Research Area: Space

Research Topic: Evolution and present-day state of Mars' subsurface environment

DLR Institute: Institute of Planetary Research, Department of Planetary Physics, DLR Berlin-Adlershof, Germany

Position: Postdoctoral Fellow

Openings: 1

Job Specification: The Institute of Planetary Research carries out and supports research programs on the internal structure, formation and evolution of the planets, their moons, and asteroids and comets of our Solar System and other planetary systems. One of the most interesting targets in view of planetary habitability is the planet Mars. On Mars, a number of orbiter and landed missions (e.g., Mars Express, MER, Curiosity, Mars Reconnaissance Orbiter) have revealed some of the most spectacular surface geological features in the Solar System. The presence of surface liquid water during the planet’s early history has been identified through geomorphological and spectroscopical analyses of the surface. While today liquid water is not stable on the surface, liquid water may still be available in the Martian subsurface. Current and forthcoming missions will provide further valuable data to constrain the near-surface environment and subsurface composition of Mars, which are directly connected with the presence and distribution of groundwater on Mars. The junior research group “Magmatic evolution and outgassing history of Mars and Venus predicted from coupled geodynamical-petrological modeling” within the Department of Planetary Physics at the DLR Institute of Planetary Research employs an interdisciplinary approach that combines large-scale geodynamical models of thermal evolution with petrological and geological datasets to investigate the thermal state and evolution of the Martian subsurface.

For our group, we are looking for a highly motivated postdoctoral researcher to support our research that combines geomorphological
analysis of the Martian surface with modeling of the subsurface thermal environment of Mars. The goal of this project is to collect a large and diverse dataset about the geomorphology, spectroscopy and mineralogy of the Martian surface. These data, combined with results from large-scale geodynamical models of the Martian interior, will be applied to interpret the evolution and present-day state of the subsurface environment of Mars. In particular, this work will be used to provide constraints on the past and present-day distribution of potential subsurface water on Mars and to identify possible habitable regions in the Martian subsurface.

**Required Qualification:**
- PhD degree in physics, geology, geosciences, or similar disciplines
- Strong interest in planetary science
- Excellent analytical skills
- Programming experience in high-level languages (Python, Matlab or similar)
- Good knowledge of quantitative geomorphology and planetary surface processes
- Experience with remote sensing and spectroscopical analysis
- Ability to work in a structured way both, independently and as part of a team

**Advantageous Skills:**
- Track record of scientific publications in planetary science
- Knowledge of numerical methods for solving partial differential equations such as heat diffusion equation
- Experience with hydrological modeling

**English competence:**

**Very good communication skills in English:** See requirements on [www.daad.de/dlr](http://www.daad.de/dlr)

**Earliest Start Date:** February 1st, 2020

**Application Deadline:** Until position filled

**Further Information:** [http://www.dlr.de](http://www.dlr.de)  
[https://www.dlr.de/pf/en/](https://www.dlr.de/pf/en/)  
[http://www.daad.de/dlr](http://www.daad.de/dlr)

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