The Institute for Atmospheric Physics at

Johannes Gutenberg-Universität 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 C01**

Life Cycle of Ice Supersaturated Regions in the UTLS

Ice-supersaturated regions (ISSRs) are key environments for the formation of ice clouds and aircraft contrails, which are important for understanding and mitigating aviation's climate impact. Building on the results of the first project phase, the next phase will focus on analysing the 3D geometry and lifecycle of ISSRs using ERA5 reanalysis data. The project aims to extend earlier two-dimensional fractal analyses to three dimensions and to develop a 3D tracking algorithm capable of handling object splitting, merging, and classification.
A major goal is to distinguish between cloud-free and in-cloud ISSRs using physically based thresholds and observational data from campaigns such as TPEx and IAGOS. Combining these analyses with advanced machine learning methods will enable a better understanding of ISSR formation, persistence, and transitions to natural clouds, providing new insights into upper-tropospheric humidity processes and their role in climate.
The project is supervised by Dr. Philipp Reutter and Prof. Dr. Peter Spichtinger and will be carried out in close collaboration with other groups within the CRC/TRR TPChange focusing on cloud microphysics, radiative effects, and modelling. Further collaborations are planned with international partners such IAGOS.

Requirements

The ideal candidate holds an MSc degree (or equivalent) in meteorology, atmospheric science, physics, data science, or a related field. A basic background in atmospheric dynamics and thermodynamics as well as skills in data analysis and scientific programming (preferably Python or Julia) are required.

The successful candidate should have good communication skills in English, a high level of motivation and scientific curiosity, and the ability to work both independently and in a team within the CRC/TRR TPChange research environment.

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 **C01-PHD-JGU** as one single pdf file to **tpc_jobs@uni-mainz.de**, including a motivation letter including your research interests and your preferred project, a CV with details of your academic background and relevant experience, copies of relevant certificates and transcripts, the contact information of at least one academic reference and your preferred starting date.
Review of all applications will start on **4th December 2025** and will continue until the position is filled.
For further information, please contact preutter@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 Institute for Atmospheric Physics actively supports equality, diversity and inclusion, and as an equal opportunity employer, Institute for Atmospheric Physics 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!