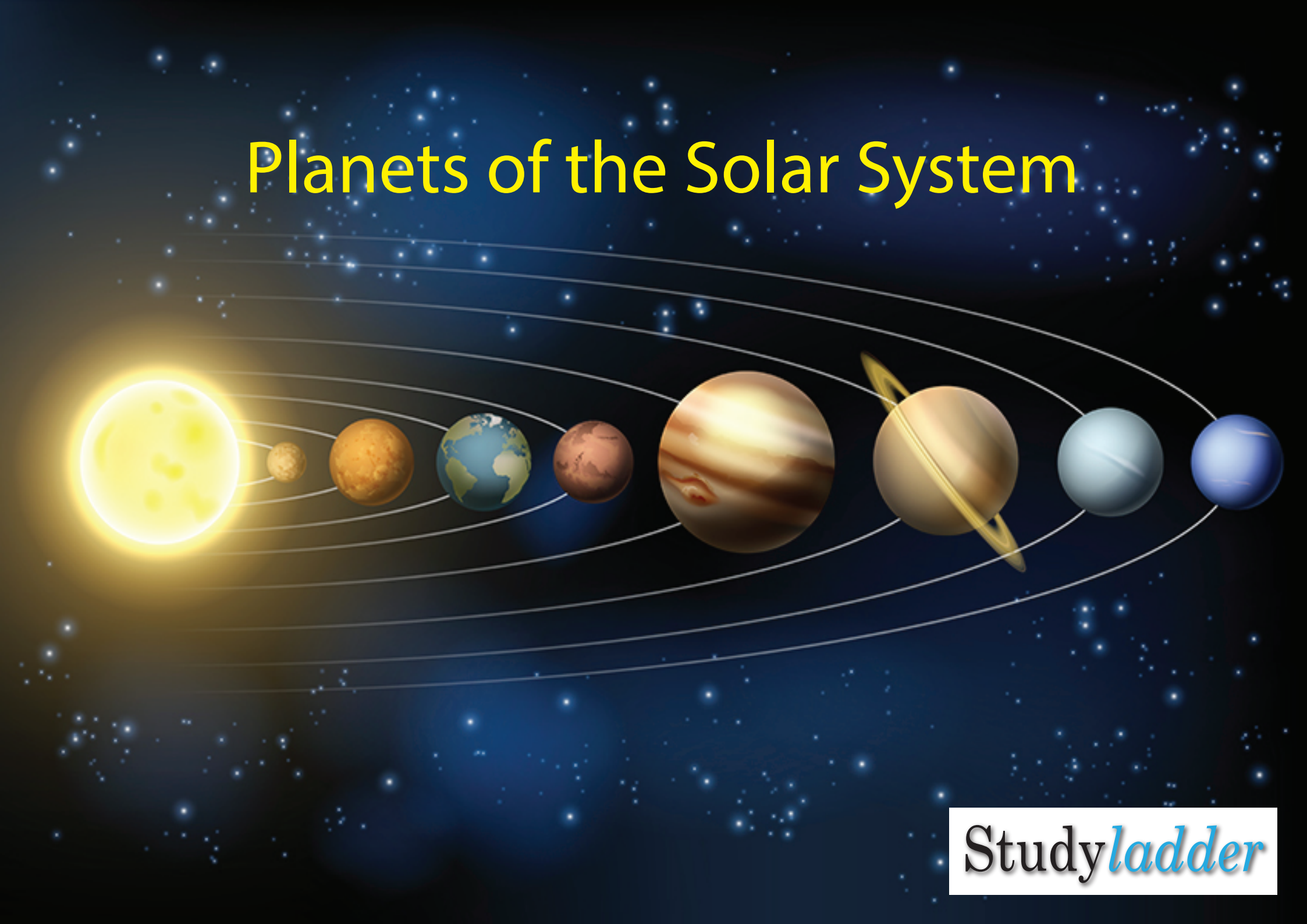
Planets of the Solar System



Studyladder

Mercury

Mercury is the smallest planet and the closest to the Sun. It travels very fast at a speed of 180 000 km/h in an elliptical orbit around the Sun. One orbit takes just 88 days. Mercury has the most eccentric orbit of all the planets, therefore its nearness to the Sun is variable. It can be as close as 47 million km and as far as 70 million km away, but is at an average distance of 57 910 000 km away from the Sun.

With a diameter of 4 800km, Mercury is about 38% of the size of the Earth. Even though it is revolving very quickly around the sun it is rotating very slowly on its axis. One day on Mercury takes 59 Earth days. In the time it takes to complete two orbits Mercury only rotates three times!

Average temperatures on Mercury reach 427°C during the day and -173°C during the night. Mercury has no atmosphere to trap and store heat so it is very cold on the side of the planet that is facing away from the Sun.

Where did Mercury get its name?

Mercury is named after the mythical Roman Messenger of the Gods. He is often depicted in art wearing winged sandles and a winged helmet. He was known for his speed.

Venus

Venus is the second closest planet at approximately 108 200 000 km away from the Sun. It is often referred to as our 'sister planet' because it has some similarities with Earth:

- It has a rocky surface dominated by volcanoes.
- It is of a similar size to Earth being 12 100 km in diameter compared to Earth's 12 742 km.
- Like Earth, Venus has a thick atmosphere. However, it is made up of a toxic mix of carbon dioxide and sulfur dioxide instead of the life supporting mix of nitrogen, oxygen and ozone that surrounds Earth.

Venus is closer to the Sun so it takes just 225 Earth days to orbit once around the Sun. Venus also rotates on its axis but does so very slowly and in the opposite direction to most of the other planets. One day and night on Venus lasts for 117 Earth days!

Venus is a hot planet, averaging 462°C on its surface. There is little variation in temperature as the thick atmosphere acts like a greenhouse, trapping the heat of the Sun.

Where did Venus get its name?

Venus is named after the Roman Goddess of love and beauty. Of the five planets known to ancient astronomers, Venus is the brightest 'star' that can be seen in the sky at night.

Earth

Earth is situated 149 600 000 km away from the Sun. It has one moon that circles the planet.

Our orbit is elliptical and takes 365.25 days (one year) to complete. Our Earth also spins on its tilted axis once every day. It takes 24 hours to complete the day/night cycle.

The diameter of Earth is 12 750 km. The surface of our planet is made up of rocky continental plates which shift slowly over time. A large proportion (71%) of our planet is covered by oceans.

Earth's atmosphere is a mixture of gases, mainly oxygen, nitrogen and ozone. The atmosphere protects us from damaging rays of the sun and insulates our planet, keeping temperatures at levels that can support life.

Where did Earth get its name?

The Earth is the only planet that is not named after a Roman or Greek god or goddess of mythology. The name means ground or soil.

Mars

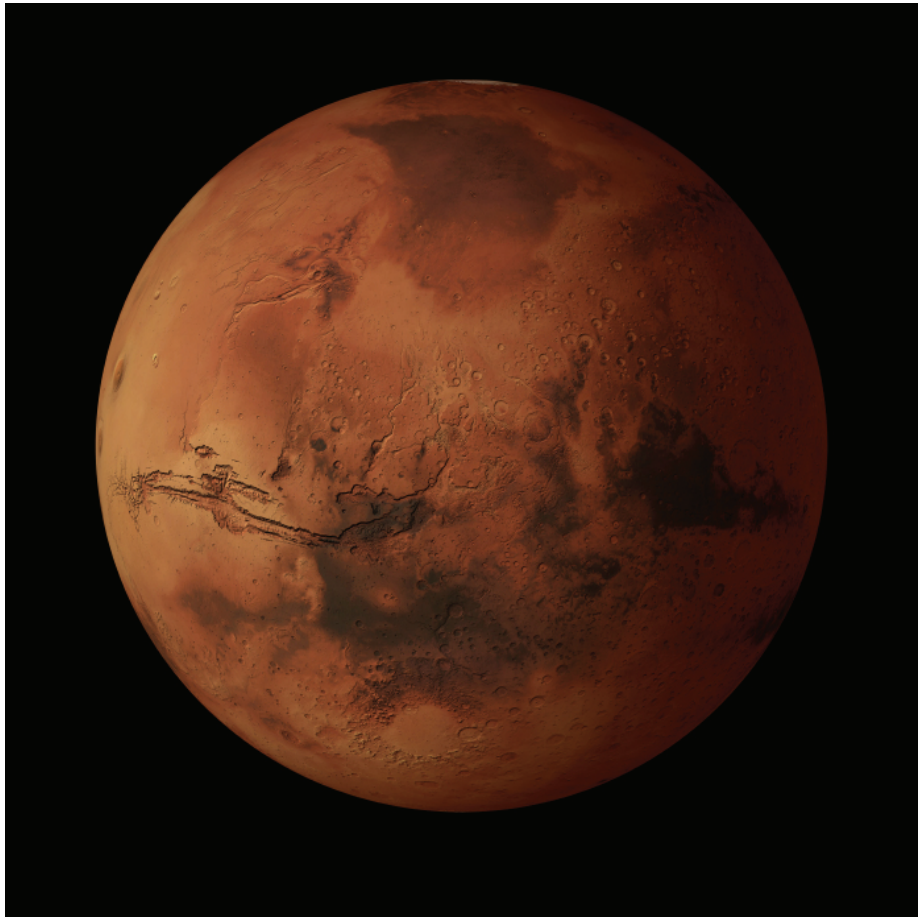
Mars is known as the 'red planet' because of the high iron content in the rocks on its surface.

Mars travels in an orbit that is about 227 940 000 km (on average) away from the Sun. The orbit of Mars is eccentric which means that this distance will vary. It can be as close as 206 655 215 km and as far as 249 232 432 km away from the Sun. It takes about 687 Earth days for Mars to complete one orbit.

Mars has a diameter of 6 800 km and is spinning at a rate of 868 km/h. A day and night cycle on Mars is about the same length as ours (just 40 minutes longer.)

There is a thin atmosphere surrounding the planet consisting mainly of carbon dioxide. Dust storms develop easily with strong winds that can affect the whole planet for months at a time.

The average temperature on Mars is about -67°C. Scientists have found evidence of water ice and carbon dioxide ice in the poles where temperatures can reach -125°C. Recent evidence also suggests that liquid water exists at times on Mars' surface.



Where did Mars get its name?

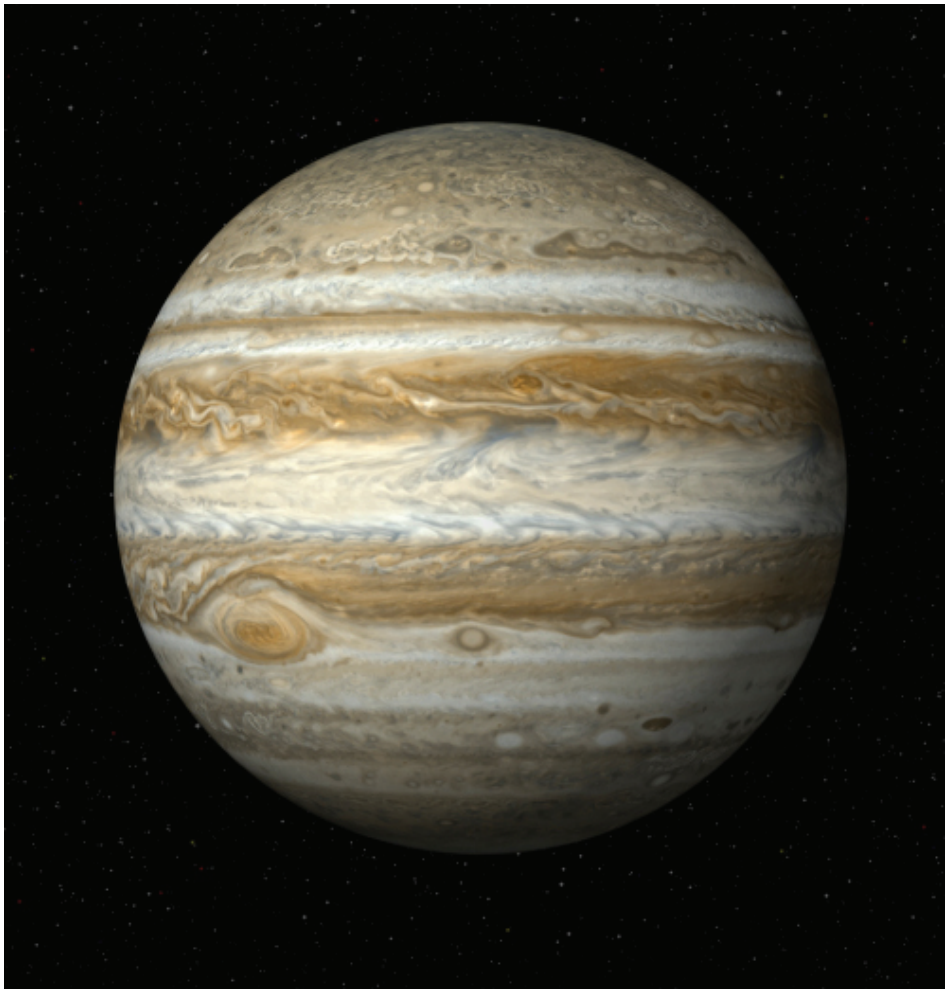
Mars is named after the Roman god of war. Mars has two small, irregularly shaped moons named Phobos (which means 'fear') and Deimos (which means 'panic'.) They were discovered in 1877 by American astronomer Asaph Hall. Phobos and Deimos were the horses that pulled the chariot of Ares, the Greek god of war.

Jupiter

Jupiter is one of the two Gas Giants in our solar system. It is the largest of all the planets, with a diameter of 142 800 km. It takes 11.9 Earth years to complete one revolution around the sun. Jupiter has the fastest spin of all the planets. It rotates once every 10 hours and its swirling core is almost as hot as the sun. This is why Jupiter has the strongest magnetic field out of all the planets.

Jupiter's atmosphere is mainly made up of hydrogen and helium. It has sixty seven named moons (as of Jan 2016.) The four largest moons, called Io, Europa, Ganymede and Callisto were discovered by Galileo Gallilei in 1610 with the newly invented telescope. Ganymede, Jupiter's largest moon, is bigger than Mercury.

Jupiter's most striking features are its swirling red spot which is shaped like an eye and its cloud systems that circulate the planet in bands. These clouds are constantly moving by winds of 100 m/s and the different hues are thought to be caused by variations in chemical composition of the clouds. The red eye appears to be a hurricane that has been spinning for more than 150 years. Recently, however, scientists have noticed that it has been getting smaller.



Where did Jupiter get its name?

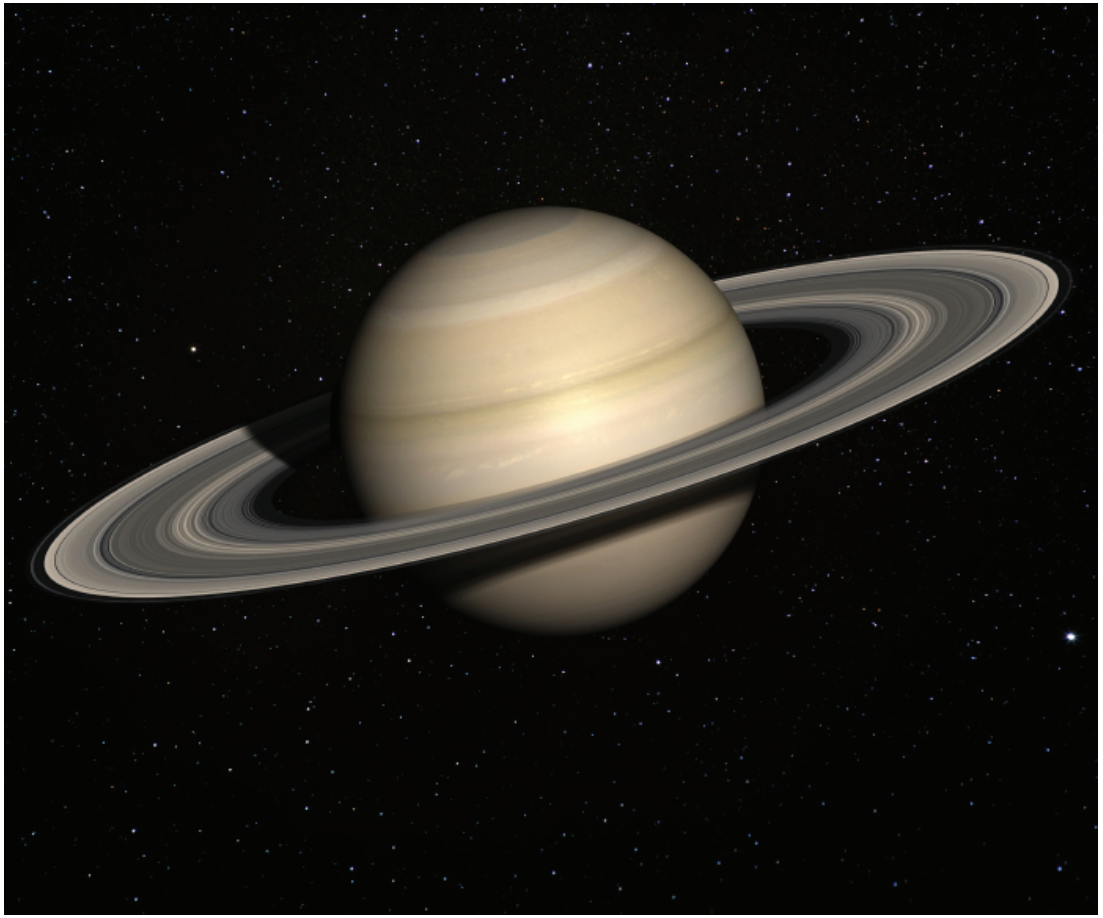
Being the largest planet in the solar system, Jupiter is aptly named after the king of the gods in Roman mythology. (Zeus in Greek mythology.) Jupiter's four largest moons are named after Greek mythological characters associated with Zeus.

Saturn

Saturn is the second largest planet with a diameter of 120 660 km. It is situated approximately 1 424 600 000 km away from the Sun. Saturn completes one day and night cycle in 10.7 hours and its orbit around the Sun takes about 29.5 Earth years.

Saturn is one of the two Gas Giants in the solar system. Its atmosphere is mainly made of hydrogen and helium. Other elements that are present include methane and water ice.

Saturn's most distinct feature is the rings of ice particles that orbits around it. Also orbiting around the planet are 62 officially named moons. The largest, Titan, was discovered by Christiaan Huygens in 1655. Like Ganymede, Jupiter's largest moon, Titan is bigger than Mercury. The next four moons were discovered by Giovanni Cassini: Iapetus in 1671, Rhea in 1672, Dione in 1684 and Tethys in 1689. William Herschel discovered two more large moons in 1789: Enceladus and Mimas.



Where did Saturn get its name?

Saturn is named after Saternus the Roman god of agriculture and harvest. Some of Saturn's moons are named after characters from Greek mythology: seventeen of them are named after Titans, a race of immortal giants.

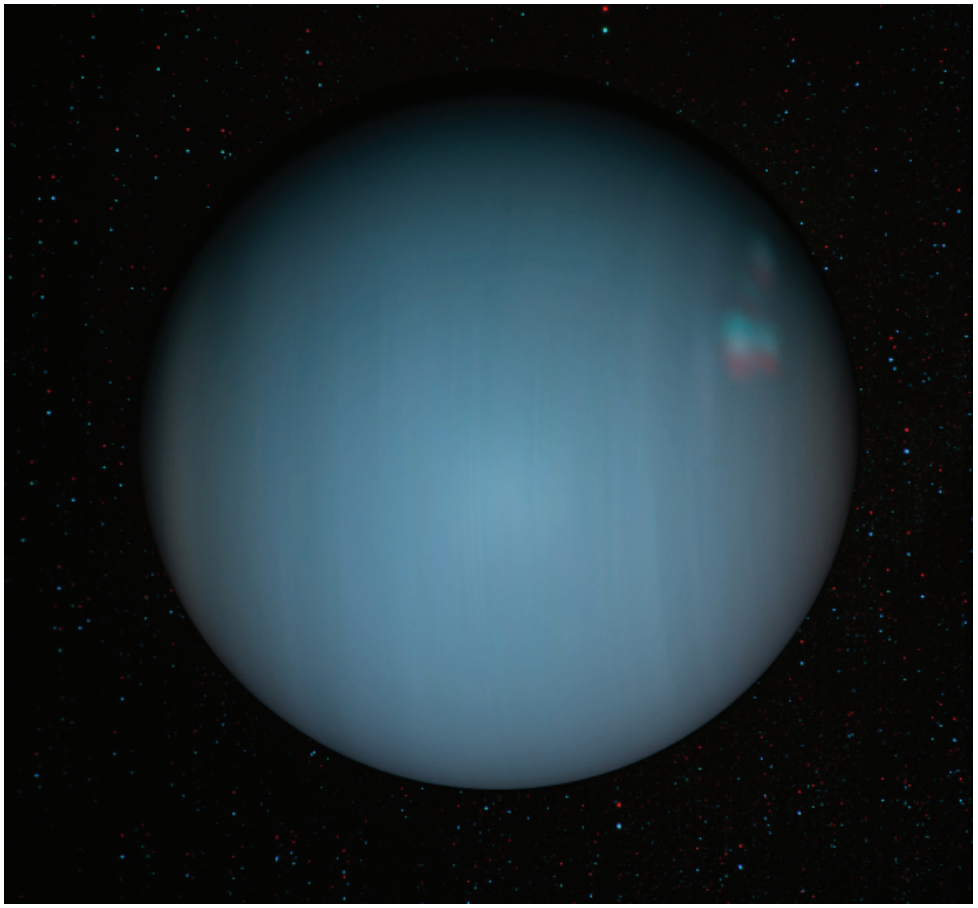
Uranus

Uranus is the third largest planet with a diameter of 51 800 km. It has the second largest orbit of all the planets, staying an average distance of 2 873 550 000 km away from the Sun. It takes 84.4 Earth years to orbit once around the Sun.

Like Venus, Uranus rotates in the opposite direction to the other planets. Scientists think that a collision early in the formation of the solar system may have led to a change in its rotation. A day on Uranus is equal to about 17 hours.

Interestingly, Uranus spins on an almost horizontal axis so the poles of the planet face the Sun continuously for 42 years before facing away from the Sun for another 42 years.

Uranus is the coldest planet with an average surface temperature of -197.2 °C. The planet is primarily made up of the gases hydrogen and helium and like the other Gas Giants, it lacks a solid surface. The layers of Uranus' atmosphere are icy, which is why it is referred to as an Ice Giant. The blue colour we see is due to the presence of methane. Icy winds can create large swirling dark spots on the surface of the planet.



Where did Uranus get its name?

Uranus was discovered by William Herschel in 1781. It was named after the Greek god of the sky. Uranus has 27 moons. The five largest are named Miranda, Ariel, Umbriel, Oberon and Titania. The moons of Uranus were named after characters in classic literature rather than Greek or Roman mythology.

Neptune

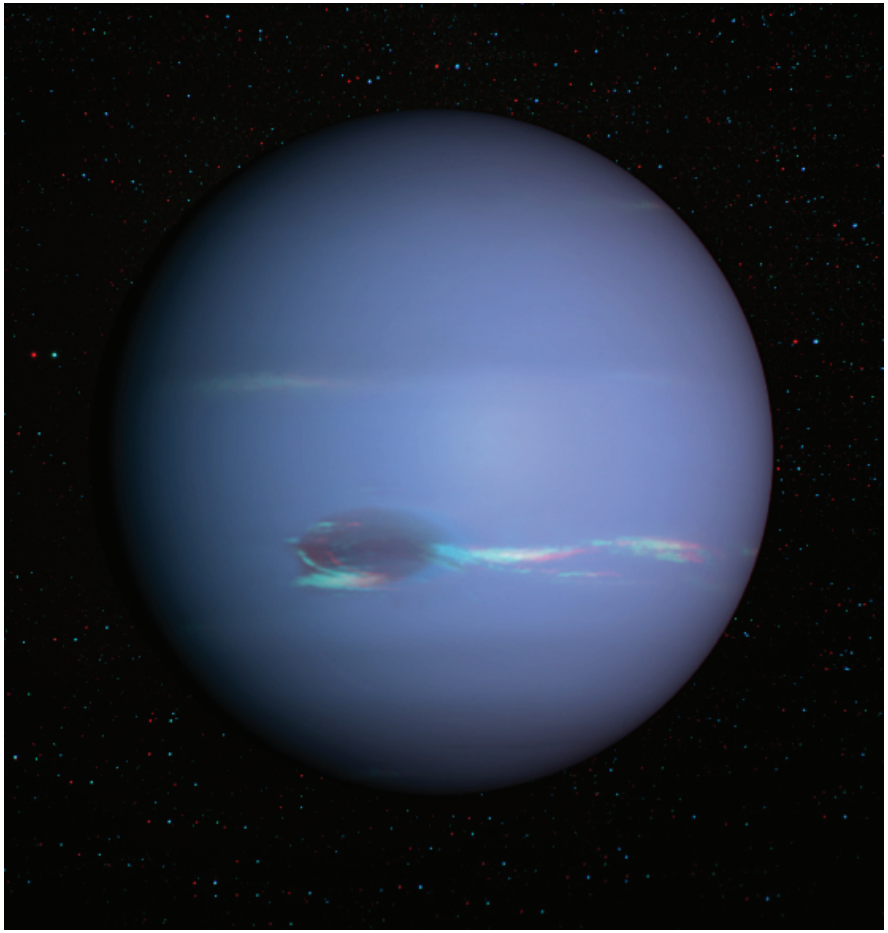
Neptune is the most distant of all the planets, situated some 4 501 000 000 km away from the Sun. Its orbit takes 165 Earth years to complete and it takes about 16 hours to rotate once on its axis.

Neptune is the fourth largest planet in our solar system, with a diameter of 49 500 km. Being an Ice Giant, the composition of the planet is presumed to be mostly hydrogen and helium around an ice and rock core. Its atmosphere also contains methane which is thought to give the planet its blue colour.

Winds on Neptune can reach speeds of up to 2000 km/hour and it is believed that these cause the swirling dark spots that appear on the surface of the planet.

Neptune, like all the Gas Giants has rings. However, they are not as noticeable as the rings of Saturn.

Neptune has 14 known moons. The largest, named Triton was discovered by William Lassell in 1846. It is as big as the dwarf planet Pluto. Many of Neptune's moons are icy. The Voyager 2 spacecraft photographed ice volcanoes on the surface of Triton in 1989.



Where did Neptune get its name?

Neptune was named after the Roman god of the sea. (The Greek god is Poseidon.) It is an apt name for such an icy blue planet!

How big are the planets of the solar system compared to the Sun?

The models in this illustration represent the comparative sizes of the planets in our solar system. Even our largest planet, Jupiter, is dwarfed by the massive size of the Sun.