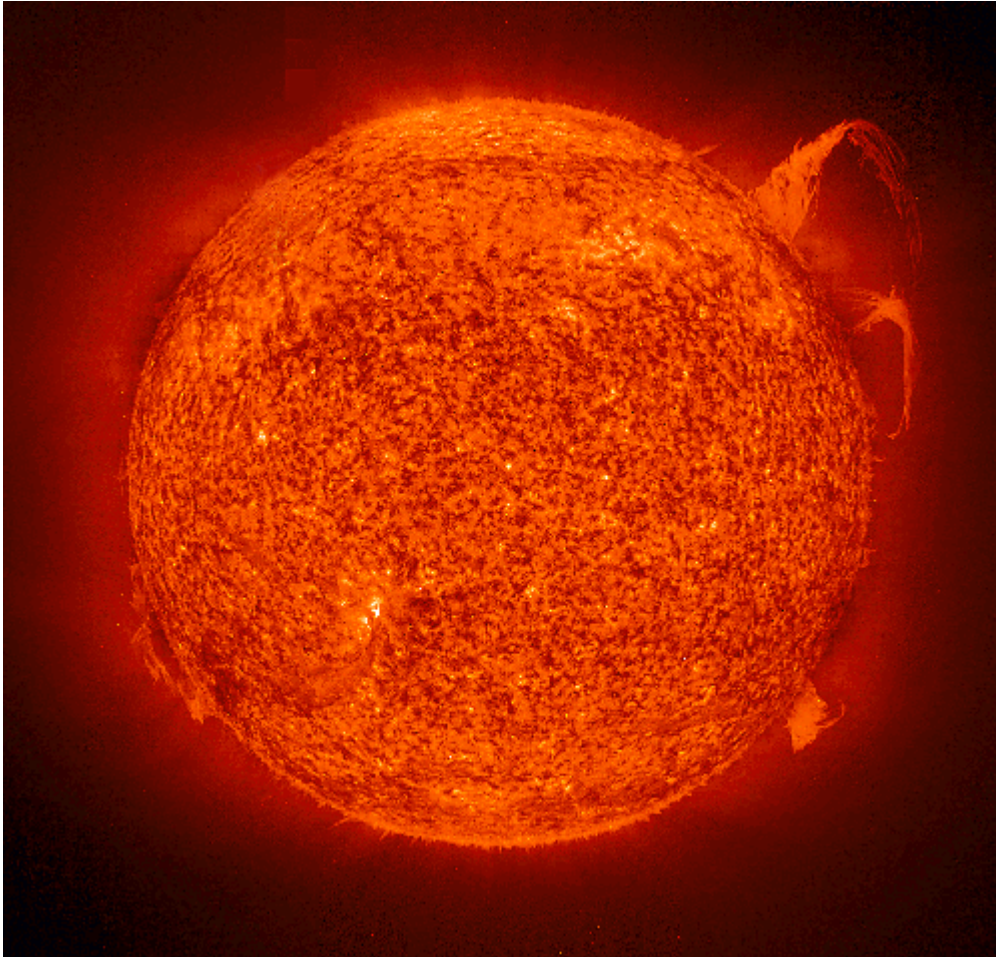


The Sun



SOHO / ESA / NASA

Size: About 109 Earths would fit side-by-side across the face of the Sun! One million Earths could fit inside the Sun. One large sunspot could hold several Earths. The Sun's diameter is 864,000 miles (1.4 million kilometers).

Distance from Earth: The Sun is about 93 million miles (150 million km) away from Earth.

Rotation: The Sun spins on its axis from east to west. Its equatorial zone rotate once every 24 days approximately, while its polar regions take over 30 days to rotate once.

Surface: Heat, deep inside the Sun, rises from the radiative zone through the convective zone until it bubbles at the surface, the photosphere. At the photosphere, things cool a bit and the gas begins

to sink back down through the convective zone. When gas reaches the radiative zone, it heats up and the whole process starts over again.

The photosphere is the layer that holds sunspots. The photosphere is churning and boiling like a thick pot of chili or oatmeal. Although sunspots are very hot, they are slightly cooler than the rest of the photosphere, so they look darker. Sunspots have a dark center called an umbra and a lighter ring around the outside called the penumbra.

It takes 50 million years for the energy formed deep inside the Sun to reach Earth.

Earth only gets one-billionth of the total energy produced by the Sun.

Atmosphere: The Sun's outer atmosphere is called the corona, and its inner atmosphere is called the chromosphere.

Temperature: The temperature at the Sun's core is 15 million kelvins.

Other information: The Sun formed about 5 billion years ago from a huge cloud of gas and dust. The Sun is an average-size, middle-aged star.

The Sun's core converts 700 million tons of hydrogen gas into 695 million tons of helium gas every second. The remaining 5 million tons of matter are converted to an amount of pure energy that's about six hundred times greater than the amount of water flowing over Niagara Falls produces in one second.

Light, traveling at 186,000 miles (300,000 km) per second, takes just over 8 minutes to reach Earth from the Sun.

In both Greek and Roman mythology, Apollo is the god of the Sun. He brought life-giving heat and light to Earth and was the patron god of musicians and poets.

Mercury



NASA

Size: Mercury is about 3,032 miles (4,880 kilometers) across. That makes it the second-smallest planet in the solar system; only Pluto is smaller. In fact, Mercury is just a little larger than Earth's Moon.

Distance from the Sun: Mercury is the closest planet to our star, with its average distance from the Sun being 36 million miles (58 million km).

Orbit around the Sun: Because Mercury is so close to the Sun, it has the smallest orbit of all the planets. Mercury's year (the time it takes to orbit the Sun one time) is 88 Earth days long.

Rotation: Although Mercury goes around the Sun quickly, it spins very slowly on its axis — about 59 Earth days for every rotation.

Surface: Scientists believe that Mercury has a thin, rocky crust, with a large metallic core, probably made of iron, at its center. Mercury is covered with craters and has ice at its poles.

Atmosphere: Mercury has an extremely thin atmosphere of helium and hydrogen captured from the

solar wind.

Temperature: On Mercury, you would either freeze or roast. The highest surface temperature is 870° F (466° C), while the lowest temperature is –300 °F (–184 °C).

Escape velocity: To escape Mercury's gravity, you have to travel 9,600 miles (15,500 km) per hour, compared to 25,000 miles (40,200 km) per hour necessary to escape Earth's gravity.

Other information: The Mariner 10 spacecraft flybys of Mercury in the 1974-1975 greatly enhanced our knowledge of the planet.

Because it moves so fast around the Sun, early Roman skywatchers named Mercury after their speedy messenger god. To the ancient Greeks, Mercury is identified with the god Hermes.

Venus



NASA

Size: Venus is about 7,521 miles (12,104 kilometers) in diameter.

Distance from the Sun: The second planet from our star has an average distance from the Sun of 67 million miles (108 million km).

Orbit around the Sun: It takes 225 Earth days for Venus to go around the Sun one time.

Rotation: Venus spins on its axis once every 243 Earth days, but it spins in the opposite direction of Earth. On Venus, the Sun rises in the west and sets in the east.

Surface: The surface of Venus is covered with craters, mountains, volcanoes, and lava plains. Maxwell Montes is the highest point on Venus. It is more than 7 miles (11 km) high.

Atmosphere: Possessing sulfuric acid clouds, the atmosphere of Venus is mostly carbon dioxide (96 percent), nitrogen (3.5 percent), and carbon monoxide, argon, sulfur dioxide, and water vapor (all less than 1 percent). The atmosphere is so thick and heavy that it bends light, making the ground appear to curve upward in all directions. The planet's atmosphere is ninety times heavier than Earth's.

Temperature: Venus's surface temperature can get close to 900° F (482° C), hot enough to melt lead. This makes Venus the hottest place in the solar system after the Sun.

Escape velocity: To escape Venus's gravity, you have to travel 23,300 miles (37,500 km) per hour, compared to 25,000 miles (40,200 km) per hour necessary to escape Earth's gravity.

Other information: After the Sun and Moon, Venus is the brightest object in the sky. Because its thick clouds reflect most of the light Venus gets from the Sun, the planet looks like a very bright star in the morning (just before sunrise) or evening (just after sunset) sky.

Sometimes called Earth's sister planet, Venus is slightly smaller than Earth. It's also our closest neighbor, approaching within 25 million miles (40 million km).

In Roman mythology, Venus was identified with the goddess of love and beauty, Aphrodite. To the ancient Mayans, Venus was the patron planet of warfare called Kukulcan, or the feathered serpent.

Earth



NASA Goddard Space Flight Center

Size: Earth has a diameter of 7,926 miles (12,756 kilometers).

Distance from the Sun: Earth is the third planet from the Sun, which is about 93 million miles (150 million km) away.

Orbit around the Sun: Earth goes around the Sun in 365 and 1/4 days. Every 4 years, the extra quarters add up to one whole day and we add a day to the end of February, creating a leap year.

Rotation: It takes only 23 hours, 56 minutes (1 day) for Earth to spin on its axis one time relative to the stars.

Surface: From space, Earth looks like the blue water world it is. About 70 percent of Earth's surface is covered with water, and 97 percent of all that water is in the salty oceans. Only 3 percent of Earth's water is freshwater — the water we drink.

Earth is covered with mountains, volcanoes, lakes, rivers, and oceans. Most of the surface material is made of rocks — high in silica, iron, and magnesium.

Atmosphere: Earth's atmosphere is a mixture of gasses that becomes thinner as we move away from the planet toward space. Most of the atmosphere is nitrogen (78 percent), oxygen (21 percent), argon, and other gases (1 percent).

Some of the oxygen in Earth's atmosphere has changed over time to form ozone. Earth's high ozone layer filters out the Sun's harmful ultraviolet rays, protecting the living beings on the surface. Ozone at ground level, however is an irritant to eyes, nose, and throats.

Temperature: Earth's average temperature is 60° F (15.5° C).

Escape velocity: To escape Earth's gravity, you have to travel 25,000 miles (40,200 km) per hour.

Other information: The highest point on Earth's surface is Mount Everest on the border of Nepal and China, at 29,035 feet (8,850 meters).

The deepest known point in Earth's oceans is over 36,000 feet (11,000 meters) deep in the Marianas Trench in the Pacific Ocean.

The Moon



Gregory Terrance

Size: With a diameter of 2,159 miles (3,475 kilometers), the Moon is just one-quarter the size of Earth.

Distance from Earth: The Moon's average distance from Earth is 238,000 miles (383,500 km).

Orbit around Earth: It takes the Moon 27.3 Earth days to revolve around our planet one time.

Rotation: The Moon spins on its axis once every 27.3 Earth days.

Surface: The Moon's surface is covered with craters, mountain ranges, rilles (long narrow channels), and lava plains. The vast, dark regions we see on the Moon's surface are called maria, or seas. They are actually very large, smooth lava beds. The bright, light areas on the Moon's surface are called highlands.

The Moon is covered with a solid, rocky crust about 500 miles (800 km) thick.

Underneath the crust, scientists think there is a partially molten zone that leads to a small core of iron. Craters on the Moon come in a wide variety of sizes. The largest crater measures 1,600 miles (2,575 km) across, while the smallest is the size of a pinprick.

Atmosphere: The Moon has no long-lasting, significant atmosphere, so the footprints left by Apollo astronauts will last a long time.

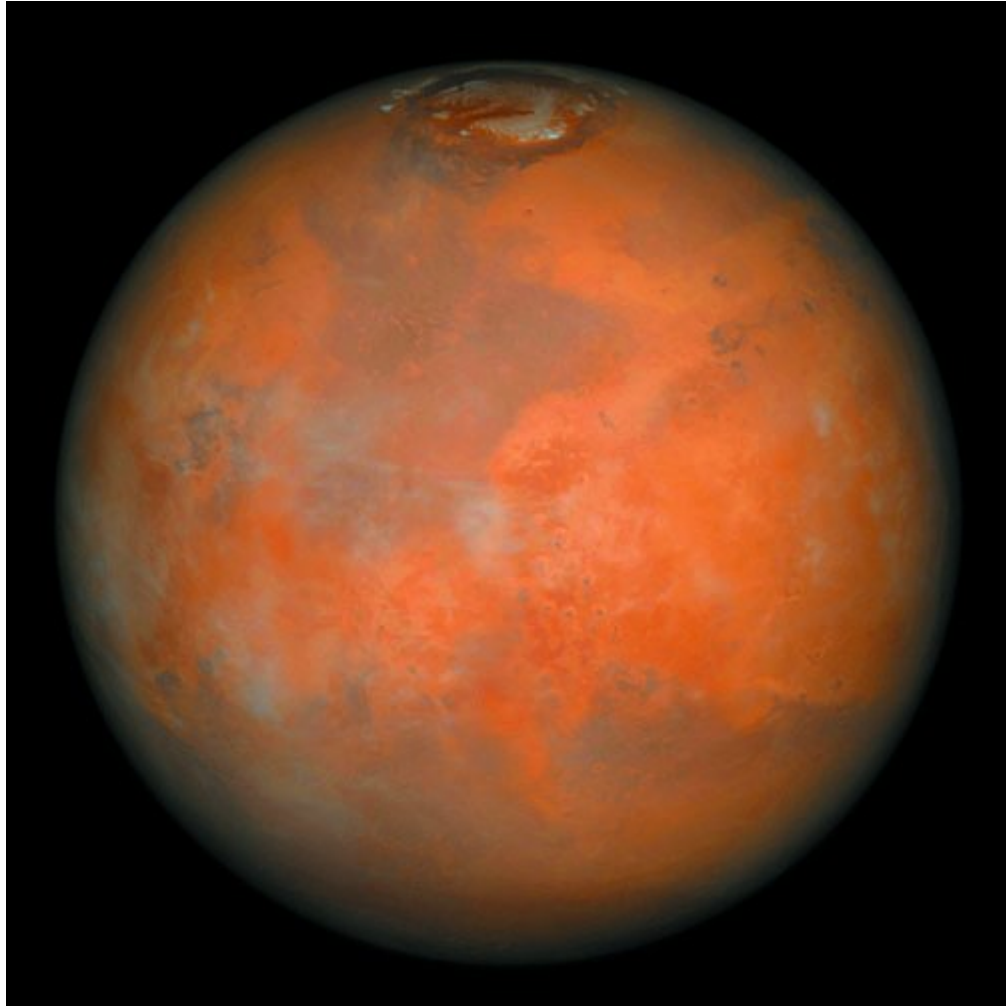
Temperature: The mean daytime temperature is 225° F (107° C), while the mean nighttime temperature is -243° (-153° C).

Escape velocity: To escape the Moon's gravity, you need to travel 5,200 miles (8,400 km) per hour, compared to 25,000 miles (40,200 km) per hour necessary to escape Earth's gravity. Earth's gravity is six times greater than the Moon's.

Other information: Roughly 842 pounds (382 kilograms) of Moon rock and soil were brought back to Earth aboard the Apollo spacecraft.

In Roman mythology, Diana (also known as Luna) was the goddess of the Moon. She was the twin sister of Apollo, the Sun god.

Mars



NASA / JPL

Size: Mars is about 4,212 miles (6,779 kilometers) in diameter.

Distance from the Sun: Mars is the fourth planet from the Sun and orbits roughly 142 million miles (229 million km) away.

Orbit around the Sun: It takes 687 Earth days for the Red Planet to go around the Sun one time.

Rotation: Mars spins on its axis at about the same speed as Earth does. It takes 24 hours and 37 minutes (about 1 Earth day) for Mars to rotate one time.

Surface: There are lots of dry channels on Mars, and they look like Earth's river channels. Most scientists believe water once flowed on the martian surface, but new studies suggest there still may be water in some places at and under the surface.

Mars has the largest canyon (Valles Marineris), and the highest volcano (Olympus Mons) in the solar system.

If Valles Marineris were on Earth, it would span the United States, from New York on the East Coast to California on the West Coast. The canyon is about 1,300 miles (2,100 km) long, 300 miles (500 km) wide, and about 5 miles (8 km) deep.

Olympus Mons is about three times higher than Mount Everest. It rises above the Martian surface 14 miles (22 km). This giant volcano's base is the size of the state of Missouri.

The planet's reddish color is caused by rust (iron oxide) in the soil.

The polar ice caps on Mars are made of frozen carbon dioxide, or dry ice, plus a seasonal coating of water ice.

Atmosphere: The martian atmosphere is very thin and made of carbon dioxide (95 percent), nitrogen (3 percent), argon and other gases (1 percent).

Temperature: The lowest surface temperature on Mars is -190°F (-123°C), while the hottest temperature is 90°F (32°C).

Escape velocity: To escape the gravity of Mars, you have to travel 11,200 miles (18,000 km) per hour, compared to 25,000 miles (40,200 km) per hour necessary to escape Earth's gravity.

Other information: Because the Red Planet's color reminded ancient astronomers of blood, they named the planet after their gods of war. Mars was the Roman god of war, while Ares was the Greek version.. The planet's two moons also have names that relate to war. Phobos means "fear," and Deimos means "panic." Phobos is about 17 miles (27 km) in diameter and Deimos is about 9 miles (14 km).

Asteroids



The Galileo spacecraft captured this view of the asteroid Ida (left) and its moon, Dactyl (right), when it was 6,500 miles (10,500 kilometers). *NASA / JPL*

Composition: Asteroids are chunks of rock and metal that orbit the Sun. They can be different shapes and sizes.

Types: There are three major types of asteroids: C-Carbonaceous (comprised of ancient carbon silicates), S-Silicates (made of rocky silicates and iron), and M-Types (rich in metals, mostly nickel and iron).

Size: Asteroids can be as small as the size of a pebble. The largest known asteroid is Ceres, which is around 597 miles (960 kilometers) in diameter.

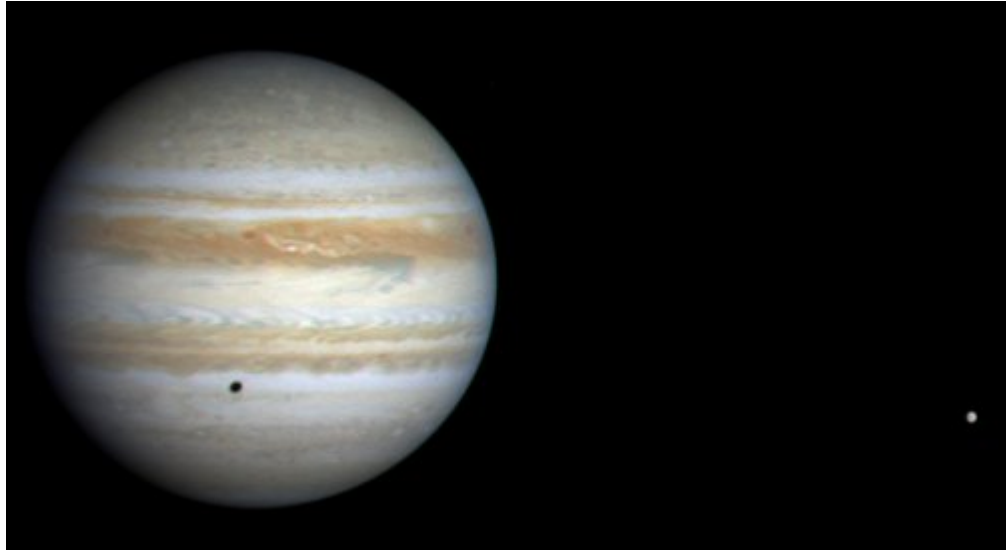
Location: The largest population of asteroids lies between the orbits of Mars and Jupiter. However, a significant amount of asteroids are found within the orbits of Mars, Earth, Venus, and Mercury. Less than 200 asteroids orbit close enough to Earth to be considered a threat. These bodies are known as near-Earth objects.

Number: There are over 10,000 identified bodies in the asteroid belt that are between 60 miles (100 km) and 600 miles (1,000 km) across.

Other information: Very large asteroids, often called minor bodies, are large enough that their own gravity shapes them into spheres. Ceres and Vesta are two such examples.

One possible explanation for the extinction of dinosaurs is that an asteroid hit Earth 65 million years ago. The theory holds that the impact brought catastrophic conditions, such as firestorms and light-blocking dust filling the atmosphere, that wiped out plant and animal life.

Jupiter



Casting a shadow onto Jupiter is one of its moons, Europa (far right). Some scientists believe this moon might have a liquid ocean beneath its surface. *NASA / JPL / University of Arizona*

Size: Eleven Earths would fit side by side across the face of Jupiter. It is the biggest planet in the solar system, and it has a diameter of 89,000 miles (143,000 kilometers).

Distance from the Sun: Jupiter is the fifth planet from the Sun. Its orbit is about 483 million miles (777 million km) away from the Sun. That's five times farther than Earth's orbit.

Orbit around the Sun: It takes Jupiter 12 Earth years to go around the Sun once. So on your twelfth birthday, Jupiter is in roughly the same place of the solar system as it was on the day you were born.

Rotation: Although Jupiter takes a long time to go around the Sun, it takes only 10 hours to spin on its axis one time. That's less than half the time it takes Earth to spin once.

Surface: Jupiter does not have solid surface — its gaseous material becomes denser with depth.

Atmosphere: Jupiter's atmosphere is made mostly of hydrogen (86 percent) and helium (14 percent). The colorful cloud bands we see are actually cloud layers. Darker clouds tend to be deeper in Jupiter's atmosphere, while the lighter or white clouds are higher. The atmosphere also has giant lightning storms in its upper clouds.

Temperature: The average temperature at the top of Jupiter's clouds is -244° F (-153° C).

Escape velocity: To escape Jupiter's gravity, you have to travel 133,100 miles (214,200 km) per hour, compared to 25,000 miles (40,200 km) per hour necessary to escape Earth's gravity.

Other information: The Great Red Spot on Jupiter can be seen through a small telescope. This gigantic storm would hold two Earths. The Red Spot has been around for almost 400 years.

Jupiter has 63 moons. The four largest moons, Ganymede, Io, Europa, and Callisto, are called the Galilean moons because Galileo first saw them in 1610.

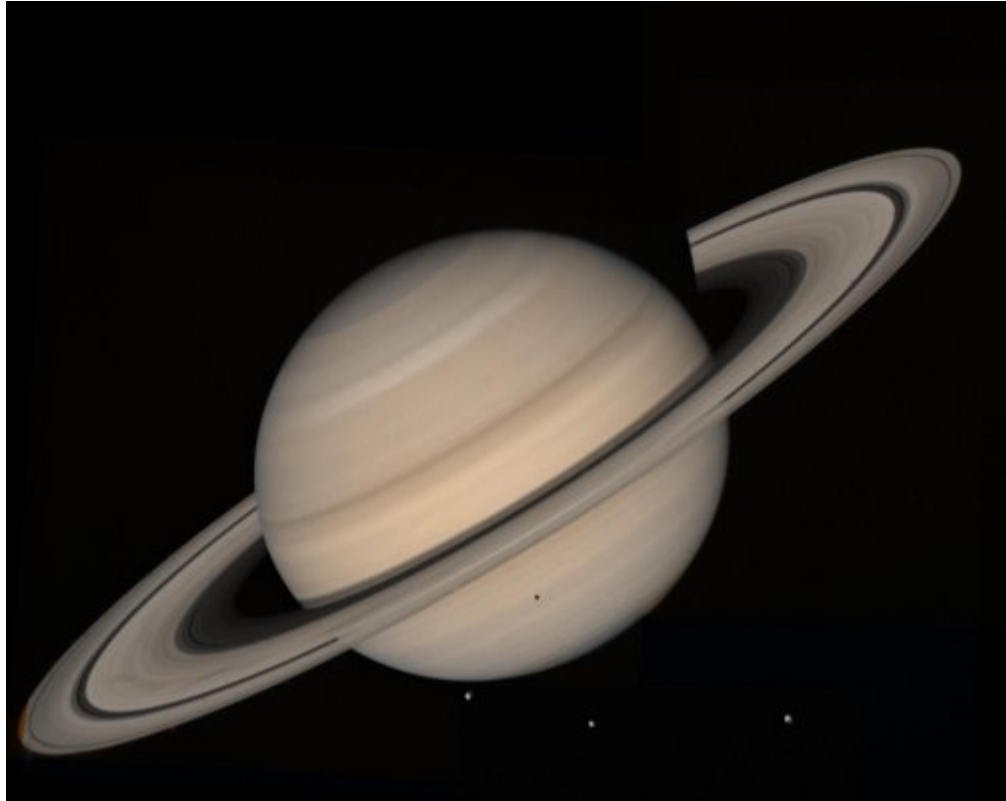
Jupiter has a "pizza moon." Sulfur-spewing volcanoes cover the surface of Io. At different temperatures, sulfur appears in different colors, making Io look like a giant pizza.

Jupiter gives off more energy (in the form of heat) than it gets from the Sun.

Jupiter has four thin, faint rings.

In Roman mythology, Jupiter was the king of the gods and lord of the sky — a fitting name for our largest planet.

Saturn



In this 1982 image from Voyager 2, Saturn is shown with three of its moon (from left to right): Tethys, Dion, and Rhea. *NASA / JPL*

Size: Saturn would hold 9 1/2 Earths spread across its face. It is the second-largest planet in the solar system and has a diameter of 74,900 miles (120,500 kilometers).

Distance from the Sun: Saturn is the sixth planet from the Sun, with an orbit roughly 888 million miles (1.43 billion km) away.

Orbit around the Sun: Saturn journeys 29.4 Earth years to go around the Sun once.

Rotation: It takes Saturn only 11 hours to spin on its axis one time.

Surface: Saturn does not have solid surface.

Atmosphere: The atmosphere of this ringed planet is like Jupiter's atmosphere. Saturn holds mostly hydrogen (97 percent) and helium (3 percent). Saturn also has beautiful bands like Jupiter, but these

colorful features are hidden by haze and smog that make up the planet's high atmosphere.

Temperature: The average temperature on Saturn is -300° F (-184° C).

Escape velocity: To escape Saturn's gravity, you need to travel 79,400 miles (127,800 km) per hour, compared to 25,000 miles (40,200 km) per hour necessary to escape Earth's gravity.

Other information: Saturn is also called the "ringed planet." Although Jupiter, Uranus, and Neptune also have ring systems, Saturn's is the largest. Saturn's rings are 169,800 miles (273,000 km) across, but only 10 to 100 yards (9 to 90 meters) thick. Saturn's rings are made of ice and rock particles, some as big as a minivan.

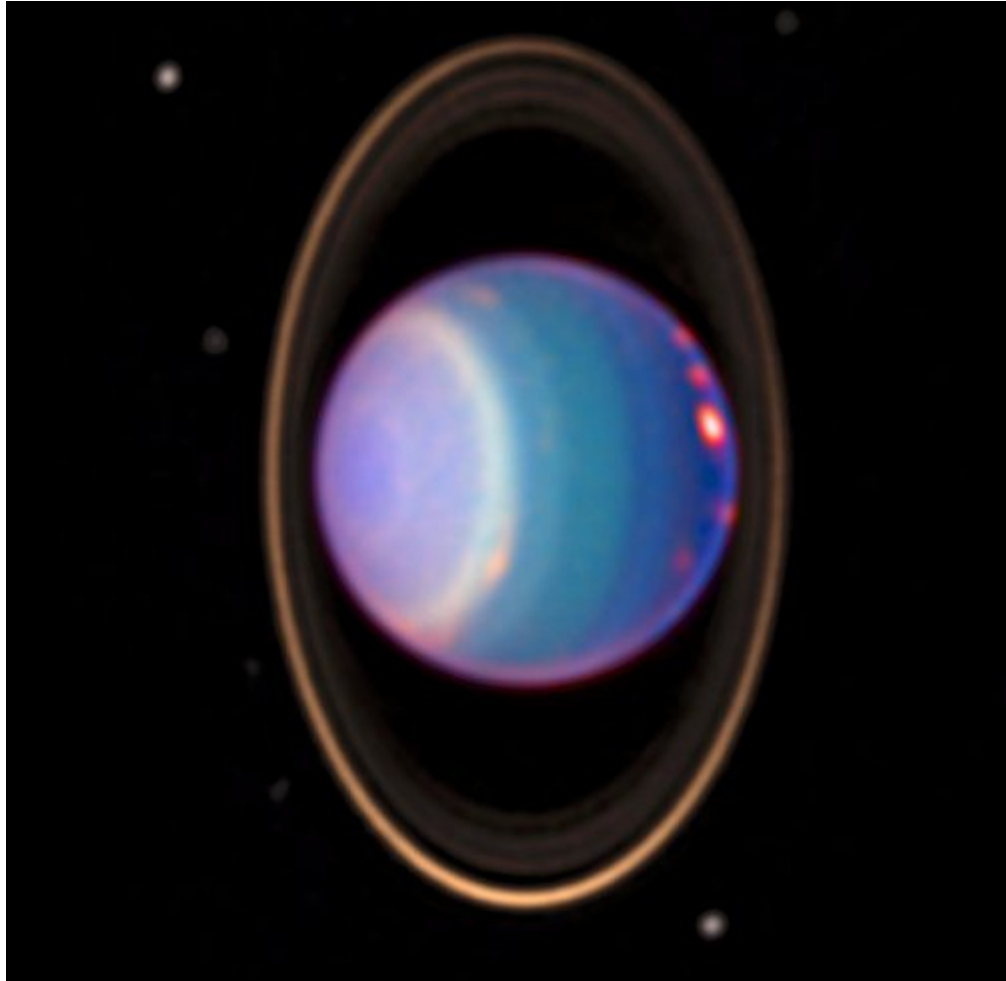
If you could find a bathtub big enough to put Saturn in, it would float.

Saturn looks like a ball that is being squished. Because Saturn spins so fast, its middle bulges while its poles flatten out. This makes Saturn look like somebody is squeezing it.

There are 47 moons orbiting Saturn. One of these bodies looks like the "Death Star" spaceship from *Star Wars*: Mimas has a large crater that covers one-third of the small moon.

Saturn was the Roman god of the harvest and the father of Jupiter. He is identified as the Greek god Cronus.

Uranus



NASA Marshall Space Flight Center

Size: About 4 Earths would fit side by side across the face of Uranus. Its diameter is 31,800 miles (51,100 kilometers), making it the third-largest planet in the solar system.

Distance from the Sun: The seventh planet from the Sun, Uranus orbits at a distance of about 1.8 billion miles (2.9 billion km), more than 19 times farther than Earth's orbit.

Orbit around the Sun: Uranus goes around the Sun once every 84 Earth years.

Rotation: Uranus spins on its axis one time every 17 hours.

Surface: Uranus does not have solid surface.

Atmosphere: The atmosphere of Uranus holds hydrogen (83 percent), helium (15 percent), and methane (2 percent). Methane is what gives Uranus its blue-green color.

Temperature: Uranus is very cold — its average temperature is -350°F (-210°C).

Escape velocity: To escape the gravity of Uranus, you need to travel 47,600 miles (76,600 km) per hour, compared to 25,000 miles (40,200 km) per hour necessary to escape Earth's gravity.

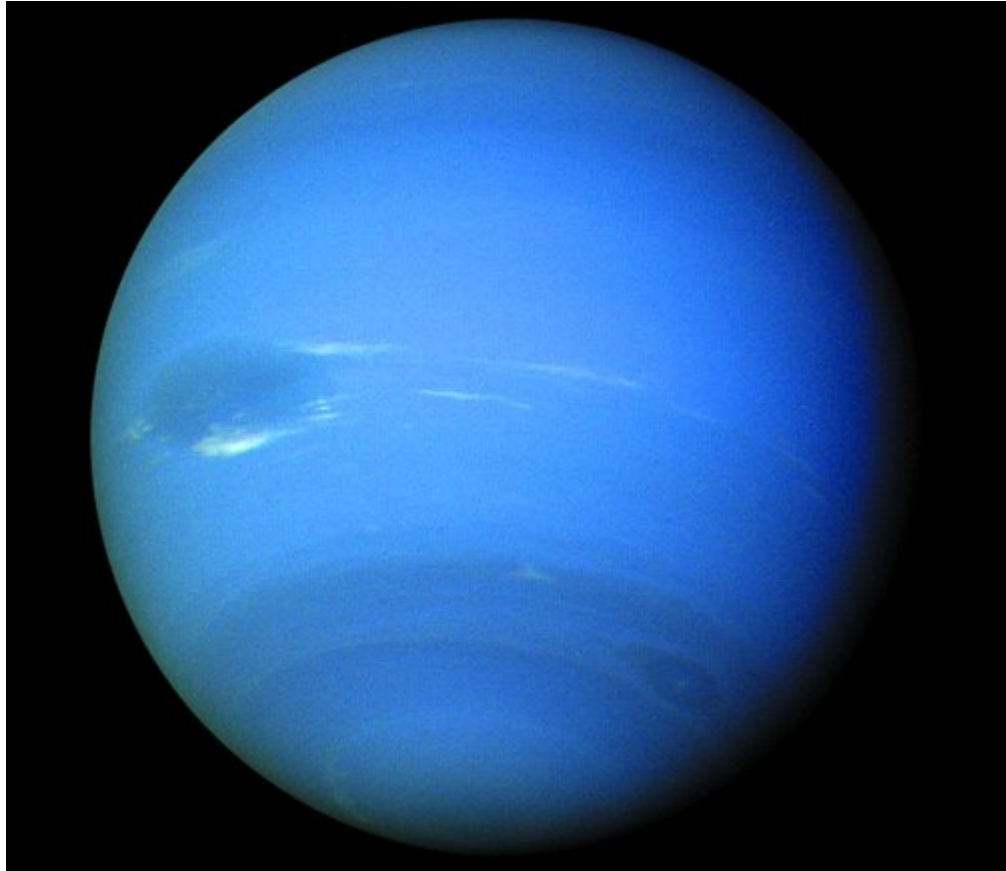
Other information: Discovered by William Herschel in 1781, Uranus is encircled by 11 narrow rings.

The planet's five largest moons are: Ariel, Umbriel, Titania, Oberon, and Miranda. There are at least 22 smaller moons.

Uranus is the planet tipped on its side. Uranus spins more like a barrel on its side than a top. This strange tilt may be the result of a collision with another body that tipped Uranus on its side.

In mythology, Uranus was the father of Saturn and grandfather of Jupiter.

Neptune



JPL / NASA

Size: Neptune is slightly smaller than Uranus and has a diameter of 31,000 miles (50,000 kilometers), so about 4 Earths would fit across its face.

Distance from the Sun: Neptune is the eighth planet from the Sun. It orbits at an average distance of 2.8 billion miles (4.5 billion km), thirty times farther than Earth.

Orbit around the Sun: It takes 165 Earth years for Neptune to go around the Sun one time.

Rotation: It takes Neptune only 16 Earth hours for it to spin on its axis once.

Surface: Like the other gas-giant planets, Neptune's "Surface" is the top of its deep atmosphere. This contains hydrogen (79 percent), helium (18 percent), and methane (3 percent), which gives the planet its blue color. Neptune's atmosphere has a striped pattern like both Jupiter's and Saturn's.

Temperature: The average temperature at Neptune is -370° F (-220° C).

Escape velocity: To escape Neptune's gravity, you need to travel 52,600 miles (84,700 km) per hour, compared to 25,000 miles (40,200 km) per hour necessary to escape Earth's gravity.

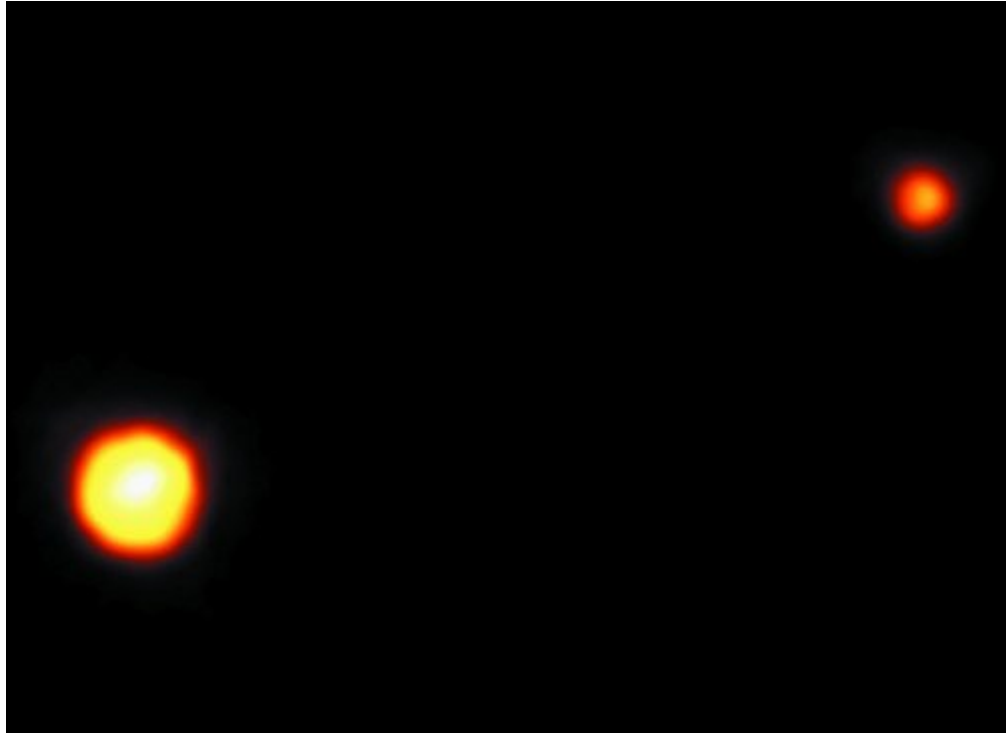
Other information: Six narrow rings encircle Neptune. Because some places have more particles than others, Neptune's rings form arcs around the planet.

Johann Galle and Heinrich D'Arrest discovered Neptune in 1846.

Neptune has 13 moons, the two largest are Triton and Nereid. Triton is made of rock and ice. Its surface is rich in water ice, dry ice, frozen carbon monoxide, methane, and nitrogen. Triton has cold geysers that spit nitrogen instead of the hot water that geysers on Earth release.

Neptune was the Roman god of the oceans.

Pluto



NASA's Hubble Space Telescope is the the clearest view to date of Pluto (left) and its moon, Charon (right). *NASA / JPL*

Size: With a diameter of only 1,485 miles (2,390 kilometers), Pluto is the smallest planet in the solar system. Because Pluto is smaller than many of the moons that orbit other planets, some scientists think Pluto should be reclassified as a minor planet.

Distance from the Sun: Pluto is the ninth planet from the Sun. It orbits our star at a distance of 3.6 billion miles (5.9 billion km), nearly forty times as far from the Sun as Earth.

Orbit around the Sun: It takes Pluto 248 Earth years to go around the Sun one time.

Rotation: Pluto spins on its axis once every 6 Earth days.

Surface: Pluto's surface has dark markings and probably is made of methane and nitrogen ice on top of a rock and water ice mixture.

Atmosphere: Pluto has a very thin atmosphere of nitrogen and methane.

Temperature: The average temperature on Pluto is -390°F (-235°C).

Escape velocity: To escape Pluto's gravity, you need to travel 2,500 miles (4,000 km) per hour, compared to 25,000 miles (40,200 km) per hour necessary to escape Earth's gravity.

Other information: Clyde Tombaugh discovered Pluto in 1930 from Arizona's Lowell Observatory.

In July 1978, James Christy discovered Pluto's moon Charon. This moon is about half as big as Pluto itself. In May 2005, astronomers used the Hubble Space Telescope to hunt for undiscovered moons around Pluto. They found two moons, provisionally known as S/2005 P1 and S/2005 P2.

Pluto was the god who ruled the dark underworld, a fitting name for the solar system's darkly lit outer world.

Comets



Gerald Rhemann and Michael Jäger

Composition: Astronomer Fred Whipple created the term "dirty snowballs" as a description of comets. These bodies are made of dust, rocks, organic compounds, and ice. Ice, in the form of dry ice, water ice, and various frozen gases, makes up most of the comet. Comets have three parts: **nucleus**, **coma**, and tail.

Size: A comet nucleus can range in size from less than a mile (1 kilometer) to 15 miles (25 km) across. The longest comet tail, which measured over 354 million miles (570 million kilometers), belonged to Comet Hyakutake in May 1996.

Location: Thought to be leftovers of the early solar system, comets originate from the Oort Cloud — an area of cometary nuclei that surrounds the Sun at a distance of thousands of astronomical units. When a nucleus gets closer to the Sun, the ice melts and a tail is created.

Orbit: Orbit lengths vary among comets. Orbital periods can last from less than a century to over

100,000 years.

Number: Astronomers believe there could be as many as one trillion comets in the Oort Cloud.

Other information: Throughout history, comets were seen as good or bad omens. In 1066, Queen Matilda, wife of William the Conqueror, commissioned the famous Bayeux Tapestry after Comet Halley appeared in the sky for months before the Battle of Hastings.

The European Space Agency's Rosetta spacecraft will be the first to undertake the long-term exploration of a comet at close quarters. Currently on its way to Comet 67P/Churyumov-Gerasimenko, Rosetta will eventually reach its target in May 2014.

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