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HERMES GLOBAL ORBITER: Mission to Mercury

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The planet Mercury, at the innermost limit of our Sun's planetary system, provides a technically challenging target for spacecraft exploration. Mariner 10, the only spacecraft to fly by Mercury, mapped about 40% of the planet's surface two decades ago. Over half of Mercury remains to be explored. Today, NASA is funding a study called the Hermes Global Orbiter (HGO) to place a spacecraft in polar orbit around Mercury.

The Hermes Global Orbiter is a proposed Discovery-class mission. Hermes will be launched aboard a Delta II rocket in 1999 and will be placed in an elliptical polar orbit about Mercury. The spacecraft is a TRW Eagle Class C Lightsat which will be modified for Mercury's environment. Remote sensing measurements of the planet's surface, atmosphere, and magnetosphere will be performed. The preliminary Hermes payload consists of an imaging system, a laser altimeter/photopolarimeter system, an ultraviolet spectrometer and a magnetometer. Key mission goals include mapping the entire surface at 1 km resolution, characterizing the surface composition, texture and topography, searching for water ice at the poles, characterizing the atmosphere, and constraining the interior structure.

The Hermes mission will address important scientific questions regarding Mercury. These problems include possible volcanic origin for smooth plains, search for iron in the crust, identification and mapping of hypothesized icy polar caps, role of impact cratering in surface evolution, distribution of atmospheric constituents and their production and loss rates, nature of magnetic and gravitational fields, and their relation to the interior.

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