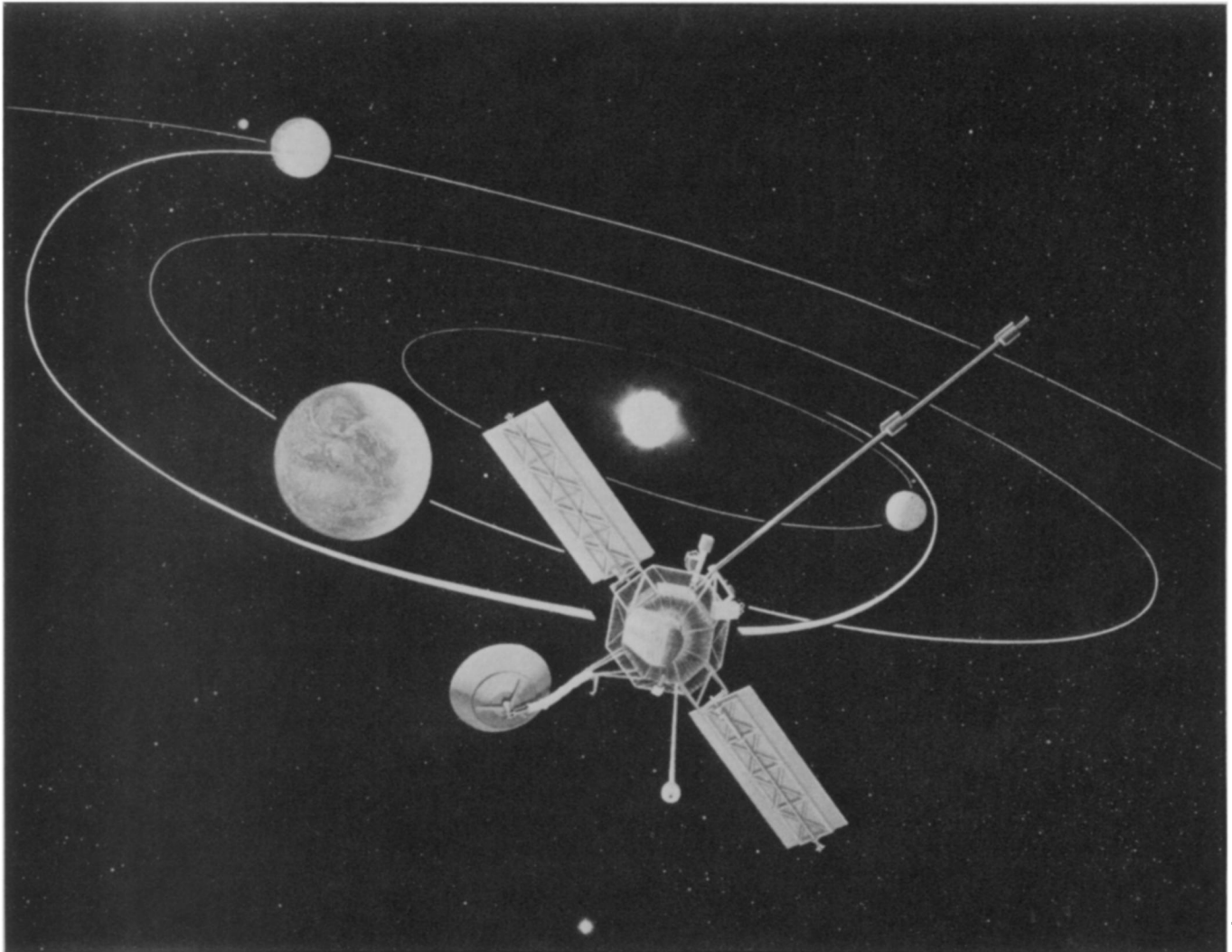


Mercury at Last

A tiny sliver on a TV screen begins the first close study of the innermost planet



NASA

In the early morning of March 23, a tiny sliver appeared on the monitor screens in the control room at the Jet Propulsion Laboratory in California. Transmitted across some 80 million miles of space by Mariner 10, the dime-sized crescent was man's first close look at the planet Mercury.

At first the image was only a glowing blur, an overexposure that was reduced in successive frames by corrections sent out from JPL. As the spacecraft moved closer to the planet, the sliver sharpened and grew, building toward March 29 when Mariner would pass less than 450 miles away, more than filling the screens with pictures of the baked world.

As early as March 24, excited scientists observed smudgy "bright spots" on the image, one of them some 300

miles across. Team leader Bruce Murray of California Institute of Technology likened the first indications to the lunar highlands, and as they grew, observers began to see the appearance of craters.

In a space-navigation first, Mariner 10 on Feb. 5 swung around Venus using the planet's gravity to point it toward Mercury. With Mercury behind it, the spacecraft will hurtle back out past Venus' orbit while Mercury goes twice around the sun ending up in just the right place to meet Mariner a second time on about Sept. 22 as the probe comes back in.

Mariner 10 has survived a multitude of ailments to reach its goal, from power problems to an overambitious gyroscope. Most serious has been the

excessive depletion of the spacecraft's attitude control gas, which must be available to keep the probe pointed in the right direction to pick up solar radiation for power, aim its observing instruments and send its data back to earth.

Flight controllers hoping for a really close encounter with Mercury may in fact have gotten a little too close. The March 29 flyby is predicted to be about 100 miles inside the "free-return zone" which would bring spacecraft and planet together a second time with a minimum of wasted gas. As a result, it may require a speed change of as much as 297 feet per second for a close second pass, which, according to a JPL official, will sharply reduce the chances of a hoped-for third encounter. □