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 A03

Aerosol nucleation in the upper troposphere

In this project, we will use a combination of in-situ measurements with modelling on different scales (employing several nested domains) to investigate, how new particles are formed in the upper troposphere. The focus is on the role of organic substances involved in the new particle formation and condensation in the early stages of the particle size distribution evolution. Consequently, both aerosol processes as well as gas phase chemistry of the precursors play a central role for this project. The PhD candidate on this position is expected to perform model simulations both with a detailed box model as well as regional scale simulations to
a) evaluate the model performance and applicability of existing parameterisations for new particle formation which will be evaluated with aircraft campaign data acquired in this project (co-operation with GUF PhD candidate) and other already existing aerosol data from the UTLS.
b) additionally, the (convective) transport of precursors for the particle formation will be subject to analysis to determine the relevance of individual compounds and their characteristics (e.g. solubility and subject to scavenging).
The candidate is expected to closely collaborate with the experimental group with Prof. Curtius at GUF, but also to provide aerosol related regional scale model results supporting the experimental activities in the projects B01, B02, and A04 with simulation results and respective analysis. Similarly, a collaboration with C06 and A07 is anticipated.
The main focus of this project is on aerosol and precursor analysis as well as understanding the processes and conditions which lead to new particles in the UTLS, as well as their fate and role for the aerosol and CCN and IN budgets in the troposphere.

The candidate is expected to perform chemistry model simulations with the global-to-regional modelling system MECO(n), which is based on the COSMO weather forecast model linked with the Modular Earth Submodel System (MESSy) to account for chemistry and aerosol processes. This also includes further development of the modelling systems to implement and improve the representations of the relevant processes.
The PhD candidate will be jointly supervised by Prof. Tost and Prof. Curtius and supported by a scientific programmer from the Z03 project. Additional support from the working group of Prof. Tost will be provided and a strong exchange with other modelling projects within the CRC is expected (especially B01), as well as the integration in the German Chemistry-Climate modelling initiative centered around the MESSy infrastructure.

Requirements

The ideal candidate holds a MSc in natural sciences (particularly meteorology, physics, computer sciences or chemistry) and has a strong background in scientific model application. Knowledge of a higher programming language and a high interest in atmospheric chemistry/aerosol particles is required. Experience with FORTRAN

and atmospheric modelling is appreciated. We expect the candidate to work in a team of experts requiring strong communication skills (in English language).

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 the reference code **A03_PHD1_JGU** as one pdf-document to tpc_jobs@uni-mainz.de, including a motivation letter, 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 Prof. Dr. Holger Tost.

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.
JGU actively supports equality, diversity and inclusion, and as an equal opportunity employer, JGU 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