



The Institute for Geosciences, Department of Meteorology, of the University of Bonn invites applications for a

### **Position as Research Associate or Software Engineer (100% E13 TV-L)**

within the second funding phase of the DFG research unit 2589 „Near-Realtime Quantitative Precipitation Estimation and Prediction“ (RealPEP, <https://www2.meteo.uni-bonn.de/realpep>). RealPEP thrives to achieve significant improvements at all stages along the process chain from Quantitative Precipitation Estimation (QPE), Precipitation Nowcasting (QPN), numerical prediction of quantitative precipitation (QPF) and predicting discharge and potential flash floods in small- to meso-scale catchments (FFP).

The announced position is designed to 1) build and maintain the **data collection and exploitation platform**, which combines all cloud and precipitation-related observations and algorithms developed in the research unit, and 2) set up a **predictive recurrent neural network for radar-based nowcasting**, i.e. the prediction for the next 1-3 hours. The starting point of 1) is a C++ processing framework developed at the German national weather service (Deutscher Wetterdienst, DWD). The successful candidate will enable the framework to digest different data sources and extend it with tools developed in the research unit related especially to QPE and QPN. The developed deep learning system based on a recurrent neural network 2) will be investigated as an alternative to the ensemble nowcasting algorithms developed by colleagues of the research unit to conclude on the best approach.

The position will be based at the Department of Meteorology of Bonn University, Auf dem Hügel 20, Germany, an internationally known facility for radar research operating in cooperation with Forschungszentrum Jülich GmbH two research polarimetric X-band Doppler weather radars.

### **Requirements**

We welcome applicants preferably with a Masters degree or PhD in computer sciences, meteorology or physics, strong programming skills in C++ and experience with deep learning systems. The candidate should be interested to work at the verges of computer sciences and radar meteorology and is expected to closely cooperate with other scientists in the research unit including also colleagues at DWD, Forschungszentrum Jülich, Free University Berlin, and KIT-Alpine in Garmisch-Partenkirchen. The position will be offered for 3 years with possible extension for another year starting as soon as possible.

### **Applications**

Interested candidates should send a CV, a cover letter describing motivation, background, training and research interests, certificates, and the contact information of two persons, which can be asked for references, as a single PDF of less than 5MB to [silke.troemel@uni-bonn.de](mailto:silke.troemel@uni-bonn.de).

**Applications are reviewed until the position is filled.**

### **Selection**

The selection for the positions will be based solely on merit without regard to gender, religion, national origin, political affiliation, marital or family status or other differences. Among equally qualified candidates, handicapped candidates will be given preference.



**INSTITUT FÜR GEOWISSENSCHAFTEN,  
ABTEILUNG METEOROLOGIE,  
DER RHEINISCHEN  
FRIEDRICH-WILHELMS-UNIVERSITÄT BONN**



The Institute for Geosciences, Department of Meteorology, of the University of Bonn invites applications for a

**Position as PhD student (75% E13 TV-L)**

within the second funding phase of the DFG research unit 2589 „Near-Realtime Quantitative Precipitation Estimation and Prediction“ (RealPEP, <https://www2.meteo.uni-bonn.de/realpep>). RealPEP thrives to achieve significant improvements at all stages along the process chain from Quantitative Precipitation Estimation (QPE), Precipitation Nowcasting (QPN), numerical prediction of quantitative precipitation (QPF) and predicting discharge and potential flash floods in small- to meso-scale catchments (FFP). RealPEP will rely on a multi-sensor data exploitation platform to monitor the precipitation generating atmosphere and tackle urgent science questions to better identify mechanisms that determine the onset, location, intensity, and development of precipitating systems. Developments will be implemented for near-realtime processing in order to be able to mitigate risks to society and ecosystems.

The successful candidate will further develop, in close collaboration with the research unit, a novel precipitation ensemble nowcasting system, which exploits scaling properties of precipitation and precipitation-generating process information derived from polarimetric radars and satellites. A nationwide system based on the spatio-temporal scaling behaviour of precipitation has been implemented already and assessed. In the next step polarimetric radar signatures indicative for potential changes in precipitation generation (e.g. columns of enhanced differential reflectivity, so-called  $Z_{DR}$ -columns) will now be exploited for refinements of the approach. A predictive recurrent neural network (PredRNN) will be used to link satellite-based information on cell initiation with their subsequent development monitored by radars.

The position will be based at the Department of Meteorology of Bonn University, Auf dem Hügel 20, Germany, an internationally known facility for radar research operating in cooperation with Forschungszentrum Jülich GmbH two research polarimetric X-band Doppler weather radars.

**Requirements**

We welcome applicants preferably with a Masters degree in meteorology or physics and a background in radar polarimetry and/or cloud microphysics. Proficient English language skills in oral and written communication are required. It is expected that the candidate closely cooperates with other scientists in the research unit including also colleagues at the German national weather service (Deutscher Wetterdienst, DWD), Forschungszentrum Jülich GmbH, Free University Berlin, and KIT Campus Alpine in Garmisch-Partenkirchen. The position will be offered for 3 years starting as soon as possible.

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