

MESSENGER's First Mercury Flyby: An Overview of Observations

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The MErcury Surface, Space ENvironment, GEochemistry, and Ranging (MESSENGER) spacecraft, developed under NASA's Discovery Program, will be the first probe to orbit the planet Mercury in March 2011. Launched in August 2004, MESSENGER successfully completed the first of three flybys of Mercury in January 2008. The Mercury Dual Imaging System acquired an 11-color mosaic of part of the hemisphere not seen by Mariner 10, including the entire Caloris basin; several large monochrome mosaics at a range of resolutions; a series of color frames designed for photometric analysis; and inbound and outbound movies. The Mercury Atmospheric and Surface Composition Spectrometer obtained the first high-resolution spectral reflectance measurements (at ultraviolet to near-infrared wavelengths) of surface composition, conducted limb scans of exospheric species, and mapped the composition and structure of the tail region. The Magnetometer measured Mercury's internal field at low latitude and documented the major plasma boundaries of Mercury's magnetosphere. The Energetic Particle and Plasma Spectrometer made the first measurements of low-energy ions in Mercury's magnetosphere. The Mercury Laser Altimeter carried out the first space altimetric profile of the planet. Other instruments in the payload provided baseline measurements that will aid in the interpretation of data from the mission orbital phase. Together, the MESSENGER flyby observations have begun to advance our understanding of the innermost planet.

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