

VENUS

Veiled by dense cloud cover, Venus, our nearest planetary neighbor, was the first planet to be explored.

The Mariner 2 spacecraft, launched on August 27, 1962, was the first of more than a dozen successful American and Soviet missions to study the mysterious planet. As spacecraft flew by or orbited Venus, plunged into the atmosphere or gently landed on Venus' surface, romantic myths and speculations about our neighbor were laid to rest.

On December 14, 1962, Mariner 2 passed within 34,839 kilometers (21,648 miles) of Venus and became the first spacecraft to scan another planet; on-board instruments measured Venus for 42 minutes.

Mariner 5 launched in June 1967, flew much closer to the planet. Passing within 4,094 kilometers (2,544 miles) of Venus on the second American flyby, Mariner 5's instruments measured the planet's magnetic field, ionosphere, radiation belts and temperatures.

On its way to Mercury, Mariner 10 flew by Venus and transmitted ultraviolet pictures to Earth showing cloud circulation patterns in the Venusian atmosphere.

In the spring and summer of 1978, two spacecraft were launched to further unravel the mysteries of Venus. On December 4 of the same year, one of

these travelers - the Pioneer Venus Orbiter - became the first spacecraft placed in orbit around the planet.

Five days later, the five separate components making up the second spacecraft, the Pioneer Venus Multiprobe, entered the Venusian atmosphere at different locations above the planet.

The four small, independent probes and the main body radioed atmospheric data back to Earth during their descent toward the surface. Although designed to examine the atmosphere, one of the probes survived its impact with the surface and continued to transmit data for another hour.

Venus resembles Earth in size, physical composition and density more closely than any other known planet. However, spacecraft have discovered significant differences as well. For example, Venus' rotation (west to east) is retrograde (backward) compared to the east-to-west spin of Earth and most of the other planets.

Approximately 96.5 percent of Venus' atmosphere (95 times as dense as Earth's) is carbon dioxide. The principal constituent of Earth's atmosphere is nitrogen.

Venus' atmosphere acts like a greenhouse, permitting solar radiation to reach the surface but trapping the heat that would ordinarily be radiated back into space. As a result, the planet's average surface temperature is 482 degrees Celsius (900 degrees Fahrenheit), hot enough to melt lead.

A radio altimeter on the Pioneer Venus Orbiter provided the first means of seeing through the planet's dense cloud cover and determining surface fea-

tures over almost the entire planet.

NASA's Magellan spacecraft, launched on May 5, 1989, has orbited Venus since August 10, 1990. The spacecraft uses radar-mapping techniques to provide ultrahigh-resolution images of the surface.

Magellan has revealed a landscape dominated by volcanic features, faults and impact craters. Huge areas of the surface show evidence of multiple periods of lava flooding with flows lying on top of previous ones. An elevated region named Ishtar Terra is a lava-filled basin as large as the United States.

At one end of this plateau sits Maxwell Montes, a mountain the size of Mount Everest. Scarring the mountain's flank is a 100-kilometer (62-mile) wide, 2.5-kilometer (1.5-mile) deep impact crater named Cleopatra. (Almost all features on Venus are named for women; Maxwell Montes, Alpha Regio and Beta Regio are the exceptions.) Craters survive on Venus for perhaps 400 million years because there is no water and very little wind erosion.

Extensive fault-line networks cover the planet, probably the result of the same crustal flexing that produces plate tectonics on Earth.

But on Venus the surface temperature is sufficient to weaken the rock, which cracks just about everywhere, preventing the formation of major plates and large earthquake faults like the San Andreas Fault in California.

Venus' predominant weather pattern is a high-altitude, high-speed circulation of clouds that contain sulfuric acid.

* Venus is the Roman goddess of love and beauty.

- * This is the second planet from the Sun.
- * Venus is covered by clouds.
- * These clouds move three times faster than hurricane winds.
- * These clouds move east and west.
- * Venus' surface temperature is 900° F.
- * The atmospheric pressure of Venus is 97 times that of Earth.
- * Venus' upper clouds contain sulfuric acid.
- * Because Venus rotates "backward," the Sun rises in the West.
- * Venus' orbit is near circular.
- * There is evidence of two major activity volcanic areas on Venus' surface.
- * The concentration of lightning over the volcanic regions suggests frequent volcanic activity.
- * Venus has nickel-iron core.
- * No magnetic field is found on Venus.
- * Venus circles the Sun every 224.7 Earth days.
- * One Venus day would equal 243 Earth days.
- * Venus' gravity is .91 of Earth's gravity.
- * The diameter of Venus is 7,502 miles.

* Venus probably had seas at one time.

* There have been 17 space missions to Venus (12 Russian and 5 American).

Source: NASA