

# Mercury

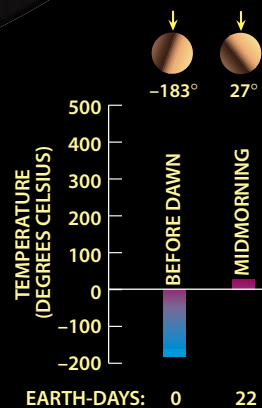
ASTROGEOLOGY TEAM, U.S. GEOLOGICAL SURVEY, FLAGSTAFF, ARIZ. (middle); NASA (bottom, left); BRYAN CHRISTIE (illustration)



## SIZE COMPARED WITH EARTH

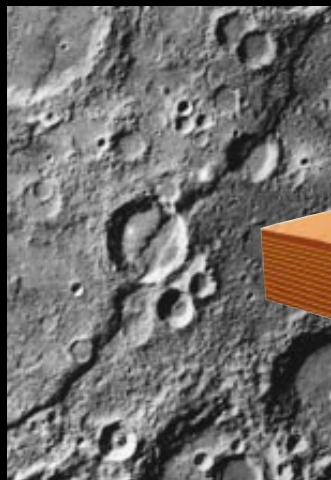
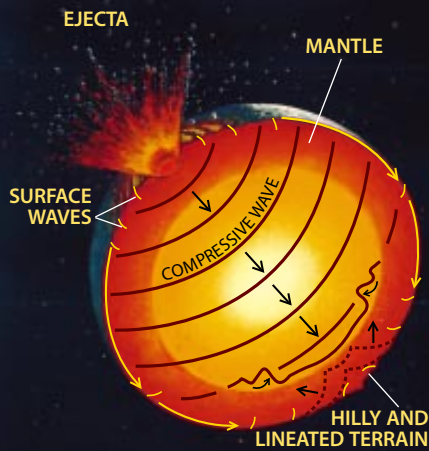


MERCURIAN DAYTIME TEMPERATURE ranges above 400 degrees Celsius (750 degrees Fahrenheit)—and, at night, plummets to almost -200 degrees C. The high temperatures preclude the existence of a significant atmosphere, because gas molecules move faster than the planet's escape velocity.



**CALORIS CRATER,** 1,300 kilometers (800 miles) across, was formed when a giant projectile hit Mercury 3.6 billion years ago (right).

Shock waves radiated through the planet, creating hilly and lineated terrain on the opposite side (below). At the center of this chaotic terrain, the Petrarck crater was created by a much more recent event, an impact violent enough to melt rock. The molten material flowed through a 100-kilometer-long channel into a neighboring crater.



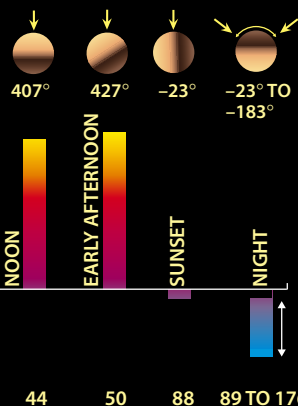
**DISCOVERY SCARP** (crack shown in images at right) is a 500-kilometer-long thrust fault probably created when parts of Mercury's core solidified and shrank. Day-break seen from inside the scarp is probably a stirring sight (below, at right).



**T**he innermost planet in the solar system, Mercury has the most extreme characteristics of the terrestrial bodies. Daytime temperatures on the planet reach 427 degrees Celsius (801 degrees Fahrenheit)—hot enough to melt zinc. At night, however, the lack of an atmosphere lets the temperature plunge to -183 degrees C, which is cold enough to freeze krypton.

Mercury is also unusually dense. To account for its density of 5.44 grams per cubic centimeter (0.20 pound per cubic inch), astronomers believe the planet must have a relatively huge core that is unusually iron-rich. The core probably takes up 42 percent of Mercury's volume; in comparison, Earth's core is only about 16 percent, and Mars's, about 9 percent.

The planet also has an intriguing relation between the amount of time it takes to rotate—59 Earth-days—and the period required for it to complete a circuit of the sun—88 Earth-days. Mercury appears locked into this 2:3 ratio of rotational to revolutionary periods by the sun's grip on the planet's gravitational bulge. This grip is strongest every 1.5 rotations of the planet.



ALFRED T. KAMAJIAN, COURTESY OF P. H. SCHULTZ AND D. E. GAULT (top); NASA (upper middle and lower middle left); NASA AND SLIM FILMS (lower middle right); SLIM FILMS (bottom left); DON DIXON (bottom right)