**Deutsches Zentrum
für Luft- und Raumfahrt**
German Aerospace Center

DAAD
Deutscher Akademischer Austauschdienst
German Academic Exchange Service

Linder Höhe
D-51147 Köln
Telephone: +49 (0)2203 601-0
Internet: https://www.dlr.de

Kennedyallee 50
D-53175 Bonn
Telephone: +49 (0)228 882-0
E-mail: dlr-daad-program@daad.de
Internet: https://www.daad.de/dlr

DLR – DAAD Fellowships

Fellowship No. 389

Research Area :	Space
Research Topic:	**Improved predictions on the capability of MERTIS on BepiColombo to identify rock-forming minerals on Mercury**
DLR Institute:	Institute for Planetary Research, DLR Berlin
Position:	Postdoctoral Fellow
Openings:	1
Job Specification:	The planet Mercury is the innermost of the terrestrial planets and understanding its formation and evolution are important to understand the formation of the solar system. The surface composition of Mercury is still largely unknown. The NASA MESSENGER mission provided new insights into the geochemistry of Mercury, but its limited spectral coverage did not allow identification of minerals or rock types on the surface. The MErcury Radiometer and Thermal infrared Imaging Spectrometer (MERTIS) is part of the payload of the Mercury Planetary Orbiter spacecraft of the ESA-JAXA BepiColombo mission. MERTIS's scientific goals are to infer rock-forming minerals, to map surface composition, and to study surface temperature variations on Mercury. To achieve these science goals MERTIS combines a imaging spectrometer covering the wavelength range from 7-14 microns with a radiometer covering the wavelength range from 7-40 microns. MERTIS will map the whole surface of Mercury with a spatial resolution of 500m for the spectrometer channel and 2km for the radiometer channel. MERTIS has been successfully commissioned in orbit in November 2018. From this commissioning it is now possible to derive updated numbers on the performance of both MERTIS channels. In addition in the last years the Planetary Spectroscopy Laboratory (PSL) has been significantly extended, including the recent addition of a Hyperion IR Microscope. PSL is optimized to perform measurements on Mercury analog samples at temperatures up to 480°C – typical for the dayside of Mercury. The correct and efficient interpretation of the spectral data returned by the MERTIS instrument will be a challenging task. Not only will MERTIS return

a large dataset, the spectral data will also be affected by shifts of the characteristic feature due to varying surface temperatures.

Given the new performance numbers and the newly available PSL capabilities it is now the time to re-evaluate the base set of MERTIS analog materials and include new samples, including meteorites, synthetic samples. This will allow to provide an improved prediction on the MERTIS capability to identify rock-forming minerals on the surface of Mercury.

Required Qualification: Experience in high temperature laboratory spectroscopy

Advantageous Skills: Spectral analysis of remote sensing emissivity measurements

English competence: See requirements on www.daad.de/dlr

Earliest Start Date: 1.7.2019

Application Deadline: 15.5.2019

Further Information: http://www.dlr.de
http://www.daad.de/dlr