



UNIVERSITÄT
LEIPZIG

Three PhD Positions (m/f/x) on:

- 1. Deep Learning for Vegetation Parameter Retrieval from Spectral Data**
- 2. Reservoir Computing Predicts Ecosystem Anomalies**
- 3. Understanding Forest Stress from High-dimensional Data Cubes**

all limited to 3 years; commonly used PhD pay grades in the German public sector apply. Starting dates 6 weeks after selection - all positions remain open until a suitable candidate has been identified.

The newly established **Remote Sensing Centre for Earth System Research (RSC4Earth, <https://rsc4earth.de/>)** - a joint initiative of the **Faculty of Physics and Earth Sciences at Leipzig University** and the **Helmholtz Centre for Environmental Research - UFZ** conduct innovative research to advance the understanding of the Earth system via integration of various remote sensing, data science, and process-oriented modelling techniques. RSC4Earth has extensive research experience in quantifying land surface dynamics from multi-source Earth observations across scales.

(1) The PhD project “Deep Learning for Vegetation Parameter Retrieval from Spectral Data” aims to explore AI approaches for an efficient and accurate modelling of biophysical and biochemical vegetation properties based on spectral data. The project will be in close collaboration with the Leipzig Center for Scalable Data Analytics and Artificial Intelligence (ScaDS.AI) and contribute to our ongoing research in remote sensing for biodiversity monitoring. Requirements are:

- Enthusiasm for remote sensing applications in ecology
- Proficiency in handling spectroscopic data (i.e. imaging and non-imaging hyperspectral data)
- Good programming / scripting skills (preferably in R, Python, Julia or Matlab)
- Experience in multivariate statistics, deep and machine learning, EO data processing or vegetation ecology
- Good communication skills in English, and strong interest to work in an interdisciplinary research team
- Willingness to communicate your research through peer-reviewed publications and scientific meetings

Specific questions about this project should be addressed to Prof. Hannes Feilhauer (hannes.feilhauer@uni-leipzig.de) and Dr. Teja Kattenborn (teja.kattenborn@uni-leipzig.de). The project will be carried out at ScaDS.AI Leipzig and the RSC4Earth group led by Prof. Feilhauer.

(2) The PhD project “Reservoir Computing Predicts Ecosystem Anomalies” seeks to investigate the machine learning method of reservoir computing (a recurrent neural network with a specific structure) to predict complex ecosystem dynamics, tipping points, and extremes. The project will be in close collaboration with the Leipzig Center for Scalable Data Analytics and Artificial Intelligence (ScaDS.AI) and contribute to our ongoing research in the Earth System Data Science group. Requirements are:

- Enthusiasm for understanding the complexity of Earth system dynamics
- Proficiency in multivariate statistics, machine learning, optimisation
- Interest in learning about dynamical systems
- Good programming / scripting skills (Python, Julia, R or Matlab)
- Experience in handling Earth observation data is an asset
- Good communication skills in English, and strong interest to work in an interdisciplinary research team
- Willingness to communicate your research through peer-reviewed publications and scientific meetings

Specific questions about project 2 should be addressed to Dr. Karin Mora (karin.mora@uni-leipzig.de). The project will be carried out at ScaDS.AI Leipzig and Earth System Data Science group led by Prof. Dr. Miguel Mahecha.

(3) The PhD project “Understanding Forest Stress from High-dimensional Data Cubes” aims at co-interpreting multiple remote sensing data streams and in-situ observations using state-of-the-art machine learning approaches to predict major impacts of climate extremes on forests. The PhD project will contribute to a multi-sourced “Digital Forest” with an emphasis on the Hainich national park and other protected forests. Requirements are:

- Enthusiasm for remote sensing applications in ecology
- Proficiency in handling state-of-the-art remote sensing data (i.e., Sentinel 2, ideally also Sentinel 1 data, and other relevant RS data)
- Good programming / scripting skills (R, Python or Julia)
- Experience in multivariate statistics, deep learning or EO data processing are advantageous
- Good communication skills in English, and strong interest to work in an interdisciplinary research team
- Willingness to communicate your research through peer-reviewed publications and scientific meetings

Specific questions about project 3 should be addressed to Dr. Sebastian Wieneke (sebastian.wieneke@uni-leipzig.de) and Guido Kraemer (guido.kraemer@uni-leipzig.de). The project will be carried out at the RSC4Earth (<https://rsc4earth.de/>) in the Earth System Data Science group led by Prof. Dr. Miguel Mahecha and in close collaboration with the University of Göttingen (<https://www.uni-goettingen.de/en/635968.html>).

A prerequisite for all positions is a **M.Sc. in any relevant branch of the natural sciences** - from biology, ecology, to applied computer sciences, mathematics or physics. We explicitly welcome applications from abroad. Leipzig is a vibrant hotspot for creativity in eastern Germany, known for its world-class research in biodiversity and ecosystem sciences. Situated in a diverse region, Leipzig is a modern, growing and vibrant city with a high quality of life and a wide cultural offering for a balance between family and professional life.

Please send your application with the subject line “[RSC4Earth PhDProject *n*]”, where *n* is the number of the project - (multiple numbers possible) including 1) letter of motivation, 2) CV, 3) list of publications (if applicable), and 4) names of up to two relevant academic references as a single pdf, and 5) please fill out the following table (<https://speicherwolke.uni-leipzig.de/index.php/s/7to8YQGjpbzmmYL/download>) and sent it back with your application. to angelika.brachmann@uni-leipzig.de. Please note that applications sent to any other email address will not be accepted.

Please note that it is not possible to guarantee confidentiality and rule out unauthorised access by third parties when communicating via unencrypted email.

Disabled people are encouraged to apply and will be given preference in the case of equal suitability.

Privacy information

The personal data contained within your application documents or obtained during the interview will be processed exclusively for the purposes of the selection process for the position advertised. The legal basis for such data processing is Section 11(1) of the Saxon Data Protection Implementation Act (Sächs DSDG) in conjunction with the EU General Data Protection Regulation (GDPR). The controller for the application process within the meaning of the GDPR is the addressee of the application, as specified in the respective advertisement. When processing your application, your personal data will be passed on within Leipzig University to the members of the selection committee as part of their organisational or statutory responsibilities.

Your personal data will be erased no later than six months after completion of the selection process. In accordance with the GDPR, subject to the relevant statutory requirements you have the following rights vis-a-vis the addressee of the application with regard to your personal data: right of access (Art. 15 GDPR); right to rectification of inaccurate personal data (Art. 16 GDPR); right to erasure (Art. 17 GDPR); right to restriction of processing (Art. 18 GDPR); and right to object to processing (Art. 21 GDPR). If you have any questions, please contact the Data Protection Officer at Leipzig University (office: Augustusplatz 10, 04109 Leipzig). You also have the right to lodge a complaint with the Saxon Commissioner for Data Protection.