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SCIENTIFIC OBJECTIVES OF THE MMX ROVER MISSION TO PHOBOS

Abstract

The Martan Moons eXploration (MMX) mission by the Japan Aerospace Exploration Agency, JAXA, aims for the Martian Moons Phobos and Deimos. It will return samples from Phobos back to Earth and deliver a small (about 25 kg) Rover to the surface.

The Rover accommodates a payload of four scientific instruments: a Raman spectrometer (RAX) to measure the mineralogical composition of the surface material, a stereo pair of cameras looking affront also used for navigation (NavCams), a radiometer (miniRAD) to measure the surface brightness temperature and determine thermal properties of both regolith and rocks (if in the field of view), and two cameras looking at the wheel-surface interface (WheelCams). The two sets of cameras will serve for both, technological and scientific needs.

After delivery from the main spacecraft, the Rover shall be able to operate for about 100 days and investigate the terrain along its path of several tens of meters. This will allow putting the returned samples into context, studying the surface heterogeneity and obtaining information on the physical and dynamical properties of undisturbed surface material.

MMX will be launched in September 2024, the Rover delivery is currently planned for 2026 - 2027. The Rover is a contribution by the Centre National d'Etudes Spatiales (CNES) and the German Aerospace Center (DLR) with additional contributions from INTA (Spain) and JAXA.