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# MERCURY

the 30-second astronomy

## 3-SECOND BANG

Named after the messenger of the ancient Roman gods, Mercury is a fast-moving planet of extremes—very hot by day and very cold by night.

## 3-MINUTE ORBIT

Mercury's orbit is the most elliptical of any planet, as well as the closest to the Sun, so it experiences a large variation in gravitational pull. This makes its orbit a test bed for the theory of gravity. Its orbit does not quite fit Isaac Newton's theory, but Albert Einstein's theory of gravity, known as General Relativity, solved the anomaly—and this was the first proof that General Relativity was better than Newton's theory.

Mercury is the smallest of the eight planets, with a diameter of 3,032 miles (4,879 km). The closest planet to the Sun, it is the speediest in its orbit: Mercury orbits the Sun in 88 Earth days. It rotates relative to the stars once on its axis every 59 days, turning three times on its axis for every two orbits. Because of the way that the planet rotates relative to the Sun as it orbits, its calendar is bizarre: a single day on Mercury (from sunrise to sunrise) lasts two Mercurian years or 176 Earth days. Mercury has no seasons and the largest temperature range on any planet in our Solar System—from 800°F (400°C) at noon on its equator to -300°F (-200°C) near its poles at night; the temperature is especially low in the perpetually shadowed bottoms of its polar craters, where there are accumulations of ice. Mercury has a cratered, solid surface, much like the Moon. Its atmosphere is tenuous (lacking in density) and consists of atoms trapped from the Sun or outgassed from its hot surface. Mercury's craters were formed in the same way as the craters on the Moon, through bombardment by asteroids and meteors.

## RELATED TOPICS

See also  
**THE MOON**  
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**ELLIPSES & ORBITS**  
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**GRAVITY**  
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**RELATIVITY**  
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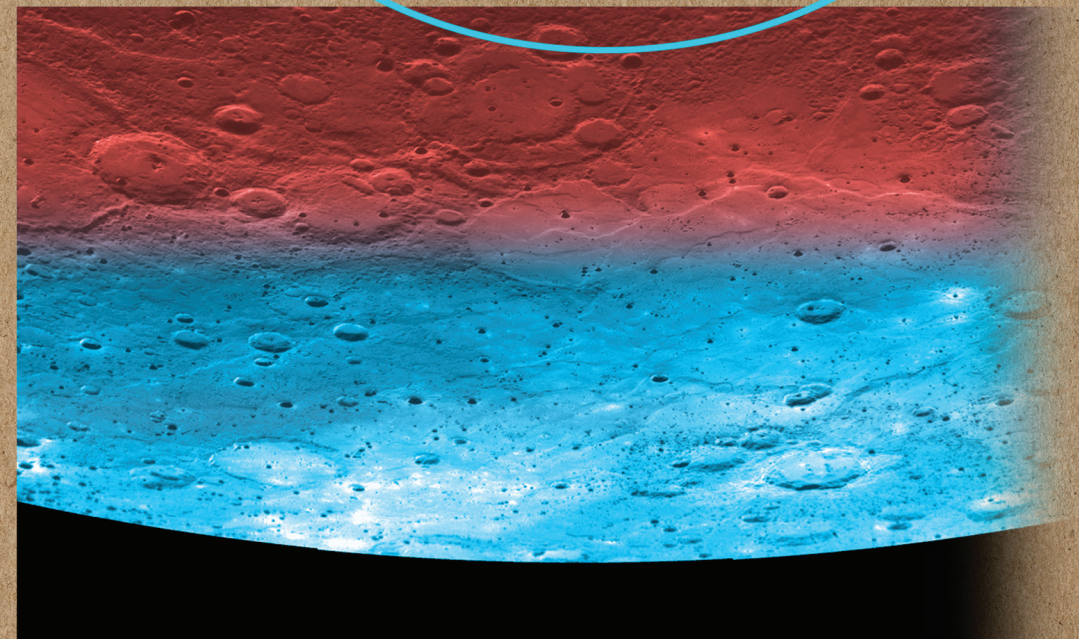
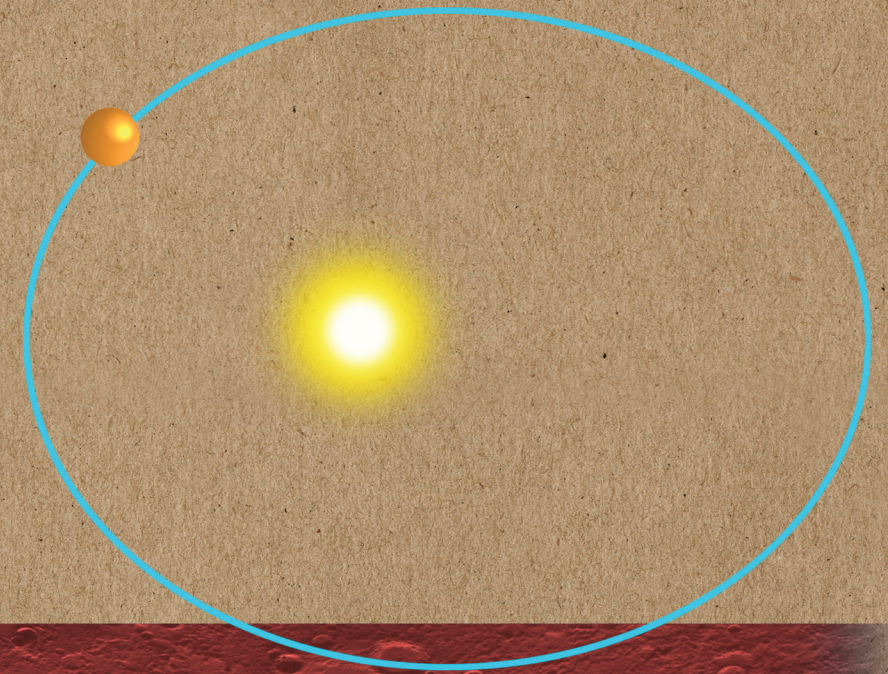
## 3-SECOND BIOGRAPHY

**ALBERT EINSTEIN**  
**1879–1955**  
German-Swiss-American  
theoretical physicist

## 30-SECOND TEXT

Paul Murdin

*With little atmosphere to act as an insulating blanket, Mercury's temperature plummets by hundreds of degrees as night falls.*



# VENUS

the 30-second astronomy

## 3-SECOND BANG

In some respects Earth's twin, the planet Venus has suffered global catastrophes that have made its surface hellish—hot, black rock beneath a sulfurous sky.

## 3-MINUTE ORBIT

Space vehicles sent to Venus must be strengthened to withstand the atmospheric pressure (about 90 times the pressure on Earth) and proofed against sulfuric acid rain falling from the clouds. They also have to withstand the searing heat. Landing craft that have survived the descent and landed on the rocks without falling over have operated only for an hour or so. The existence of Venesian extraterrestrials seems improbable.

Venus is roughly the size of the Earth, with a diameter of 7,521 miles (12,104 km). It orbits the Sun inside the Earth's orbit, once every 224 days, and rotates every 243 days—backward. Like Earth, Venus has an atmosphere, but on Venus this is hot, dense, and consists primarily of carbon dioxide, creating an intense greenhouse effect that passes on the Sun's heat to the surface and traps it below the atmosphere. As a result, the temperature on Venus averages 890°F (480°C)—hot enough to melt zinc. Seen from outside, the atmosphere supports opaque clouds that completely obscure the surface; seen from below, the sky is sulfurous yellow, as imaged by space vehicles that have landed to record the environment. Venus has been mapped by cloud-piercing radar both from Earth and from a space satellite, *Magellan* (1990–94). The surface is completely dry, and made of scaly, black, volcanic rocks. Venus has more than 100 volcanoes, with solidified rivers of lava on their sides. Most terrestrial volcanoes are due to upwelling magma penetrating the surface of a planet at the edges of colliding tectonic plates—Venus has no tectonic plates and its volcanoes are fed through weak surface spots.

## RELATED TOPICS

See also  
METEORS  
page 48

EXTRATERRESTRIALS  
page 138

## 3-SECOND BIOGRAPHY

CARL SAGAN  
1934–96  
American astronomer who identified the greenhouse effect on Venus

## 30-SECOND TEXT

Paul Murdin

*A featureless black spot when silhouetted against the Sun during a transit, Venus has been revealed by space satellites to be a volcanic wasteland.*

