PhD position at the University of Vienna (Austria), ensemble data assimilation and mountain meteorology

The Theoretical Meteorology group of the Department of Meteorology and Geophysics (IMGW) at the University of Vienna (Austria) is looking to fill a doctoral position in the field of numerical weather prediction.

The PhD student will join a dynamic group led by Prof. Martin Weissmann. The position is sponsored by the Austrian Science Fund (FWF) through project P 37259-N, "DEPENDABLE: Demonstrating parameter estimation with ensemble-based data assimilation", led by the principal investigator Dr. Stefano Serafin.

The project focuses on a specific component of numerical weather prediction models, namely the parameterization of atmospheric turbulence. The main objective is to test a novel method for reducing the forecast error related to turbulence parameterizations, which is particularly pronounced over mountainous areas. In particular, the PhD candidate will estimate the uncertain empirical parameters of turbulence parameterizations with an ensemble data assimilation methodology. The research work consists of:
(i) running large-eddy simulations of the mountain boundary layer with grid spacing of 100 m or less;
(ii) using large-eddy simulation output to generate synthetic atmospheric observations (surface and profile measurements);
(iii) assimilating the synthetic observations in an ensemble analysis that resolves the convective scale at a grid spacing of 1 km;
(iv) upgrading the assimilation algorithm to permit parameter estimation;
(v) analysing parameter estimation results.

The main working tools are the weather prediction model WRF and the data assimilation code DART. The expected outcome is a demonstrated improvement in the accuracy of meteorological analyses and forecasts over mountains.

The position is initially awarded for one year and will be extended to a maximum duration of 3 years after positive evaluation. The starting date is not earlier than **1 March 2024**. Remuneration is determined by the Austrian collective agreement for university employees. Indicative figures are provided on the funding agency website.

Essential qualifications: Master (or equivalent) degree in meteorology, physics or a related subject; demonstrated proficiency in Python and Fortran programming; familiarity with Linux/UNIX environments; strong motivation; positive attitude toward teamwork; excellent verbal and written communication skills including fluency in English.

Assets: Basic experience with numerical weather prediction codes; knowledge of data assimilation methods; familiarity with high-performance computing. Knowledge of the German language is beneficial but not required.

Applications received before Sunday, **25 February 2024**, will be given full consideration. Applications should be submitted via e-mail to Dr. Stefano Serafin, stefano.serafin[at]univie.ac.at, and should include the following information in a single pdf file:

- A formal letter of motivation, explaining in no more than 300 words the reasons why you are interested in the position and why you believe you are an excellent candidate for it;
- A curriculum vitae;
- Contact information for referees (at least one, no more than three);
- Degree transcripts and master thesis abstract;
- Publications, if any.

The University of Vienna aims at increasing the proportion of women at all employment levels, and therefore encourages applications by qualified women.

Candidates wishing to receive further details about the position are welcome to contact Dr. Serafin via e-mail.