

2001 MARS ODYSSEY MISSION

R.Stephen. Saunders, Jet Propulsion Laboratory

The Odyssey spacecraft was placed into an elliptical orbit on the evening of October 23, 2001. By mid January a near-circular 2-hour, 400 km orbit was achieved through aerobraking and propulsive maneuvers. All the science instruments were checked out and calibrated during cruise to Mars. Cruise science data were obtained by the Thermal Emission Imaging System (THEMIS) (Earth-Moon family portrait), the Gamma Ray Spectrometer Suite (Gamma-Ray Spectrometer (GRS), Neutron Spectrometer (NS), and High Energy Neutron Detector (HEND)), and the Martian Radiation Environment Experiment (MARIE). The MARIE instrument stopped responding to commands in August. Gamma ray bursts, from distant extra-galactic sources, were detected by HEND and GRS during cruise. NS was used to measure the energy spectrum of fast neutrons generated by galactic cosmic rays striking the spacecraft. GRS, HEND, and NS have also detected solar energetic particle events. In the 4-months MARIE was operating it met some but not all of the cruise science goals. Two solar particle events were observed. The radiation environment as a function of time and distance from sun was measured and shown to be in fairly good agreement with what was expected from models. The Gamma sensor was operated during cruise and returned nearly 1000 hours of data. Good spectra were obtained and they will be used to remove the spacecraft signature from the gamma spectra at Mars. The neutron spectrometer was operated during cruise and operated nominally. The High Energy Neutron Detector (HEND) and the Neutron Spectrometer (NS) were turned on after Mars Orbit Insertion (MOI). Some interesting neutron spectra were obtained over several revs before aerobraking required the instruments to be turned off. HEND was operated for one month during aerobraking and collected a large volume of data that provide a 3-D model of the neutron cloud around Mars. The THEMIS instruments were successfully tested in all modes after going into orbit and before the start of aerobraking. Early results from all the instruments in mapping orbit will be discussed.