Master and Bachelor Theses in Microwave Remote Sensing

The Microwave Physics group at the Institute of Applied Physics develops sensitive millimeter wave radiometers for atmospheric remote sensing applications and uses them to study stratospheric ozone, water vapor, temperatures and winds. We are also developing the optics and blackbody calibration targets for different space missions, including the THz sounder SWI on the ESA Jupiter mission JUICE and the Arctic Weather Satellite AWS.

We currently offer Master and Bachelor projects on the following topics:

- THz calibration targets for the Jupiter mission JUICE: Experimental characterization of temperature gradients and their numerical simulation using finite element analysis software COMSOL
- Characterization of novel internal and external radiometric calibration devices for an upcoming ESA mission
- High frequency material measurements at cryogenic temperatures for an ESA project
- Remote sensing of precipitation with a micro rain radar
- Weather Research and Forecasting model (WRF): idealized case simulation of turbulence and water vapour fluctuations
- Two Msc/Bsc projects in collaboration with MeteoSwiss, Payerne: Analysis of Ozone time series and polarimetric calibration of a Raman LIDAR
- Investigation of Arctic dynamics and its relation to ozone and water vapor observed with our GROMOS-C and MIAWARA-C instruments on Svalbard
- Gravity wave analysis from tomographic 3DVAR retrievals using multi-static meteor radar networks
- Studying of Mesospheric/Stratospheric dynamics above the alpine region using the wind radiometers WIRA and WIRA-C and its impact on trace gases
- Full wave scattering modeling of meteoric plasmas and analysis of meteor radar data
- Implementation of software defined radio (SDR) receiver for passive radar observations of satellites and meteors and radio interferometry

For more information, please contact the head of the IAP Microwave Physics Division, Dr. Axel Murk.