

ERC-funded PhD position in atmospheric turbulence in mountainous terrain

The [Atmospheric Turbulence](#) group of the Department of Atmospheric and Cryospheric Sciences ([ACINN](#)) at the University of Innsbruck (Austria) invites applications for a PhD position on Near-surface atmospheric turbulence in mountainous terrain using machine learning.

The successful candidate will work as part of the ERC Consolidator Grant “Developing a novel framework for understanding near-surface turbulence in complex terrain (Unicorn)”, led by Prof. Ivana Stiperski. Unicorn aims to

- (i) understand the processes that cause differences between turbulence in flat and mountainous terrain, and
- (ii) develop approaches that extend similarity theory to complex terrain.

Similarity theory is the basis of our understanding of turbulence over flat and horizontally homogeneous terrain. Similarity theory is also used in numerical weather prediction models to parametrize the exchange of heat, moisture, and momentum between the ground and the atmosphere. However, measurements have consistently shown that turbulence characteristics over mountains depart from those over flat terrain so that similarity theory is not valid and the parametrizations are therefore inadequate.

The objective of the PhD project is to assess the influence of different aspects of terrain complexity on the breakdown of similarity scaling over mountainous terrain, using machine learning approaches on measurements from a large number of readily available datasets. The PhD student will work on evaluating similarity theory over complex terrain, and use machine learning to isolate the dominant sources of terrain complexity that cause the departures from scaling.

The position is initially awarded for one year and will be extended to a total duration of 3 years after positive evaluation. The preferred starting date is **1 July 2021 or as soon thereafter**. Remuneration will be based on the Austrian collective agreement for university employees (representative figures are provided by the Austrian Science Fund, <https://www.fwf.ac.at/en/research-funding/personnel-costs/>).

Essential qualifications: Master degree in Meteorology/Atmospheric science, Physics, Mathematics, Statistics or Computational fluid dynamics (or being close to completion); good knowledge of statistics; demonstrated proficiency in Python, R, Matlab, or a similar programming language; experience with Linux/UNIX environments; excellent oral and written communication skills in English; strong motivation, curiosity and creativity; ability to work independently and as part of a team.

Assets: Knowledge of the atmospheric boundary layer and of mountain meteorology; experience with high-performance computing.

Applications received before Sunday, **25 April 2021**, will be given full consideration. The application package should be submitted via e-mail to Ivana Stiperski (ivana.stiperski@uibk.ac.at) and should include the following information:

- A curriculum vitae

- A formal letter of motivation, stating your interest and qualifications for the position
- Degree transcripts and master thesis abstract
- Contact information for one to three referees.

University of Innsbruck aims at increasing the proportion of women at all employment levels, and therefore the **applications by qualified women are especially encouraged**.

ACINN is the leading center for studying the influence of mountains on the atmosphere at scales ranging from climatic to turbulence. The PhD student will be incorporated into the doctoral program [Mountain Climate and Environment](#).

Candidates who wish to receive further details about the position are welcome to contact Prof. Ivana Stiperski per e-mail.