

# ASTEROIDS



"ANCIENT SPACE RUBBLE"



Asteroids are rocky fragments left over from the formation of the solar system about 4.6 billion years ago. Most of these chunks of ancient space rubble, sometimes referred to by scientists as minor planets, can be found orbiting the Sun in a belt between the orbits of Mars and Jupiter. This region is called the Asteroid Belt or Main Belt and probably contains millions of asteroids.

In February 2001, the Shoemaker-NEAR spacecraft touched down on asteroid Eros after transmitting 69 closeup images of the surface during its descent.



While observing asteroid Ida in 1993, the Galileo spacecraft discovered a tiny moon. Scientists named the little satellite "Dactyl."

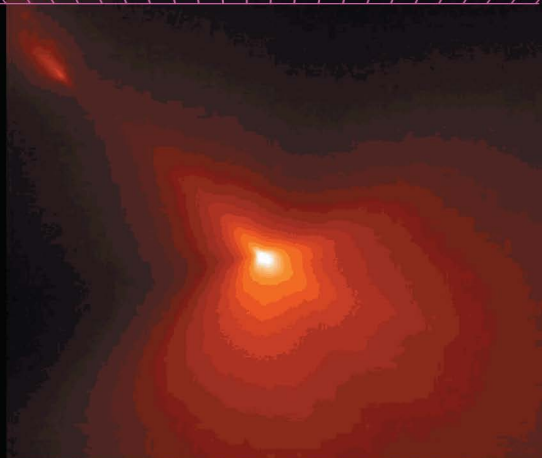


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# COMETS



"ICY TRAVELERS"



Comets are nomadic bodies of ice, rock and other material left over from the formation of our solar system about 4.6 billion years ago. Their orbits sometimes take them from the outermost reaches of the solar system to close passes by the Sun.

In 1992, comet Shoemaker-Levy 9 broke apart and two years later slammed into the planet Jupiter. It was the first time such an event had been witnessed by humans.



This composite image of comet Wild 2 was taken by the Stardust spacecraft during its close approach phase on Jan 2, 2004. The nucleus is about 5 kilometers (3.1 miles) in diameter.



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# EARTH

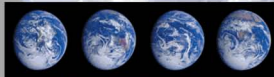


"OUR HOME PLANET"



Earth, our home planet, is the third planet from the Sun. It is the fifth largest planet in our solar system. It is the only planet we know of where life exists. Earth has hundreds of names in many languages. It has one moon.

In some ways, Earth is similar to Mercury, Venus and Mars. They are all hard, rocky planets. All four have meteor impact craters, mountains and valleys. But Earth is different in very important ways. Most of our planet is covered with water. The air is made of nitrogen, oxygen and a little carbon dioxide—just right for us to breathe. Earth is home to people, plants and animals because it has both water and the right kind of atmosphere.



Four views of Earth, taken by the Galileo spacecraft.



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# JUPITER



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"KING OF THE PLANETS"



The fifth planet from the Sun, Jupiter is the most massive planet in our solar system, and in composition it resembles a small star. In fact, if Jupiter had been between fifty and one hundred times more massive, it would have become a star rather than a planet. One of the most prominent visible features of Jupiter is the Great Red Spot, a massive storm that has raged for more than 300 years and is nearly the size of three Earths.



The Great Red Spot



Europa

To date, scientists have discovered more than 60 moons orbiting Jupiter. Ganymede is the largest planetary moon and has its own magnetic field. Liquid oceans may lie beneath the crusts of Europa and Callisto. Io has hundreds of active volcanoes.



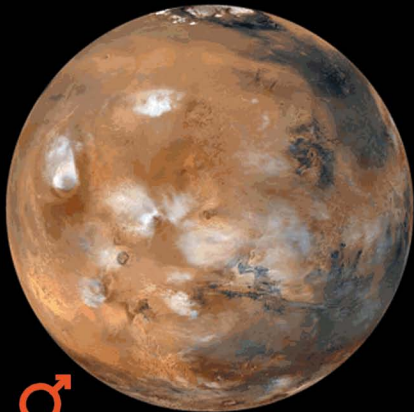
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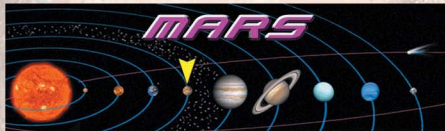
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# MARS



"THE RED PLANET"



The red planet has long inspired wild flights of imagination as well as intense scientific interest. Arid, rocky and cold, the fourth planet from the Sun offers little in the way of a hospitable environment. Yet Mars has been visited by more spacecraft than any planet beyond Earth.

This is the first color image of Mars taken by the Mars Exploration Rover Spirit. It is the highest-resolution image ever taken on the surface of another planet.



Olympus Mons

Mars is home to the tallest volcano in the solar system. Olympus Mons is about three times as tall as Mt. Everest and about the size of the state of New Mexico.



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# MERCURY

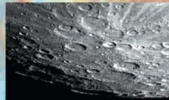


"THE SWIFTEST PLANET"



Mercury, named for the fast-footed Roman messenger of the gods, is the closest planet to the Sun. Doing justice to its name, Mercury circles the Sun in a mere 88 days, compared to 365 days for Earth, and travels through space at nearly 50 kilometers (31 miles) per second, faster than any other planet in the solar system. Mercury's surface temperatures range from a scorching 467 degrees Celsius (872 degrees Fahrenheit) to a bone-chilling -183 degrees Celsius (-300 degrees Fahrenheit).

Although Mercury has very little atmosphere, scientists have found water ice inside deep craters at the north and south poles of this hot little globe.



Mercury's South Pole

Mercury has been visited by only one spacecraft, Mariner 10, which flew by the planet three times in 1974 and 1975.



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# THE MOON



"OUR CLOSEST NEIGHBOR"



Earth's only natural satellite is smaller than four other moons in the solar system, yet it is larger than the planet Pluto. More than 70 spacecraft have been sent to the Moon and 12 astronauts have walked upon its surface. The presence of the Moon stabilizes Earth's wobble. Over billions of years, the Earth's stable spin made for a stable climate that may have influenced the development and growth of life here.

From Earth, we see the same face of the Moon all the time because the Moon rotates just once on its own axis in very nearly the same time that it travels once around Earth. This is known as "synchronous rotation."

This false-color image was taken by the Galileo spacecraft in order to help scientists interpret various lunar surface soil compositions.



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# NEPTUNE



"THE WINDIEST PLANET"



Most of the time Neptune is the eighth planet from our Sun. Sometimes Pluto's odd orbit brings it closer to the Sun and for a few years Neptune is the most distant planet. It is also most likely the windiest planet in the solar system. Winds tear through the clouds at more than 1,200 mph (2,000 kph). The winds blew Neptune's Great Dark Spot—a storm as big as Earth—across the planet at 700 mph (1,100 kph). That spot has since disappeared. A new one appeared briefly in the planet's opposite hemisphere.

Neptune has many moons and even a faint set of rings. The largest moon, Triton, is larger and colder than Pluto. Voyager 2 discovered active geysers on Triton.



Triton and Neptune



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# PLUTO



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*"THE ICE DWARF"*



Taking 248 years to orbit the Sun, Pluto is the smallest and most distant planet from the Sun. It is only about two-thirds the size of our Moon. Pluto is sometimes considered a double planet system because its moon, Charon, is about half Pluto's size, making Charon the largest satellite in the solar system in proportion to the size of its planet. Though Pluto was discovered in 1930, Charon wasn't detected until 1978. That is because Charon is so close to Pluto that they are typically blurred together when viewed through ground-based telescopes.



This is the clearest photo yet taken of Pluto and Charon, as revealed by NASA's Hubble Space Telescope.

To date, Pluto is the only planet in the solar system not yet visited by spacecraft.

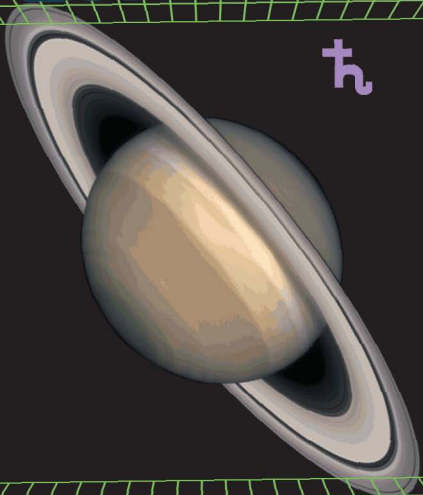


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# SATURN



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"JEWEL OF THE SOLAR SYSTEM"



Saturn, the sixth planet from the Sun, is the most distant of the five planets known to ancient stargazers. In 1611, Italian Galileo Galilei was the first astronomer to gaze at Saturn through a telescope. Like Jupiter, Uranus, and Neptune, Saturn is a gas giant. It is made mostly of helium and hydrogen. Saturn's ring system is the most extensive and complex in our solar system; including the faint E ring, it extends nearly 500,000 kilometers from the planet. In fact, Saturn and its main rings would just fit in the distance between Earth and the Moon.

In 2004 the Cassini-Huygens spacecraft arrived at Saturn and began studying the planet and its largest moon, Titan. Titan is the second-largest moon in the solar system and believed to have an atmosphere similar to Earth's long ago.

Titan's thick atmosphere



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# THE SUN



"OUR STAR"



Our Sun, the nearly 4.7-billion-year-old star that sustains life here on Earth, powers photosynthesis in green plants and is ultimately the source of all food and fossil fuel. The interaction between the Sun and Earth drives the seasons, currents in the oceans, weather and climate. With a core reaching a fiery 15.7 million kelvins (nearly 28 million degrees Fahrenheit), the Sun's surface temperature is so hot that no solid or liquid can exist there. Luckily for humans, Earth is nearly 150 million kilometers (93 million miles) away from the Sun.

As the star for nine planets, a multitude of asteroids, comets and other objects, the Sun contains more than 99 percent of the entire mass in the solar system.



The Sun in ultraviolet light.

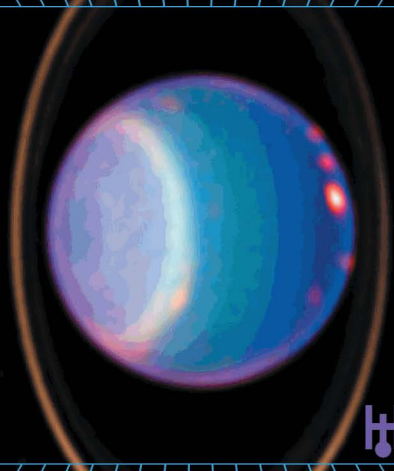


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# URANUS



*"THE TILTED PLANET"*



Uranus, the third largest planet in our solar system, may be the strangest because it spins on its side. That severe tilt to its rotational axis may result from a great collision long ago. As the seventh planet from the Sun, Uranus takes 84 years to complete an orbit. It is a "gas giant" with no solid surface. Methane gas above the cloud layers gives it a blue-green color.

The only spacecraft to visit Uranus, Voyager 2, saw few features in the planet's atmosphere when it flew by in 1986. It did discover 10 moons and two rings in addition to studying moons and rings previously seen from Earth.



Four of Uranus's moons.



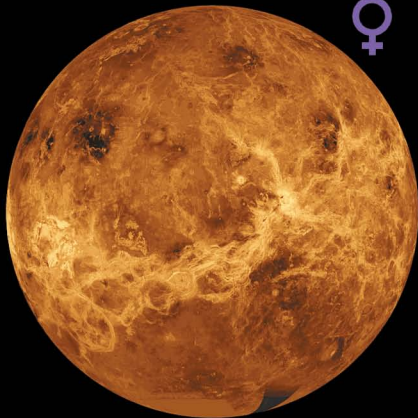
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# VENUS

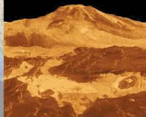


**"THE HOTTEST PLANET"**



Known for its beauty in the sky, Venus is the second planet from the Sun and similar in size to Earth. However, its immense surface heat and pressure make the planet completely uninhabitable. It has a thick, poisonous atmosphere of carbon dioxide and sulfuric acid. Thick clouds hide a surface covered with lava flows, quake faults and impact craters. In fact, one lava-filled basin is larger than the continental United States and one volcano is taller than Mt. Everest.

Computer image of the volcano Maat Mons.



In the early 1990s, NASA's Magellan spacecraft studied the rocky planet, examining the shapes of Venesian mountains, canyons and other surface features. Magellan data has been used to make maps of the surface properties and the planet's interior.



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