

# Collaborative Research Center “Waves to Weather”

## PhD positions

Our ability to predict the weather up to a week or more ahead saves our societies billions of Euros annually and protects human life and property. The great challenge today is to identify the limits of weather predictability in different situations and produce the best forecasts that are physically possible. The Collaborative Research Center “Waves to Weather” (CRC 165; W2W) is conceived to meet this challenge and to deliver the underpinning science urgently needed to pave the way towards a new generation of weather forecasting systems.

During the first funding phase (2015-2019), fundamental discoveries were made regarding the mechanisms of error growth, and new methods were developed to quantify the uncertainty resulting from incomplete knowledge of cloud processes. Furthermore, innovative statistical and visualization tools were implemented to characterize uncertainty in ensemble prediction systems. In the second funding phase (2019-2023) we take the next step to identify when and where intrinsic limitations on predictability have greatest impact on forecast skill, by applying the methods developed in Phase 1 to a wide range of real weather events. But we will go beyond this by investigating how best to make probabilistic forecasts in situations where the overall predictability is low. New methods will be developed to combine statistical and dynamical information, and a new research focus has been added to consider the effects of cyclone interactions and regime transitions at forecast lead times of up to a month.

The W2W consortium consists of:

- the Ludwig-Maximilians-Universität (LMU) in Munich
- the Johannes Gutenberg-Universität (JGU) in Mainz
- the Karlsruher Institut für Technologie (KIT) in Karlsruhe
- the Technische Universität München (TUM)
- the Deutsches Zentrum für Luft- und Raumfahrt (DLR) in Oberpfaffenhofen
- the Ruprecht-Karls-Universität (RKU) in Heidelberg
- the Universität Hamburg (UHH).

The consortium features an innovative program for the development of early career researchers within a strong network of experienced colleagues and conducts an ambitious program to gradually enhance gender equality on all career levels within the academic fields combined in W2W.

The following positions are available within the W2W consortium:

- 19 PhD positions: 18 PhD positions part-time (75%) at the salary grade E13 TV-L and 1 PhD position full-time at the salary grade E13 TV-L
- 1 Postdoc position full-time at the salary grade E13 TV-L
- 2 scientific programmer positions full-time at the salary grade E13 TV-L

Applicants are asked to refer to one of the following topics:

- \* Project A1 “Multi-scale analysis of the evolution of forecast uncertainty” (M. Riemer, JGU) (A1a)
- \* Project A1 “Multi-scale analysis of the evolution of forecast uncertainty” (H. Tost, JGU) (A1b)
- \* Project A3 “Model error and uncertainty at the midlatitude tropopause” (A. Schäfler (DLR),

M. Weissmann and G. Craig (LMU))

- \* Project A6 "Representing the evolution of forecast uncertainty" (G. Craig, LMU) (A6a)
- \* Project A6 "Representing the evolution of forecast uncertainty" (C. Keil, LMU) (A6b)
- \* Project B1 "Microphysical uncertainties in hailstorms using statistical emulation and stochastic cloud physics" (A. Miltenberger, JGU) (B1b)
- \* Project B3 "Sources of uncertainty for convective-scale predictability" (C. Keil, LMU) (B3a)
- \* Project B3 "Sources of uncertainty for convective-scale predictability" (C. Barthlott, KIT) (B3b)
- \* Project B4 "Radiative interactions at the NWP scale and their impact on midlatitude cyclones predictability" (B. Mayer, LMU) (B4a)
- \* Project B4 "Radiative interactions at the NWP scale and their impact on midlatitude cyclones predictability" (B. Mayer, LMU) (B4b)
- \* Project B4 "Radiative interactions at the NWP scale and their impact on midlatitude cyclones predictability" (A. Voigt, KIT) (B4c)
- \* Project B6 "New data assimilation approaches to better predict tropical convection" (P. Knippertz and C. Hoose, KIT) (B6)
- \* Project B8 "Role of uncertainty in ice microphysical processes in warm conveyor belts" (C. Hoose and C. Grams, KIT) (B8)
- \* Project C2 "Statistical-dynamical forecasts of tropical rainfall" (A. H. Fink, KIT) (C2)
- \* Project C3 "Predictability of tropical and hybrid cyclones over the North Atlantic Ocean" (E. Schömer, JGU) (C3)
- \* Project C4 "Predictability of European heat waves" (V. Wirth, JGU) (C4a)
- \* Project C5 "Statistical postprocessing of ensemble weather predictions" (S. Lerch, KIT) (C5)
- \* Project C8 "Stratospheric influence on predictability of persistent weather patterns" (J. Pinto, KIT) (C8a)
- \* Project C8 "Stratospheric influence on predictability of persistent weather patterns" (H. Garny, DLR) (C8b)
- \* Project C9 "Visual feature analysis from individual cases to collections of ensembles" (M. Rautenhaus, UHH) (C9)
- \* Project Z2 "Computing services" (G. Craig, LMU) (Z2a)
- \* Project Z2 "Computing services" (M. Rautenhaus, UHH) (Z2b)

Responsibilities and requirements depend on the project and are outlined on the website <http://www.wavestoweather.de/positions/>. The positions are fixed-term employment contracts. Contracts are time-limited according to the Academic Fixed-Term Contract Law (WissZeitVG). The salary scale is TV-L E13. Employment in all positions shall begin as soon as possible (funding is available to start July 1<sup>st</sup> 2019).

Handicapped applicants will be given preference in case of equal suitability. The W2W consortium strives to increase the proportion of women in research and specifically encourages females to apply for these positions.

Applications should be submitted online before June 30<sup>th</sup> 2019, or until all positions are filled, using the application tool of the W2W consortium (visit <http://www.wavestoweather.de/positions/> for more information) and should include the following components:

- CV
- letter of motivation
- research interests
- a record of studies

- master and bachelor certificates including a transcript of records
- for the Postdoc positions, doctoral experience
- the degree certificates
- contact information of two referees for letters of recommendation
- an English language certificate

For further information, please visit <http://www.wavestoweather.de> or contact Dr. Audine Laurian ([audine.laurian@lmu.de](mailto:audine.laurian@lmu.de)).

All the best,  
Audine Laurian

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