Open PhD position at KIT on “Dynamical system perspective on weather regimes and temperature extremes in Europe in a changing climate“ within ClimXtreme2 consortium

Karlsruhe Institute of Technology (KIT), Institute of Meteorology and Climate Research

KIT is a distinguished research university that combines three core tasks – research, education and innovation – into a single mission. With 9,300 employees and almost 25,000 students, it is one of the largest institutions of research and higher education in natural sciences and engineering in Europe. KIT was awarded the title "University of Excellence" within the German Excellence Strategy launched by the federal and state governments on 19 July 2019. In the area of Atmospheric Science, KIT was ranked #1 in Germany and #8 worldwide in the 2019 Shanghai Ranking.


One of the large projects where we are involved in is BMBF “Climate Change and Weather Extremes in Europe: Building a knowledge base for decision support“ – Phase 2 (ClimXtreme2). In the second phase of the program, the improved climate knowledge in terms of the understanding and the statistical assessment of extreme weather events under past, present and future climate conditions shall be further developed into a basis for decision making. Emphasis is given to the quantification of uncertainty, extreme risks and the role of human activities for the extreme events. Modul B focusses on Statistics.

We have one open PhD position for a period of 3 years within the ClimXtreme2 – Module B.

PhD Topic: We analyse how changes in large-scale flow regimes under climate change affect the characteristics of heat waves in Central Europe. Specifically, we analyze how the life cycles of Atlantic-European weather regimes are influenced by climate change using dynamical system theory using ERA5 reanalysis and CMIP6 models for the historical period. In a second step, we statistically analyze future projections of the same CMIP6 models to assess how weather regime characteristics may change in the future, particularly regarding the possible changes in transition probabilities between weather regimes, their predictability and persistence, and its influence on heat waves. With this approach, we assess in how far changes in weather regime characteristics under climate change are responsible for the modifications of the statistical properties of extreme high temperatures in Central Europe.

The KIT PI is Prof. Dr. Joaquim Pinto, with Dr. Sebastian Buschow as co-PI (Uni-Bonn). Collaborations are planned with Dr. Christian Grams (MeteoSwiss, Switzerland), Prof. Dr. Gabriele Messori (Uni-Uppsala, Sweden) and Dr. Assaf Hochman (HUJI, Israel)

The project is planned to start on October 1st, 2023, pending the formal acceptance letter from the BMBF.

Requirements: A MSc in Meteorology, Climate Science, Earth Sciences, or related disciplines. The applicant must be proficient in spoken and written English.
Additional qualifications: For this position, experience in statistics, extreme event diagnostics and scientific programming (e.g., linux, python, fortran, idl, ncl, cdo, Matlab, R) is beneficial. German language skills are helpful but not mandatory.

The application should contain (all in one PDF):

- A Curriculum Vitae.
- A cover letter stating your scientific interests and what motivates you to apply for this position.
- A list of scientific publications.
- Contact details (incl. email and telephone number) of two references.

The candidates will be short-listed based on the materials in the application, the top ranked candidates will be interviewed digitally and the references will be collected.

Salary: The remuneration is based on the collective agreement of the public service in the remuneration group TVL E13.

Starting date: Ideally 15-10-2023 or 01-11-2023, or as otherwise agreed.

Terms and conditions of employment: The group is based on the research campus of KIT located about 10 km to the North of Karlsruhe city centre.

Scope of employment: 75% (PhD position)

For further information about this position please contact: Joaquim Pinto (joaquim.pinto@kit.edu) and Sebastian Buschow (sebastian.buschow@uni-bonn.de)

Please send the documents requested above for the application all in one pdf file by 04 September 2023 to both PIs to the above e-mails, clearly stating in the subject which position you are applying to.

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

Are you considering moving to Germany to work at KIT? If so, you will find a lot of information about working and living in Germany at http://www.intl.kit.edu/ischolar/index.php. You are also welcome to contact the International Scholars & Welcome Office at scholar@intl.kit.edu.