

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

## PhD positions (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 candidates will work in project B08

## Lagrangian analysis of role of extratropical cyclones for UTLS aerosol/humidity

Extratropical cyclones are linked to organised, large-scale ascent of air masses that transport water vapor, trace gases, and aerosol particles from the lower to the upper troposphere. While the importance of this transport qualitatively is undebated, quantitative understanding of the impact for the composition of the upper troposphere / lower stratosphere region (UTLS) is not available. The ascent is often associated with cloud formation and cloud processes will strongly modify the transported moisture, aerosols, and trace gases. In this project we will quantitatively investigate the transport and related cloud microphysical processes for selected case-studies from a measurement campaign conducted within TPChange (PhD position 1) and from a climatological perspective (PhD position 2). In both project parts, we will utilise simulations of extratropical cyclones with an advanced numerical weather prediction model (ICON) and trace the evolution of individual air parcels with high-resolution air parcel trajectories. While PhD1 will focus in particular on understanding and constraining the uncertainty in the modelled transport due to the model representation of cloud microphysics, PhD2 will focus on understanding environmental controls on the transport as well as its modification due to climate change. In addition to a strong modelling component, both PhD candidates will work extensively with observational data in close collaboration with TPChange project partners from JGU Mainz, GU Frankfurt, FZ Jülich, and DLR. In addition to being embedded in TPChange, PhD candidates will belong in the research group “theoretical cloud physics” lead by Prof. Peter Spichtinger (<https://theoryofclouds.ipa.uni-mainz.de/>). The primary supervisor of both PhD candidates will be Dr. Annette Miltenberger.

### Requirements

The ideal candidate holds a MSc in Meteorology, Physics, or a related field. The candidate should ideally have some experience with numerical modelling and analysis of large data sets, preferentially in a Linux/UNIX environment and with a high-level programming language (e.g. Fortran, python). Interest and background knowledge in atmospheric dynamics and cloud microphysics would be of advantage.

### Employment conditions

The position is offered for 4 years and the place of employment will be Mainz. The targeted starting date is 1 July 2021.

### Applications and deadline

Please send applications with reference to the code **B08-PHD1-JGU/ B08-PHD2-JGU** as one single pdf file to [tpc\\_jobs@uni-mainz.de](mailto:tpc_jobs@uni-mainz.de), including a motivation letter including your preferred project part, CV, copies of relevant certificates, preferred starting date, and the names of at minimum two references.

Review of all applications will start on **1 June 2021** and will continue until the position is filled.

For further information, please contact [amiltenb@uni-mainz.de](mailto:amiltenb@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 actively supports equality, diversity and inclusion, and as an equal opportunity employer, Johannes Gutenberg University 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!

### **Notes on Data Protection**

<https://www.verwaltung.personal.uni-mainz.de/files/2020/09/Datenschutz-BewerberInnen.pdf>