

IAF SPACE EXPLORATION SYMPOSIUM (A3)  
Small Bodies Missions and Technologies (Part 1) (4A)

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SCIENCE OBJECTIVES OF THE MMX PHOBOS ROVER

**Abstract**

The Mars Moon eXploration (MMX) mission by the Japan Aerospace Exploration Agency, JAXA, is going to explore the Martian Moons Phobos and Deimos. In addition to investigating the moons remotely and returning samples from Phobos, MMX will also deliver a small (about 25 kg) Rover to the surface.

The payload of the Rover consists of four scientific instruments: RAX, a Raman spectrometer to measure the mineralogical composition of the surface material, NavCam, a stereo pair of cameras looking ahead to investigate the terrain and also serve for navigation, miniRAD a radiometer measuring the surface brightness temperature of both regolith and rocks, and two WheelCams looking at the wheel-surface interface, and thus investigating the properties and dynamics of the regolith. The cameras, will serve for both, technological and scientific needs.

Rover delivery is foreseen during the rehearsal of the landing operations of the main spacecraft and will thus be close to the first sampling area. During its operational lifetime on the surface of Phobos (about 100 days), the in-situ measurements performed with the rover payload will allow putting into context the returned samples, providing ground truth, studying the surface heterogeneity and obtaining information

on the physical properties of undisturbed surface material. MMX is planned to be launched in September 2024, the Rover delivery is scheduled for 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.