

Space Studies of the Earth-Moon System, Planets, and Small Bodies of the Solar System (B)  
Mercury: Visiting an Elusive Planet (B07)

## **BRIDGING THE GAP – FROM MASCS ON MESSENGER TO MERTIS ON BEPICOLOMBO**

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On 14 January 2008 the NASA MESSENGER probe became the first spacecraft to fly by Mercury since Mariner 10 in 1975. This flyby will be followed by two more before MESSENGER enters orbit around Mercury in 2011. In 2013 the ESA BepiColombo mission will be launched towards Mercury and enter orbit in 2019. The MESSENGER and BepiColombo missions both carry comprehensive suites of instruments aimed at understanding the surface composition of Mercury. The data interpretation and the planning of observations will pose a number of challenges. Not only is our knowledge about Mercury's surface composition very limited, but we also know little about the texture and physical properties of the regolith.

We will report on our efforts to bridge the gap between these missions, especially between two highly complementary instruments – the Mercury Atmospheric and Surface Composition Spectrometer (MASCS) on MESSENGER and the Mercury Radiometer and Thermal Infrared Spectrometer (MERTIS) on BepiColombo. The Visible and Infrared Spectrograph (VIRS) channel on MASCS covers the spectral range from 400 to 1250 nm and focuses on measuring the reflected sunlight from the surface. Its long-wavelength cut-off was specifically chosen to avoid the spectral range where thermal emission from Mercury's hot surface becomes significant. The spectral channel of MERTIS covers the spectral range 7-14  $\mu\text{m}$  where the spectrum is dominated by thermal emission.

In order to link these two spectral ranges and fully explore their synergy we use the Planetary Emissivity Laboratory (PEL) at the Institute for Planetary Research, DLR. With its currently ongoing upgrade the PEL has the unique capability to measure the emissivity of fine-grained ( $>25 \mu\text{m}$ ) planetary-analog materials at temperatures up to 500°C in the wavelength range 1-50

$\mu\text{m}$ . This spectral coverage means that in the same measurements we may obtain data relevant for the infrared channel of MASCS and for the MERTIS instrument.

We will present spectral measurements on a set of Mercury-analog materials defined as standard for the development, testing, and calibration of MERTIS. We will focus on the application of this small set of analog materials to the analysis of MESSENGER data and the potential need for amendments to the list as well as a discussion of implications for the scientific return from MERTIS.