



# PHYSIKALISCHES KOLLOQUIUM

des Fachbereichs Physik  
der Johann Wolfgang Goethe-Universität Frankfurt

Mittwoch, den 05.07.2017, 16 Uhr c.t.  
Großer Hörsaal, Raum \_0.111,  
Max-von-Laue-Str. 1



## Prof. Dr. Heinz-Wilhelm Hübers

Deutsches Zentrum für Luft- und Raumfahrt e.V., Institute  
of Optical Sensor Systems, Berlin

and

Humboldt-Universität zu Berlin, Department of Physics

### *"High-resolution terahertz spectroscopy with the Stratospheric Observatory for Infrared Astronomy "*

Heterodyne spectroscopy is a powerful technique for high-spectral-resolution remote sensing in astronomy and atmospheric research. An emission of particular importance is the atomic oxygen (OI) fine-structure line at 4.7448 THz. This is a major cooling line of the interstellar medium and an important constituent of planetary atmospheres. The German Receiver for Astronomy at Terahertz Frequencies, on board of SOFIA, the Stratospheric Observatory for Infrared Astronomy, is the only spectrometer which can observe this line with MHz spectral resolution. The heterodyne spectrometer is based on a quantum-cascade laser as local oscillator and superconducting hot electron bolometric mixers. The design and the performance of the 4.7-THz spectrometer will be presented. In particular the QCL-based local oscillator will be discussed, because this unique laser system enables observations of the OI line for the first time. Since May 2014, the system has served on 27 successful flights leading to exciting new discoveries, for example OI in the Martian atmosphere. Some of the highlights of these observations will be presented.

Die Dozenten der Physik

local host: Apl. Prof Viktor Krozer, [krozer@physik.uni-frankfurt.de](mailto:krozer@physik.uni-frankfurt.de)