



UNIVERSITY
OF COLOGNE

Faculty of Mathematics and Natural Sciences

Postdoctoral position in microwave radiometry of clouds on the HALO research aircraft (f/m/x)

Institute of Geophysics and Meteorology (IGMK)

We are one of the largest and oldest universities in Europe and one of the most important employers in our region. Our broad range of subjects, the dynamic development of our main research areas and our central location in Cologne make us attractive for students and researchers from around the world. We offer a wide range of career opportunities in science, technology, and administration.

The project "Submillimeter radiometry: Towards a pan-Arctic ice cloud climatology (TOPAICC)" investigates Arctic ice clouds and their role in airmass transformation and the polar energy budget using novel submillimeter radiometry aboard the HALO aircraft. During two Arctic HALO campaigns, the new HAMPng-SMR instrument will operate alongside radars, lidar, and microwave radiometers to observe ice clouds and atmospheric humidity. TOPAICC will develop retrievals of ice water path and related cloud properties, evaluate their representation in the ICON model, and assess emerging satellite observations from ICI and AWS. The resulting benchmark observations will support satellite retrieval validation and the development of long-term pan-Arctic ice cloud climatologies.

YOUR TASKS

As a Postdoctoral Researcher, you will play a central role in the scientific implementation of TOPAICC. Your work will span airborne observations, radiative transfer, retrieval development, atmospheric modelling, and satellite remote sensing. In particular, you will:

- » Prepare and participate in the two Arctic airborne campaigns CONIDA-Night (winter 2028) and CONIDA-Day (summer 2029) from Kiruna, Sweden.
- » Participate in the HALO research flights, including scientific flight planning, instrument calibration and operation, and data preparation.
- » Develop realistic training datasets using PAMTRA radiative transfer forward and ICON simulations.
- » Develop and evaluate retrieval methods for ice cloud properties and water vapour based on statistical and machine-learning approaches.
- » Exploit synergies between submillimeter and millimeter radiometry, cloud radars, and lidar to characterize retrieval uncertainties and establish benchmark datasets.
- » Investigate cloud-phase transitions during Arctic airmass transformation and evaluate their representation in ICON.
- » Compare airborne with current satellite observations, particularly from ICI, AWS, PoSIR, and EarthCARE.
- » Investigate spatial-resolution and satellite-footprint effects and their implications for satellite IWP retrievals and Arctic ice-cloud climatologies.
- » Publish high-quality datasets according to FAIR principles and disseminate results through peer-reviewed publications and presentations at international conferences.
- » Collaborate closely with scientists within the CONIDA consortium and with national and international partners in atmospheric remote sensing and modelling.

YOUR PROFILE

We are looking for a motivated researcher with a strong interest in atmospheric observations, remote sensing, and cloud processes. Ideally, you have:

- » A PhD in atmospheric science, meteorology, physics, geophysics, remote sensing, or a closely related field.
- » Experience with microwave/submillimeter remote sensing, cloud observations, radiative transfer, or atmospheric modelling.
- » Experience in atmospheric field campaigns, including instrument operation, campaign preparation, data acquisition,

and/or quality control; experience with airborne research campaigns is particularly advantageous.

- » Strong programming and scientific data-analysis skills, preferably in Python.
- » Experience with radiative-transfer models, numerical weather or climate models, or satellite data is advantageous.
- » An interest in developing and applying retrieval and machine-learning methods to atmospheric observations.
- » Willingness to participate actively in airborne field campaigns, including campaign preparation, participation in research flights, instrument operation, flight planning, and subsequent data analysis is mandatory.
- » The ability to work both independently and collaboratively within a large international research team.
- » Good scientific communication skills and English language proficiency.

WE OFFER

- » A position in an internationally well-established working group with state-of-the-art research facilities
- » A diverse working environment with equal opportunities
- » Support in balancing work and family life
- » Extensive advanced training opportunities
- » Occupational health management offers
- » Flexible working time models
- » Opportunity to work remotely

The University of Cologne promotes equal opportunities and diversity. Women will be considered preferentially in accordance with the Equal Opportunities Act of North Rhine-Westphalia (Landesgleichstellungsgesetz – LGG NRW). We also expressly welcome applications from all suitable candidates regardless of their gender, nationality, ethnic and social origin, religion, disability, age, sexual orientation and identity.

The position is available from 1 February 2027 on a full-time basis (39,83 hours per week). The position is to be filled for a fixed term until 31 July 2030. If the applicant meets the relevant wage requirements and personal qualifications, the salary is based on remuneration group 13 TV-L of the pay scale for the German public sector.

Please apply online with proof of the required qualifications without photo under: <https://jobportal.uni-koeln.de>. The reference number is Wiss2609-13. The application deadline is 25.10.2026.

For further inquiries, please contact Dr Mario Mech (mario.mech@uni-koeln.de) or Professor Dr Susanne Crewell (susanne.crewell@uni-koeln.de) and take a look at our [FAQs](#).



HR EXCELLENCE IN RESEARCH