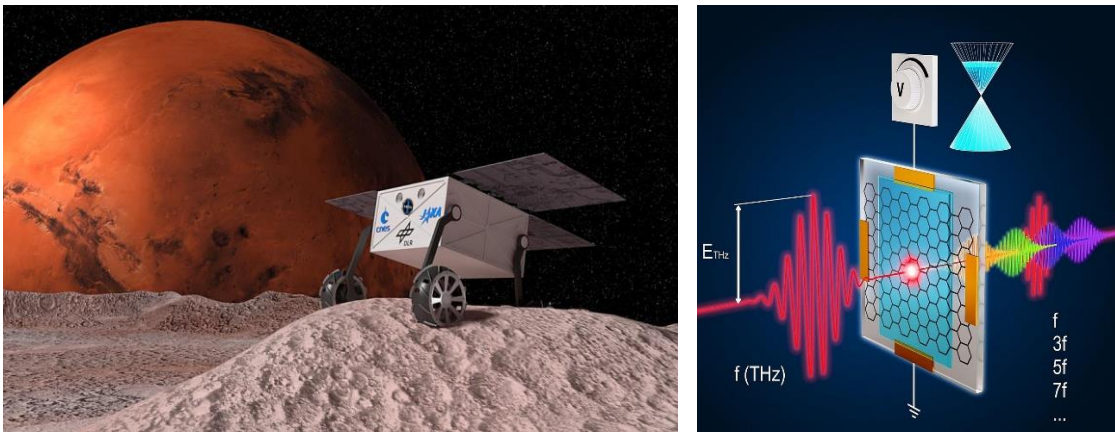


## Open PhD position for the development of quantum technology-based in-situ spectroscopy on Mars



We are looking for a highly motivated, enthusiastic, and team-oriented PhD student with a background in physics/spectroscopy/quantum sensing. The goal is to develop instrumentation for quantum technology-based in-situ spectroscopy on Mars. The collaborating department of [Terahertz and Laser Spectroscopy](#) at the DLR has recently contributed to the development of a modestly compact, still conventional Raman spectrometer for the upcoming moons exploration mission (MMX). This instrument is giving access to the characteristic vibrational fingerprint of planetary materials operated on board of a very compact Rover on the Mars moon Phobos. In the PhD project, recent advances in quantum technology shall be utilized to verify if time-domain based concepts can achieve a similar or larger information depth with a significantly more compact, in the best case, chip-integrated architecture.



(left) Artist view of the MMX rover on Phobos and (right) cartoon of the [recently discovered](#) extremely efficient frequency multiplication in the Dirac material graphene.

### Job description

- Compact, chip-integrable, spectroscopy concepts based on novel quantum technology and nonlinear optics shall be developed
- THz source concepts based on novel Dirac materials and novel spintronic emitters shall be qualified
- Feasibility of detecting the terahertz energy fingerprint of planetary materials by emission from strongly driven quasi-particles shall be investigated
- The applicability of the developed concepts on Mars shall be verified in the research laboratories at the DLR Institute of Optical Sensor Systems

### Your profile

- Master degree in physics
- Experience in spectroscopy and/or quantum sensing
- The ability to work in a structured and independent manner
- Excellent problem-solving skills
- Excellent team and communication skills
- Previous experience in quantum technology, applied optics, femtosecond lasers or nonlinear optics is of advantage
- Good English skills required; willingness to acquire the missing language skills

### **We offer**

- Exciting work environment on an attractive research campus in Berlin
- Stimulating exchange within the BOS.QT research school
- Close cooperation with the Institute of Optical Sensor Systems at the German Aerospace Center (DLR) in Berlin and with AG Terahertz Physics at the FU Berlin
- Participation in conferences and an international measurement campaign
- Three years contract with 75% of salary grade E 13 TV-L HU

### **Contact**

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