The Institute for Atmospheric Physics at
Johannes Gutenberg University Mainz invites applications for a

PhD position (m/f/d)

funded within the Transregional Collaborative Research Centre 301

TPChange – The Tropopause Region in a Changing Atmosphere

by the German Research Foundation (DFG, Deutsche Forschungsgemeinschaft).

Within TPChange we aim to improve the understanding of relevant multiscale processes in the tropopause region and to specify their impact on composition, dynamics and ultimately on future climate and climate variability. The PhD candidate will work in project B01

Exchange of humidity and aerosol particles at the tropopause: Dynamics versus moist diabatics and radiation

In this project, it is planned to apply the novel airborne approach based on a towed sensor shuttle (TPC-TOSS) behind a fully equipped research aircraft. The measurements include simultaneous measurements of relative humidity, temperature, ozone, aerosol size distribution as well as potential temperature at two different altitudes. With this setup we will identify the effect of diabatic processes at the tropopause on the chemical and thermodynamical structure of the tropopause region. We will particularly search for mixing associated with the transient evolution of frontal uplift and the associated cirrus decks at the tropopause as well as regions downwind of strong shear to study their impact on composition gradients.
The candidate will be deeply involved in the preparation of the payload for the towed sensor shuttle, which has already been successfully flown in 2024. It is planned that the candidate will be particularly responsible for the ozone instruments on the TPC-TOSS and aircraft as well as for the thermodynamics state parameters. The phd will further operate a laser spectrometer during the measurement campaign onboard the main aircraft to measure carbon monoxide and nitrous oxide.
The candidate will use analysis and reanalysis data as well as backward trajectory analysis provided by Prof. A. Miltenberger to put the measurements in the physical context of conditions relevant for cross tropopause exchange. Together with the second phd working on the chemical modeling supervised by Prof. H. Tost, the candidate will be involved in the flight planning and the scientific evaluation of the data. Both candidates are expected to jointly participate in the campaign. After the measurement phase it is expected, that both phds closely collaborate to perform the scientific analysis of the data by combining the observation with the modeling results to put the data into a larger perspective of extratropical cross tropopause exchange. The final goal is to identify the impact of small scale processes related to typical mid-latitude spring time cyclonic system for the composition of the tropopause region and the formation of the extratropical transition layer.

Requirements

The ideal candidate holds a MSc in natural sciences (particularly physics, meteorology, chemistry) and has a strong background in experimental work. Scientific data analysis using Phyton is of advantage. We expect the candidate to work in a team of experts requiring strong communication skills.

Employment conditions

The wage classification of the job is EG 13 TV-L (75 %) and the place of employment will be Mainz. The targeted starting date is 1st January 2026 and the project will last until 30th June 2029.

Applications and deadline

Please send applications with reference to the code **B01-PHD1-JGU** as one single pdf file to **tpc_jobs@uni-mainz.de**, including a motivation letter for your preferred project, CV, copies of relevant certificates, preferred starting date, and potential references.
Review of all applications will start on **4th December 2025** and will continue until the position is filled.
For further information, please contact Prof. Dr. Peter Hoor (hoor@uni-mainz.de).

TPChange offers a comprehensive and structured training for early career researchers. In addition to self-organised activities such as workshops, trainings and a guest program, the successful candidate will have the opportunity, if desired, to pursue international research visits. The consortium conducts an ambitious program to gradually enhance gender equality on all career levels.
The Johannes Gutenberg University Mainz actively supports equality, diversity and inclusion, and as an equal opportunity employer. Johannes Gutenberg University Mainz explicitly encourages applications from women as well as from all others who will bring additional diversity to the university's research and teaching. Applicants with disabilities will be preferentially considered if suitably qualified.

We look forward to your application!