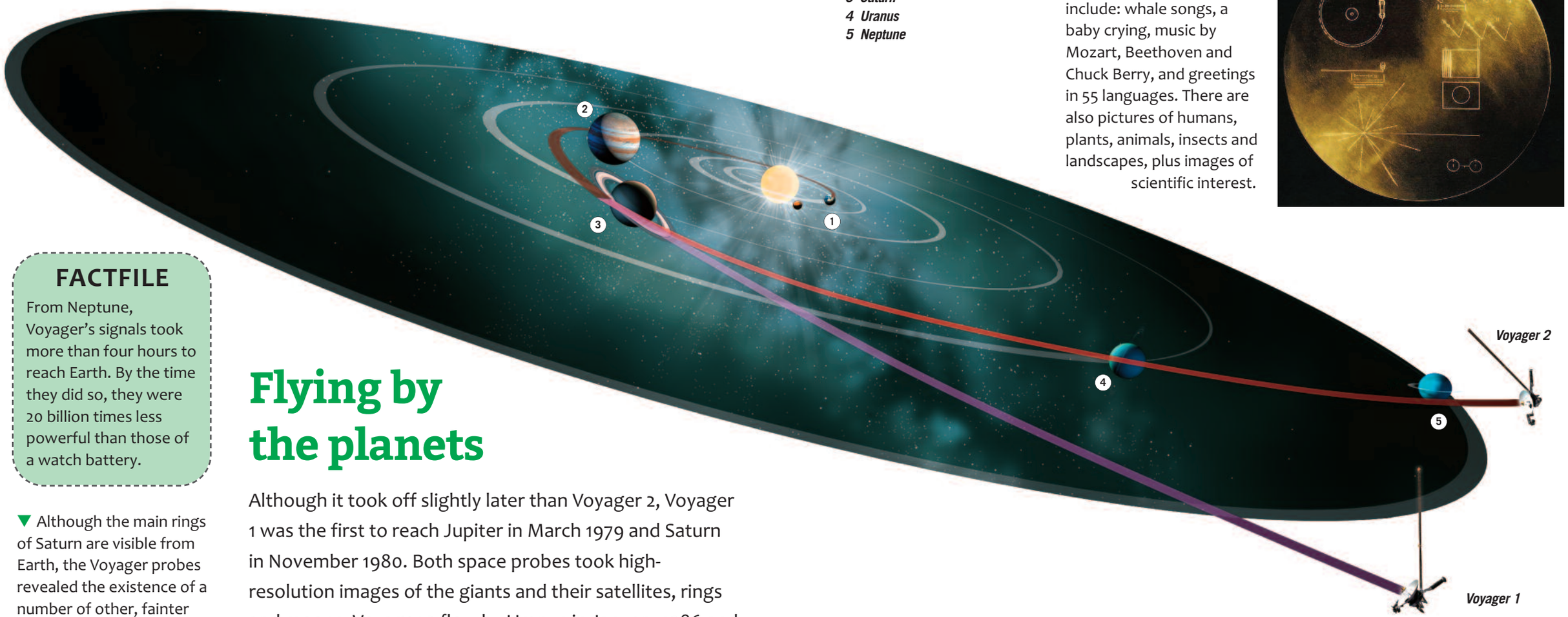
US spacecraft Mariner 2 became the first space probe successfully to reach another planet when it flew by Venus in December 1962. From a distance of 34,800 kilometres (21,600 miles), its detectors captured data from Venus's surface.

The first space probe to make a successful soft landing on the Moon was the Soviet Luna 9 in 1966. It sent back TV pictures after its protective "petals" opened. The US space probe Pioneer 10 was the first probe to travel through the asteroid belt and fly by Jupiter. Launched in 1989, the Magellan space probe used radar to "see" through Venus's thick atmosphere and make images of its surface.

▼ The Galileo space probe entered into orbit around Jupiter—the first probe to do so—in 1995. It carried a small descent probe, which it released into Jupiter's atmosphere, from where it sent back data. Other detectors and cameras took images of Jupiter and its moons. In 2003 Galileo was deliberately destroyed by steering it into Jupiter's atmosphere. This eliminated the possibility of contaminating any of Jupiter's moons with bacteria from Earth.



Voyager space probes



FACTFILE

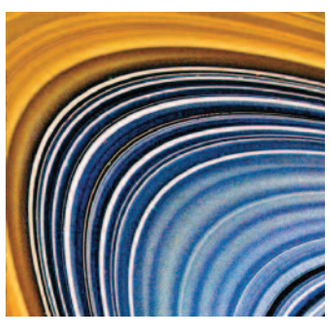
From Neptune, Voyager's signals took more than four hours to reach Earth. By the time they did so, they were 20 billion times less powerful than those of a watch battery.

Flying by the planets

Although it took off slightly later than Voyager 2, Voyager 1 was the first to reach Jupiter in March 1979 and Saturn in November 1980. Both space probes took high-resolution images of the giants and their satellites, rings and moons. Voyager 2 flew by Uranus in January 1986 and Neptune in August 1989, sending back amazingly clear pictures of Neptune's moon, Triton.

The twin space probes, Voyager 1 and Voyager 2, were launched in 1977. They took advantage of a rare alignment of the outer planets, Jupiter, Saturn, Uranus and Neptune, to make fly-bys of all four possible. The flight trajectory of Voyager 2 was carefully designed so that it could use the gravity field of each planet to provide the necessary force to to change the speed and direction of the spacecraft to get it from one planet to the next.

▼ Although the main rings of Saturn are visible from Earth, the Voyager probes revealed the existence of a number of other, fainter ones. They also showed that the main rings were in fact made up of thousands of ringlets, each consisting of billions of blocks of ice.



▶ The Voyagers carry audiovisual discs featuring "Sounds of Earth". These include: whale songs, a baby crying, music by Mozart, Beethoven and Chuck Berry, and greetings in 55 languages. There are also pictures of humans, plants, animals, insects and landscapes, plus images of scientific interest.

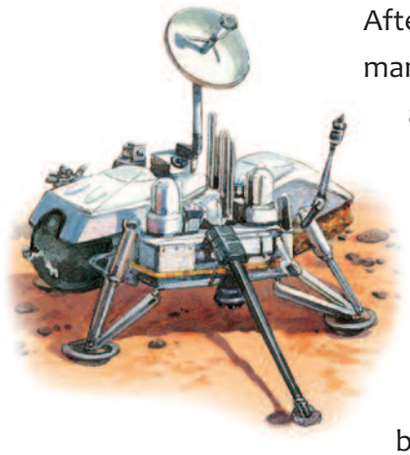
Interstellar Mission

Their initial missions accomplished, both Voyagers are now travelling out of the Solar System: Voyager Interstellar Mission is underway. They have passed through the boundary beyond which the Sun's influence ceases. Now, at more than 19 billion kilometres (12 billion miles) from Earth, Voyager 1 is the most distant manmade object in the Universe. Both probes have adequate electrical power to continue sending back signals until around 2025.

▼ Voyager transmits and receives signals to and from Earth via a 3.7-metre antenna dish always pointed towards us. It carries a range of detectors and cameras.

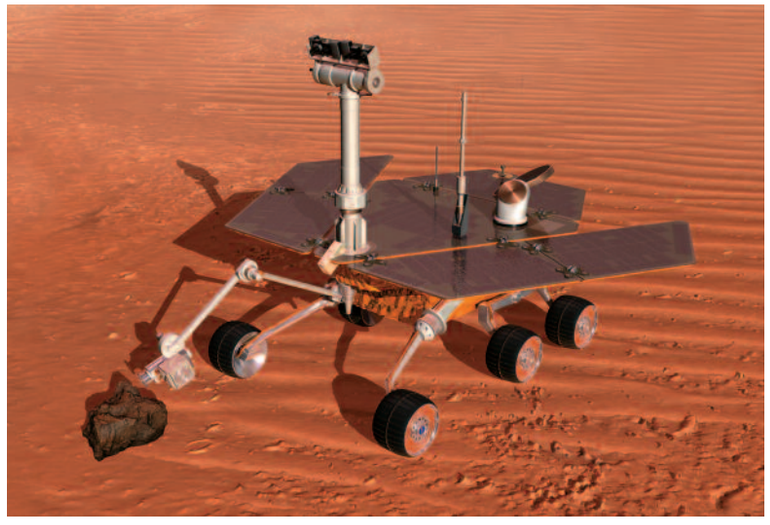
Mars space probes

▼ Viking 1 space probe



After the Moon, the next most likely target for a manned space mission is Mars. The Red Planet has already been the object of some 40 space probe missions, as a result of which orbiters, landers and rovers have sent back detailed pictures of the Martian surface. The first probes to land on Mars and complete their missions were the US Viking 1 and Viking 2 probes, in 1976. Along with the first colour photos of the Martian surface, they sent back information that showed for the first time how Mars's landscape had been sculpted by running water.

▶ Enduring dust storms and rocky terrain, Spirit and Opportunity have each travelled several kilometres over the Martian surface. Powered by solar panels, each rover is equipped with cameras and a robotic arm. Contact with Spirit was lost in 2010, but Opportunity was still operating in 2015.



The first rover, Sojourner, was carried by the Mars Pathfinder probe which landed in 1997. It was followed by the twin rovers Spirit and Opportunity, which landed in 2004. The Mars Space Laboratory, known as Curiosity, launched in 2011. One of its main objectives is to find out whether Mars is, or has ever been, capable of supporting microbial life. It successfully landed on Mars in 2012.

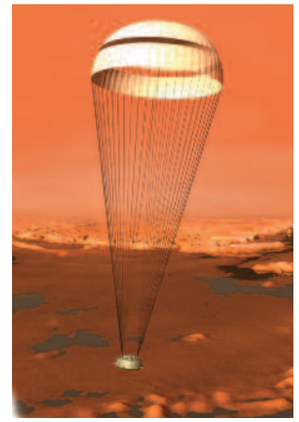
FACTFILE

The Phoenix lander was the first probe to visit the polar region of Mars, where it witnessed snow falling.

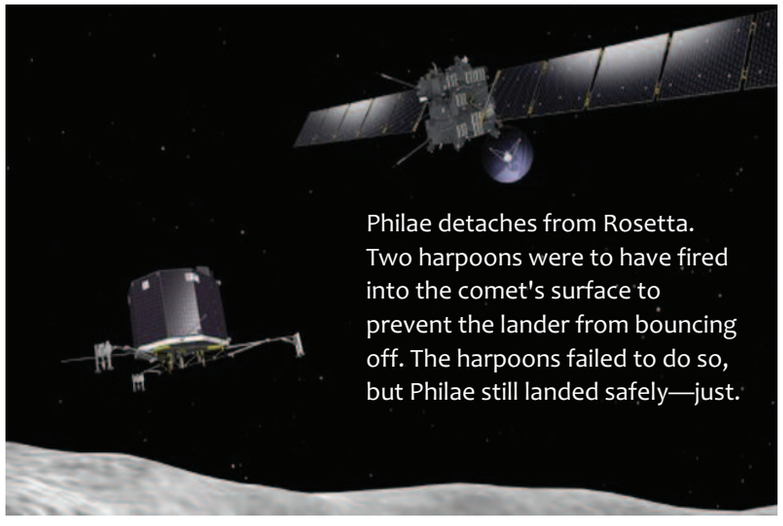
Cassini

The Cassini space probe was launched in October 1997. Its objective was to study Saturn and its moons. Attached to the probe was the Huygens lander. It separated from the main craft and descended through the atmosphere of Saturn's moon Titan to land on its surface in January 2005. For 90 minutes it transmitted pictures and information back to Earth. Cassini itself remains in orbit around Saturn.

▼ The Huygens lander descends from the Cassini space probe to the surface of Titan in 2005.



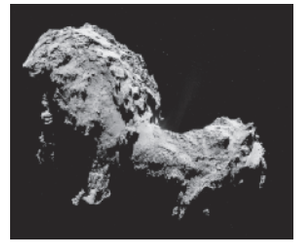
Rosetta and Philae



Philae detaches from Rosetta. Two harpoons were to have fired into the comet's surface to prevent the lander from bouncing off. The harpoons failed to do so, but Philae still landed safely—just.

The space probe Rosetta was launched in March 2004. It reached Comet 67P/Churyumov–Gerasimenko in May 2014 and entered into orbit around it. In November, Rosetta released a small lander, called Philae, that descended on to the comet's surface. Images beamed back from Philae revealed a landscape of precipices, craters and boulders. It later detected water coming off the comet's surface.

▼ Photo of Comet 67P/Churyumov–Gerasimenko taken by Rosetta's camera



▼ A shot of Philae taken from Rosetta

Extraterrestrial life

Upsilon Andromedae d is an extrasolar planet that lies in the habitable zone of the star Upsilon Andromedae, which is known to have a planetary system like the Sun's. It is likely to be a gas giant like Jupiter, so it may also have moons with liquid water on their surfaces, a basic condition for the presence of life.

Extraterrestrial life is any life that does not originate from Earth. None has so far been discovered. Often described as alien life, or aliens, extraterrestrial life might range from simple, bacteria-like organisms (living things) to intelligent, complex life-forms—perhaps even more advanced than humans. The search for other worlds that could host life ranges from our neighbouring planet Mars, to more distant moons such as Europa or Titan, or planets that have been discovered in other solar systems many light years away.

If life was able to arise on Earth, then it could have arisen on other planets with similar characteristics. Astronomers have now discovered several hundred planets, called extrasolar planets or exoplanets, that orbit other stars. If they were to meet certain conditions, it is possible that these planets might host complex life—or even intelligent beings like ourselves.

FOR LIFE TO EXIST ON AN EXOPLANET...

1) the parent star must be of average size: very big stars have short lifetimes, so life would not have a chance to evolve, while small stars may not radiate sufficient energy.

2) the planet should orbit the star within what is called the habitable, or "Goldilocks", zone, neither too close nor too far, where water can exist in a liquid state on the surface.

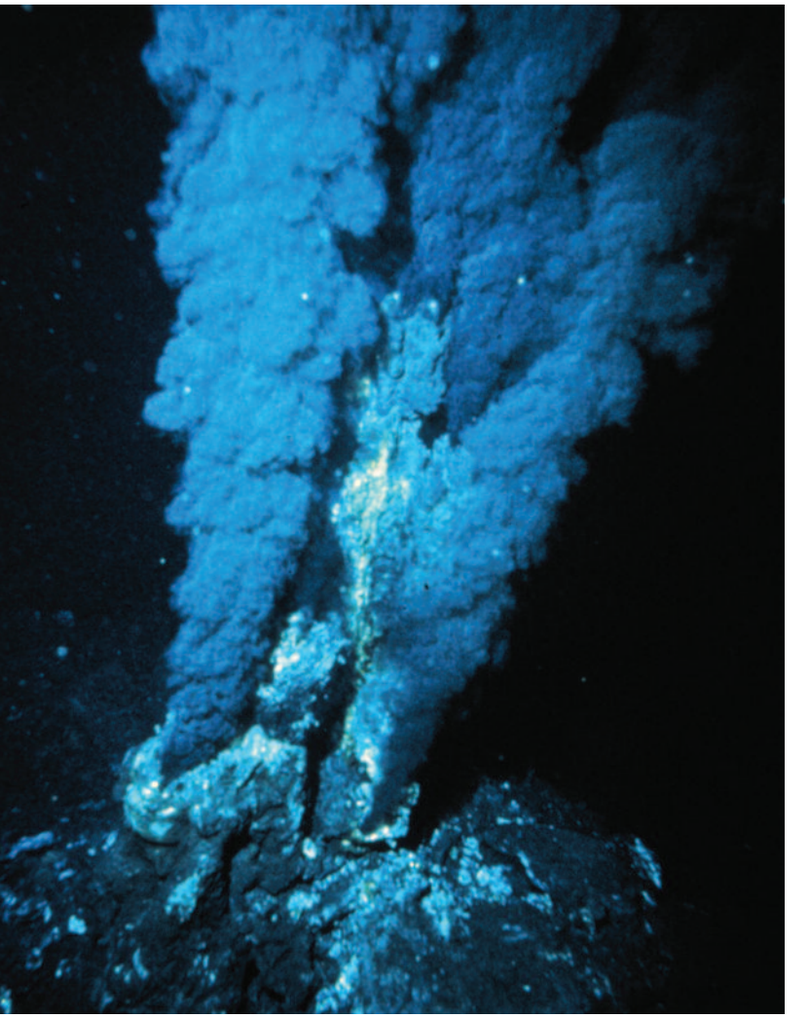
3) the planet should have an atmosphere, to trap enough of the star's energy to avoid temperature extremes, to screen it from harmful radiation and to act as a shield to bombardment by meteoroids.

4) there should be a gas giant like Jupiter (but not so close as to affect its orbit) which will attract comets and asteroids to itself, and thus spare the planet from devastating impacts.

5) the planet should have a magnetic field, to protect it from streams of charged particles, and spin on a tilted axis.

Conditions for life

▼ Hydrothermal vents are cracks in the sea bed where hot water spurts out through rocky chimneys called "black smokers". The water is rich in dissolved minerals. Bacteria convert the heat and minerals into food, and more complex organisms feed on the bacteria.

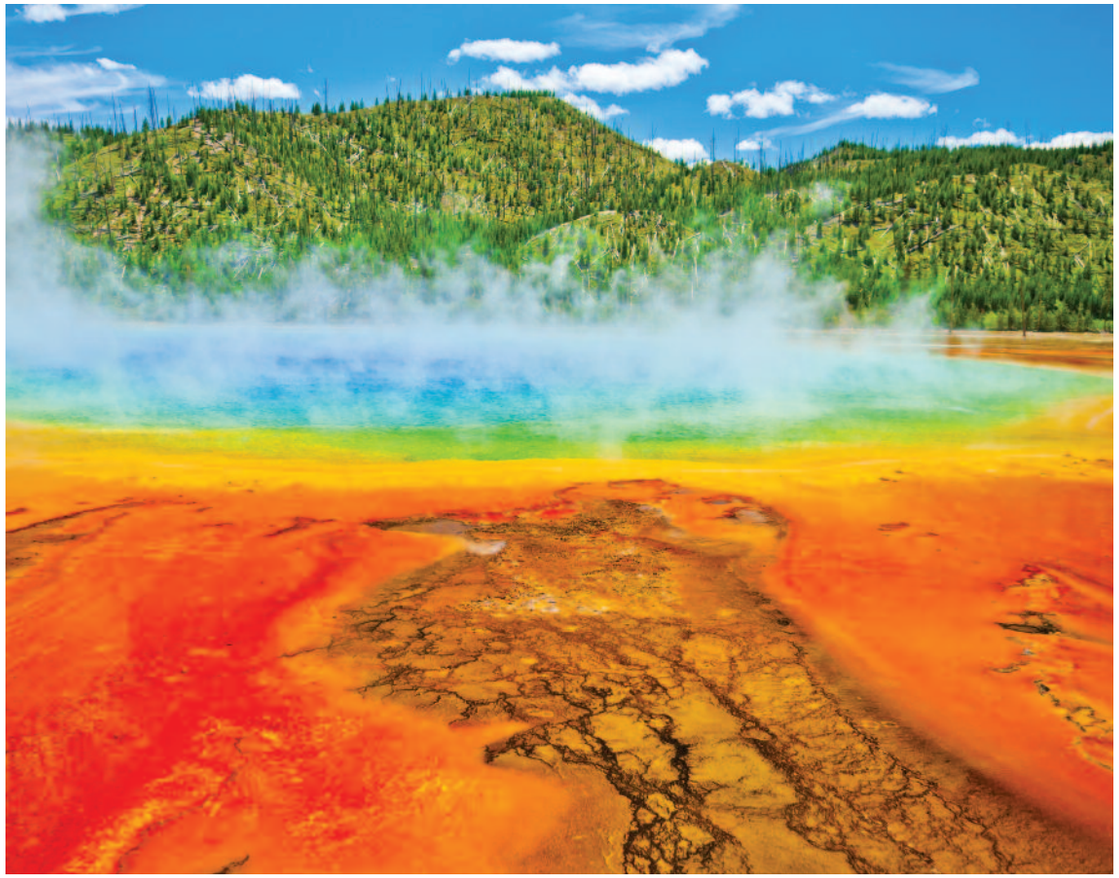


Most scientists assume that extraterrestrial life will probably have the same chemical composition as organisms (living things) on Earth. Carbon is the one element that can form the wide range of complex molecules necessary to create living cells. The presence of liquid water provides the essential solution in which such molecules form.

There also needs to be a source of energy, providing food for the organism. It was once thought that this energy must come direct from the Sun. Plants use sunlight to produce sugars from carbon dioxide and water—and plants, both on land and in water, are the vital link in any food chain. Now it is known that certain deep-sea organisms rely for their food on an energy source other than the Sun.

These are bacteria that take their energy from chemicals in the Earth's crustal rocks (dissolved minerals spurted out through rock chimneys, called black smokers, found in hydrothermal vents, cracks in the ocean floor). The discovery shows there may be more possible extraterrestrial habitats for life than previously thought.

Extremophiles



▲ Thermophiles, kinds of extremophile micro-organisms, inhabit the Grand Prismatic Spring in Yellowstone National Park.

Some micro-organisms can survive in extreme environments. Known as extremophiles, they thrive in very hot, cold or acidic conditions. Endoliths, for example, live in the microscopic spaces within rocks. Extremophiles are capable of living in environments similar to those known to exist on other planets. Many scientists now believe that extremophiles, even if not present in our Solar System, may be common amid the vastness of the Universe.

FACTFILE

More than 800 exoplanets have so far been identified. The nearest is Alpha Centauri Bb, discovered in October 2012, which lies 4.37 light years from the Earth in the constellation of Centaurus.

The search for extraterrestrial life

Worlds where life might have developed, or which might continue to host life today, must have had (or still have) water in its liquid form. In the Solar System, Mars, Jupiter's moon Europa and Saturn's moons Titan and Enceladus are all worlds which scientists have suggested could meet this essential requirement.

If living things, or fossils of once-living things, were ever discovered elsewhere in the Solar System, they would certainly be far less complex than human beings. The search for extraterrestrial intelligence (SETI) means looking further afield in other solar systems elsewhere in the Milky Way Galaxy—or even other galaxies.

◀ To discover more about Europa's "ocean", a space probe could send a cryobot, a heated ice drill, down to its surface. This would then penetrate the ice by melting it. Once it reaches the water beneath the ice, it would start to transmit pictures and information back to Earth.

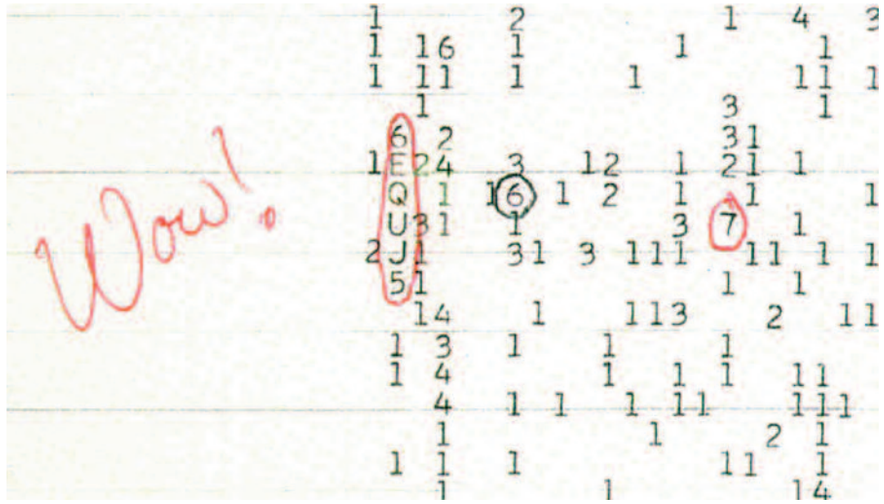
EXTRATERRESTRIAL LIFE

▲ Hat Creek Allen Telescope Array, the "Alien Telescope Array", California, USA. These radio telescope 6-metre dishes are used in the Search for Extraterrestrial Intelligence (SETI).

DRAKE'S EQUATION

In order to calculate the possible number of civilizations in the Galaxy, American astronomer Frank Drake (born 1930) proposed an equation. It took into account the potential number of Earth-like planets, along with the percentage of those that might have become sufficiently advanced to have developed communications. Drake arrived at a total of just 10.

The Wow! signal



On 15th August 1977, a radio signal lasting 72 seconds was detected by a radio telescope used in the SETI project. Struck by the possibility it might be of extraterrestrial origin, a scientist wrote "Wow!" next to the signal on the computer printout, so that became its name. Despite repeated efforts to locate it, it has not been detected since.

▲ The computer printout with the word "Wow!" written on it

First published in 2016 by Orpheus Books Ltd.,
6 Church Green, Witney, Oxfordshire, OX28 4AW, England
www.orpheusbooks.com

Created and produced by Nicholas Harris, Sarah Hartley and
Katie Sexton, Orpheus Books Ltd.

Text Nicholas Harris

Consultant David Hawksett, astronomer, writer and broadcaster

Illustrated by Sebastian Quigley (Linden Artists),
Mark Stacey and Gary Hincks

ISBN 978 1 7418 3743 8

Printed and bound in China

Photograph acknowledgements NASA/JPL/Caltech