The Institute of Climate and Energy Systems – Troposphere (ICE-3) at Forschungszentrum Jülich 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 A04:

Composition and transport of aerosol particles in the upper troposphere and lower stratosphere (UTLS) and their interactions with cirrus clouds

Aerosol particles act as ice nucleating particles, providing surface for water vapour to deposit and freeze into ice particles. Formation of cirrus clouds and subsequent sedimentation of ice crystals can dehydrate air in the upper troposphere and lower stratosphere (UTLS) region, thereby influencing the water vapour budget of this region. Aerosols and cirrus are important to the global climate because they interact with radiation from the sun and from the earth. However, the aerosol-cirrus interaction in the UTLS is not well understood because of lacking corresponding in situ measurements. In addition, the dynamics and transport processes across the UTLS adds complexity to unveil the role of UTLS aerosols in cirrus formation and the life cycle of cirrus. Therefore, it is crucial to measure aerosol composition and properties together with cirrus occurrences in the UTLS for achieving a better understanding of the link between aerosols and cirrus clouds in the UTLS, for which Lagrangian modelling is a valuable tool to revealing the source of UTLS aerosols, the origin of water masses, and formation processes of cirrus particles.

This PhD position focuses on the analysis and interpretation of aerosol and cirrus data to be collected from the TPEx-II research aircraft campaign of TPChange. Tasks of the PhD project are:

- Preparation, operation, and calibration of aerosol, water vapour and cloud instruments through the research aircraft campaign
- Flight planning for aerosol and cirrus measurement missions using Lagrangian modelling
- Evaluation and interpretation of in-situ measurement data aided by Lagrangian trajectory calculations
- Presentation of results in international conferences and publication in peer-reviewed journals

The PhD student will closely collaborate with two other PhD students of A04 located in the Max Planck Institute for Chemistry (MPIC) and the Goethe University Frankfurt (GUF) on the tasks described above. Furthermore, we collaborate with many other projects of TPChange, especially during the aircraft-based measurements, on data exchange and scientific interpretation of the results.

Requirements

The following requirements are for the ideal candidate:

- Master’s degree in meteorology, physics, environmental science or similar
- Good experimental skills and interest in working with custom-built or modified instruments
- Solid programming skills (e.g. Python) are desirable

- Ability to work in a team
- Knowledge of atmospheric dynamics and chemistry would be an advantage

Employment conditions

The place of employment will be Jülich. The targeted starting date is 1st January 2026 and the project will last until 30th June 2029. The salary and social benefits are based on the labour agreement for the public sector employment (TVöD).

Applications and deadline

Please send applications with reference to the code **A04-PHD2-FZJ** as one single pdf file to **tpc_jobs@uni-mainz.de**, including a motivation letter including your preferred project, CV, copies of relevant certificates, preferred starting date, and the names of at minimum two references.
Review of all applications will start on **4th December 2025** and will continue until the position is filled.
For further information, please contact Yun Li (yun.li@fz-juelich.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.
ICE-3 actively supports equality, diversity and inclusion, and as an equal opportunity employer, ICE-3 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!