Mercury Surface in the Planetary Emissivity Laboratory (PEL): Preparing for MERTIS on BepiColombo

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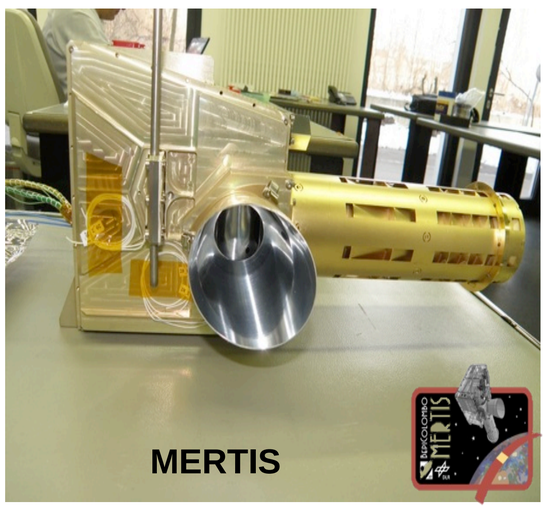
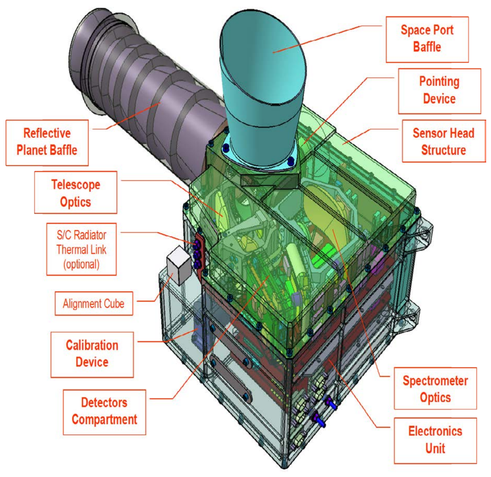
MERTIS (MErcury Radiometer and Thermal Infrared Spectrometer) is one of the scientific payloads of the ESA deep space mission BepiColombo. MERTIS is an imaging spectrometer obtaining hyper-spectral data in the thermal IR (TIR) wavelength range (7-14 µm) with a medium spatial resolution to determine the mineralogical composition of the Mercury's surface. Sharing the same optical path a pushbroom micro-radiometer is integrated allowing measurements of the Mercury surface temperature and obtaining the thermal inertia of the regolith.

Principle Investigators: Dr. J. Helbert DLR – Prof. H. Hiesinger University of Münster

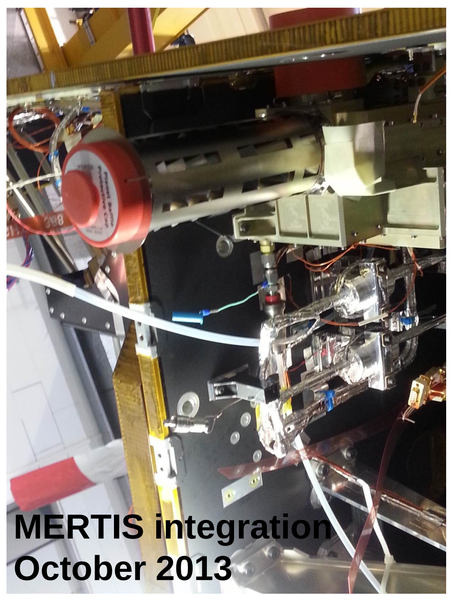


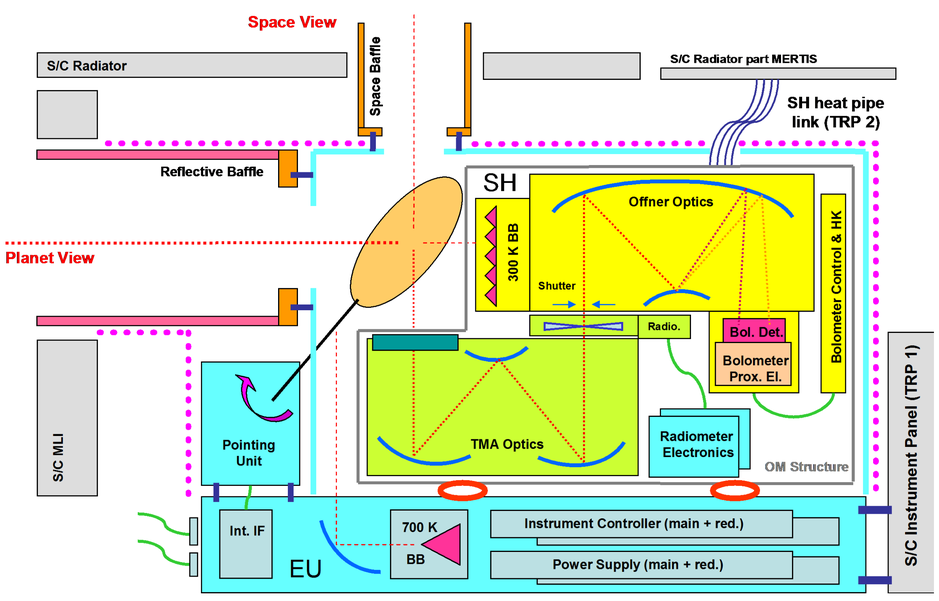


- **Monoblock**
- **3.1 kg - 10W**
- **Uncooled microbolometer**
- **7-14µm @ 200nm**
- **Global coverage @ up to 280m**
- **Integrated µ-radiometer 7-40 µm**

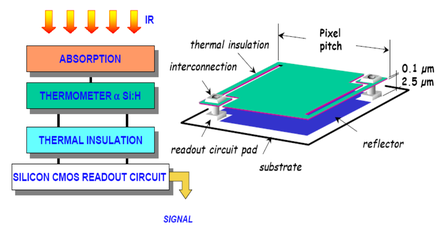
Scientific Objectives of MERTIS:

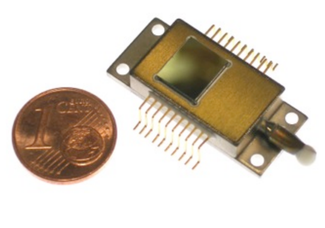
1. **Study of Mercury's surface composition in the TIR**
2. **Identification of rock-forming minerals**
3. **Global mapping of the surface mineralogy**
4. **Study of surface temperature and thermal inertia**



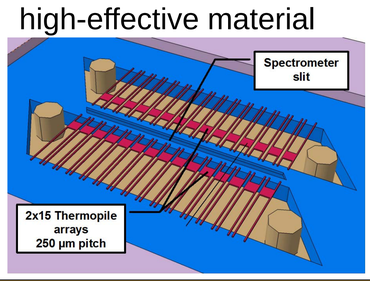


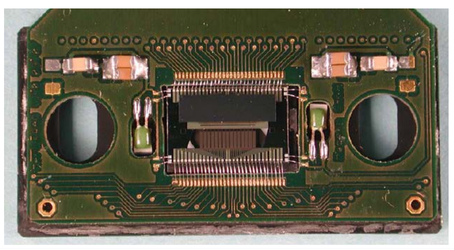
Detector : Resistive semi-conductor micro-bolometer





Radiometer : Thin film IR thermopile with thermoelectric high-effective material





MERTIS measure the thermal radiation emitted from the hot Mercury surface, that by means of internal calibration target measurements are calibrated to surface emissivity spectra. The interpretation of surface emissivity spectra can be successfully carried out only with the support of a wide database of emissivity measurements on analogue materials. At the Planetary Emission Laboratory (PEL) of DLR we measure emissivity of powdered or bulk materials in vacuum, at typical Mercury diurnal temperature