

## MERCURY

Mercury is the closest planet to the Sun and smallest of the terrestrial planets. It barely has an atmosphere, which is only a little more substantial than a vacuum. Sunlight heats up the surface of the planet to high temperatures during the day, up to 840 degrees F. At night, the surface cools off rapidly, and the temperatures can drop down to -300 degree F. This daily temperature variation is the largest of all of the planets.

Mercury's day is much longer than Earth's. Due to Mercury's closeness to the Sun and its slow rotation, the length of one day on Mercury is equal to 176 Earth days; that is, the time from one sunrise to another on the surface of Mercury is 176 Earth days (while on Earth, this is equal to one day, or 24 hours.)

The core of Mercury is mostly iron, surrounding by rocky material. The surface is covered with craters and cliffs, with some flat plains.

Source: space.com, [www.usra.edu](http://www.usra.edu)

## VENUS

Venus, a near twin in size to the Earth, has a very thick atmosphere composed of primarily carbon dioxide gas. The thick carbon dioxide atmosphere traps heat from the Sun during the day and does not let the surface cool at night; as a result, temperatures on the Venusian surface are over 867 degrees F. The high temperature and unbreathable thick atmosphere would make the planet very inhospitable to human visitors. None of the robotic spacecraft (called Venera) sent to land on the planet's surface by the Soviet Union in the 1970s and 1980s were known to last more than a little over two hours under the harsh Venusian conditions.

The surface of Venus is extremely dry. There is no liquid water on its surface today because the scorching heat created by its ozone-filled atmosphere would cause any to boil away. Roughly 2/3 of the Venusian surface is covered by flat, smooth plains, marred by thousands of volcanoes, some of which are still active today, with lava flowing in long, winding canals. There are also 6 mountain ranges.

Source: space.com, [www.usra.edu](http://www.usra.edu)

## **EARTH**

Earth is humanity's home planet. Most of its surface (over 70%) is covered with oceans, with the rest featuring a wide variety of land forms, from mountains and valleys to plains and beaches. Earth has a thick atmosphere, which is mostly nitrogen (78%) and oxygen (21%), with other gases such as argon, carbon dioxide, and water present in small amounts. The region on and near the surface of Earth (both above and below ground) is filled with life. The presence of liquid water on the planet's surface and the existence of life make the Earth a unique object in the Solar System. Whether life could and does exist outside of Earth is the subject of study through the science of astrobiology.

Source: [space.com](http://space.com), [www.usra.edu](http://www.usra.edu)

## **MARS**

Mars is about half the size of Earth in diameter. This makes the surface of Mars equal in area to all the land area on Earth. Mars has a carbon dioxide atmosphere, but it is extremely thin, only about one percent as thick as Earth's atmosphere. The thin air does not retain heat well, and surface temperatures range from a frigid -130oC (-200oF) on a cold winter night to 27oC (80oF) at the equator on a hot summer day. Mars has polar ice caps, made of water ice and carbon dioxide ice. There may be ice under the surface of Mars at lower latitudes, as well. The Martian surface has features that look like dry streambeds, leading many researchers to surmise that at some time in the distant past, Mars may have had liquid water flowing on its surface.

Source: [space.com](http://space.com), [www.usra.edu](http://www.usra.edu)

## JUPITER

Jupiter is the largest planet in the Solar System. It is about 318 times as massive as Earth, and over 1,300 Earths could fit inside of it. In fact, if Jupiter was about 75 times as massive as it is, it would have become a star in its own right, and the Solar System would have been a double star system.

Jupiter has no solid surface, except for a small core of rock and iron. Its atmosphere is made up of mostly hydrogen gas and helium gas, just like the sun. The planet's surface is covered in thick red, brown, yellow and white clouds. Like all Jovian (outer) planets, Jupiter's surface shows complicated wind patterns. Perhaps the most recognizable feature on Jupiter's surface is the Great Red Spot, a huge storm, twice the diameter of Earth, which has been raging for at least 300 years.

Jupiter has three thin rings. The rings were discovered in 1979 by NASA's Voyager 1 spacecraft. Jupiter's rings are made up mostly of tiny dust particles.

Source: [space.com](http://space.com), [www.usra.edu](http://www.usra.edu)

## SATURN

Saturn is just a little smaller than Jupiter (its diameter is about 85% of Jupiter's) but a lot lighter (its mass is about a third of Jupiter's). This means that it has a very low density. In fact, its density is the lowest of all the planets and less than the density of water. This leads to the popular description that in a bathtub filled with water (assuming the tub is big enough to hold a planet) Saturn would float. Still, in composition and internal structure, the planet is thought to be fairly similar to its larger sibling, Jupiter, with a gas surface and strong winds.

Perhaps Saturn's most striking property is its exquisite ring system. All Jovian planets are surrounded by a complex ring system made of icy particles. Saturn's ring system is, by far, the most beautiful—an extensive, complex system of billions of tiny particles orbiting the planet above its equator. The rings of the other Jovian planets are much thinner and fainter. Scientists are still trying to determine the origin of the ring particles; the most commonly accepted suggestion is that they are bits of dust blown off the planets' moons by asteroid or meteoroid impacts.

Source: [space.com](http://space.com), [www.usra.edu](http://www.usra.edu)

## URANUS

Uranus's unique feature is that it appears to have been knocked over sometime in the past. Most planets orbit around the Sun spinning upright; that is, their rotational axes are almost perpendicular with respect to their orbit (with small deviations, like the Earth's 23.5° tilt).

Uranus's rotation axis, however, is almost lying within its orbital plane. The cause of this unique feature is not certain, but it has been suggested that it was caused by an impact of a large object, such as a large asteroid or moon. Giant impacts like this were common during the early history of the Solar System; a similar impact is thought to have created the Earth's Moon.

Uranus is a gas planet, with a rocky inner core surrounded by a vast ocean of water mixed with rocky material. Like all gas giants, Uranus carries a set of rocky rings around its equator. The thin strips, most only a few miles wide, are made up of tiny bits of rock and ice smaller than a meter. The planet has at least 13 known rings in two systems.

Source: [space.com](http://space.com), [www.usra.edu](http://www.usra.edu)

## NEPTUNE

The first layer of Neptune is its icy atmosphere, which is mostly hydrogen and helium. The bluish coloration comes from traces of methane in the air, but the planet is a more brilliant hue than the dull blue of Uranus, which implies something else could be affecting it. The enormous distance to the sun keeps temperatures low.

Like Earth, Neptune has a rocky core made up of iron and other metals, with a mass just greater than our planet.

Neptune is similar in size to Uranus (and both are smaller than Jupiter and Saturn). Giant storm centers can be seen on its visible surface, similar to those on the other outer planets. The atmosphere features great wind patterns; its winds are the fastest in the Solar System, reaching speeds of 1,200 miles/hour. When the Voyager 2 spacecraft (the only spacecraft to visit this remote planet) flew by in 1989, one of the most distinguishing features of the planet was the Great Dark Spot, a storm similar to Jupiter's Great Red Spot (but only about half its size). Later observations of the planet made with the Hubble Space Telescope showed the Spot to have disappeared (or masked by other atmospheric phenomena), and follow-up observations revealed the appearance of another dark spot elsewhere. All these features indicate that Neptune has a very active and rapidly changing atmosphere.

Source: [space.com](http://space.com), [www.usra.edu](http://www.usra.edu)