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UNIVERSITÄT
BERN

Institute of Applied Physics

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Master and Bachelor Theses at the Institute of Applied Physics

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 correlation receiver and optical design
- 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
- High frequency material measurements of 3D printed radar absorbers and other novel composites that are used in black-body calibration targets for satellite instruments
- Development signal processing algorithms for a wind profiling radar in collaboration with Meteosuisse
- Rain rate retrievals with the tropospheric water radiometer TROWARA and comparison with a rain radar
- Radiative transfer simulations for the Jupiter atmosphere and surface properties of its icy moons
- Retrieval of atmospheric trace gas profiles and temperatures from observations with our radiometers in Bern and in the Arctic

For more information, please contact the head of the IAP Microwave Physics Division,
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