Exploring The Planets: Venus

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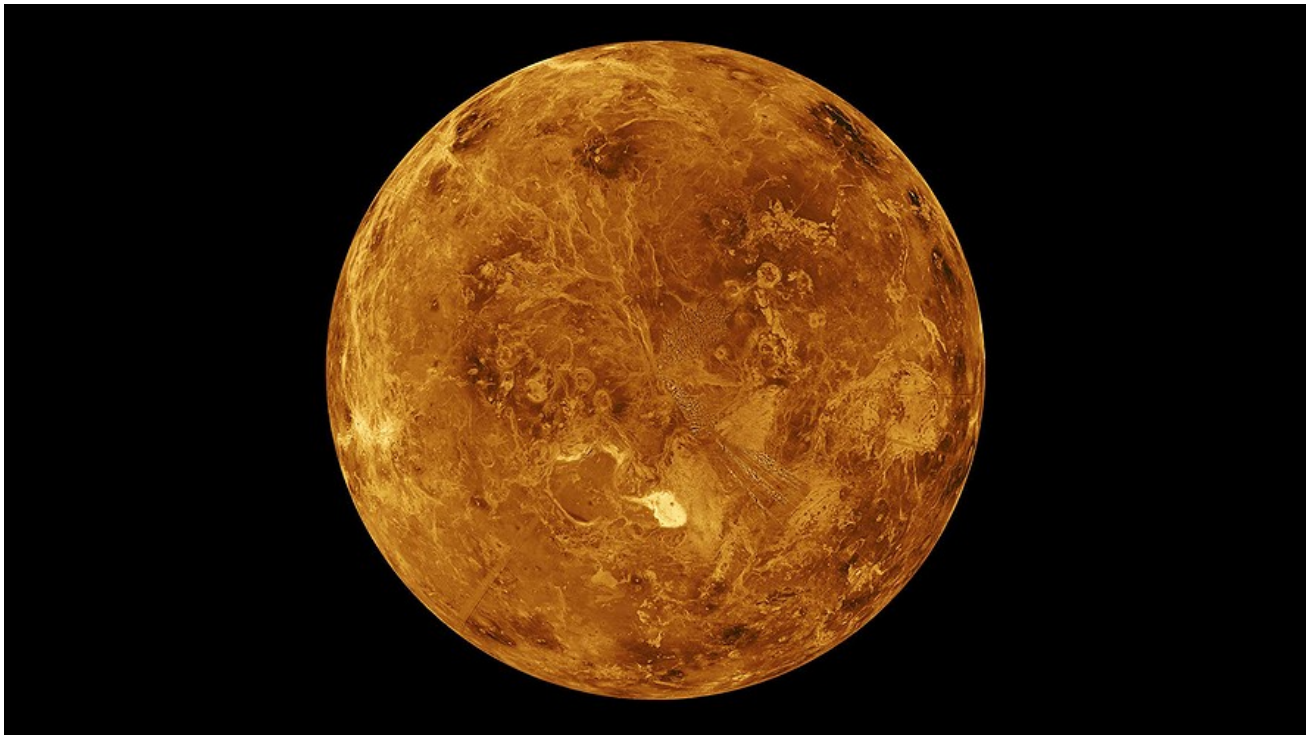


A computer simulated view of Venus, as seen by NASA Magellan spacecraft. Photo from: NASA/JPL.

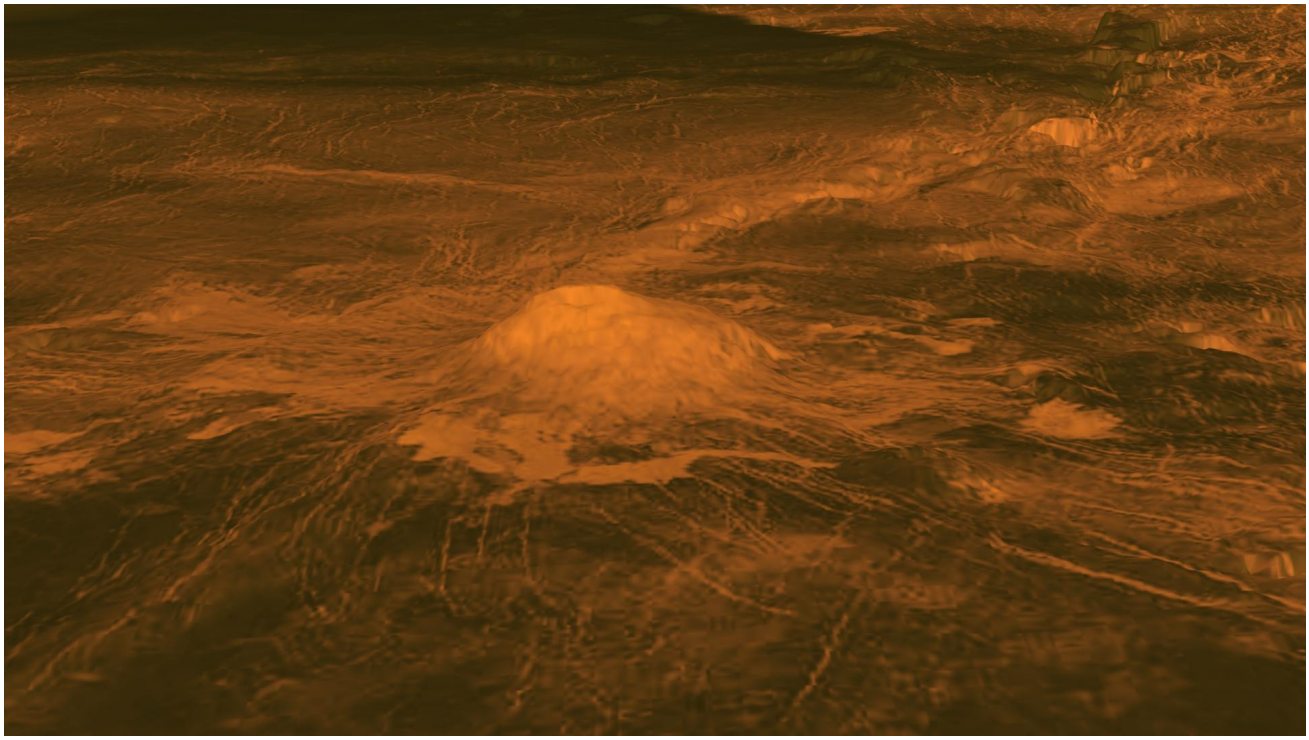
The second planet from the sun is Venus. After the moon, Venus is the most brilliant natural object in the nighttime sky. It is the closest planet to Earth, and it is also the most similar to Earth in size, mass, volume and density. These similarities suggest that the two planets may have had similar histories. Scientists are thus intrigued by the question of why Venus and Earth are now so different.

Venus was named after the ancient Roman goddess of love and beauty, but its conditions are anything but hospitable and inviting to humans. Unlike Earth, Venus is extremely hot and dry. The planet is always shrouded by a thick layer of clouds. Venus has a massive atmosphere, or surrounding layers of gases, composed mainly of carbon dioxide. This thick atmosphere traps heat, making Venus the hottest planet in the solar system.

Physical Features

Venus' orbit lies between the orbits of Mercury and Earth. These three planets plus Mars — the four innermost planets in the solar system — are known as the terrestrial, or Earth-like, planets. They are all fairly dense and rocky, with solid surfaces. Like Mercury, Venus has no known moon.

Venus is about the same size and weight as Earth. Its diameter, or distance through its center, is about 7,500 miles. Scientists believe that Venus also has layers like Earth's. These layers consist of a metal core, a thick rocky middle and a crust.



In the past, lava from erupting volcanoes shaped the surface of Venus. Most of the landscape is gently rolling plains, but Venus also has tall mountains.

The atmosphere surrounding Venus is thick and heavy, and thick clouds always cover the planet. The gases and clouds trap heat. The temperature near Venus' surface is about 867 degrees Fahrenheit, hot enough to melt lead.

Orbit And Spin

Like all planets, Venus has two types of motion: orbit and spin. The orbit is the path it takes as it travels around the sun. Venus orbits the sun in a nearly perfect circle. Venus takes 225 Earth days to complete one orbit. In other words, one year on Venus lasts 225 Earth days.

Venus also spins, or rotates about its center. A planet's orbit and spin combine in a complex way to determine the length of a day on that planet. For most planets a day is almost equal to the time it takes to complete one rotation. Venus is unusual in that the length of its day is very different than the time it takes to complete one rotation. The planet takes 243 Earth days to

complete one rotation, but a day on Venus lasts only about 117 Earth days. A day on a planet is the time it takes for the sun to appear straight overhead, to set and then to rise straight overhead again.

Observations And Exploration

People have observed Venus from Earth since ancient times, but its permanent blanket of clouds also makes it difficult to study the planet. Little was known about the surface and atmosphere until the 1960s, when astronomers made the first radar observations of Venus and unmanned spacecraft began visiting the planet.

Today, more than 20 unmanned spacecraft have visited Venus. The U.S. Mariner 2 spacecraft passed by Venus in 1962. It was the first spacecraft to fly near another planet. In 1970 the Soviet Union's Venera 7 landed on Venus. This was the first spacecraft to successfully land on another planet. In the 1990s the U.S. Magellan spacecraft mapped Venus' surface in great detail. The European Space Agency sent a craft to study Venus' atmosphere in 2005.