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**UNIVERSITÄT**  
**BERN**

Institute of Applied Physics

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## 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 calibration units and optics for the THz instrument SWI on the ESA Jupiter mission JUICE and for different microwave sounders on Earth observing satellites for numerical weather prediction and climate sciences.

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

- Development of a novel polarimetric 60 GHz radiometer for the observation of stratospheric temperatures and dynamics: Tests of the digital correlation receiver
- 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 metallic coatings for satellite reflector antennas using a free space millimeter-wave resonator, and correlation of the test results with observations of our ground-based remote sensing instruments
- Investigation of different radiometric calibration methods for satellite instruments in the frame of an ESA project
- Upgrade of the Radio Telescope lab course for pulsar observations and interferometry
- Radiative transfer simulations for the Jupiter atmosphere and surface properties of its icy moons
- Investigation of Arctic Dynamics and its relation to ozone and water vapor observed with the radiometers GROMOS-C and MIAWARA-C
- Full wave scattering modelling of meteoric plasmas and analysis of meteor radar data
- Studying of Mesospheric/Stratospheric dynamics above the alpine region using the wind radiometers WIRA and WIRA-C and its impact on trace gases

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