



Conducting research for a changing society: This is what drives us at Forschungszentrum Jülich. As a member of the Helmholtz Association, we aim to tackle the grand societal challenges of our time and conduct research into the possibilities of a digitized society, a climate-friendly energy system, and a resource-efficient economy. Work together with around 7,500 employees in one of Europe's biggest research centres and help us to shape change!

In the coming decades, climate change and land use change will have a significant impact on the performance of terrestrial ecosystems in terms of their services (food, feed, fiber, energy) and the challenges facing society. At the Institute of Bio- and Geosciences - Agrosphere (IBG-3), we are developing solutions to secure ecosystem services based on an improved understanding of hydrological and biogeochemical processes in terrestrial systems. The focus is on agricultural and forestry systems, which are coming under increasing pressure as a result of global change. Innovative observation technologies are combined with laboratory experiments and modeling to research and predict terrestrial processes across scales (from the pore scale to the field scale to the continental scale), thereby contributing to the sustainable use of natural resources such as water, soil, and the atmosphere.

We are looking to recruit a

PhD Position - Agroecosystem Digital Twins and Drone-Based Data Assimilation

Your Job:

The PhD position is offered within the Cluster of Excellence PhenoRob – Robotics and Phenotyping for Sustainable Crop Production. We are looking for a highly motivated PhD candidate to join our world-leading research program in robotics, remote sensing, and data-driven approaches for sustainable agriculture. PhenoRob's mission is to transform crop production by optimizing breeding and farm management through innovative sensing technologies, advanced modeling, and intelligent automation.

This PhD project contributes to PhenoRob's initiative to develop digital twins, i.e., high-fidelity virtual representations of agricultural ecosystems. These digital twins will enhance our understanding of ecosystem functioning and carbon fluxes, supporting the design of more sustainable and resilient crop production systems. The project will focus on integrating high-resolution drone-based remote sensing data, including multispectral

The job will be advertised until the position has been successfully filled. You should therefore submit your application as soon as possible. We look forward to receiving your application via our

Online-Recruitment-System!

Questions about the vacancy?

Get in touch with us by using **our contact form**.

Please note that for technical reasons we cannot accept applications via email. www.fz-juelich.de

and thermal imagery as well as LiDAR measurements, into ensemble agroecosystem model simulations. The successful candidate will play a key role in developing robust landscape-scale digital twins and advancing data assimilation techniques for agricultural and environmental applications.

You will be part of a dynamic research team applying advanced remote sensing and simulation methods to study soil-vegetation-atmosphere interactions. Your main responsibilities will include:

- Fly drones and process data of multispectral, thermal and LiDAR sensors
- Implement approaches to integrate drone data into an existing agroecosystem data assimilation framework
- Use radiative transfer models to convert model state variables (e.g., LAI, canopy temperature) into synthetic observations
- Evaluate the performance of the data assimilation framework in controlled experiments and evaluate its potential for spaceborne remote sensing and landscape-scale applications
- Improve simulation accuracy for key ecosystem variables such as gross primary productivity (GPP) and net ecosystem exchange (NEE)
- Work with data from PhenoRob experimental field sites, equipped with Eddy Covariance towers, to generate digital twins and quantify model uncertainties.

For further information visit our website

http://www.fz-juelich.de/ibg/ibg-3/EN/Home/home_node.html or contact us via the contact form.

Your Profile:

- Master's degree in geography, remote sensing, geoscience, physics, computational geoscience, or related natural sciences with an overall grade of at least good
- Experience in programming (e.g., Python, C/C++)
- Advanced knowledge of numerical methods
- Experience with flying drones and drone data processing (thermal IR, multispectral, LiDAR), fieldwork experience
- Strong English communication skills
- Since the work involves interdisciplinary cooperation with several researchers and technicians, good communication and organizational skills are essential
- Drivers license and EU drone license is required (or should be obtained within first 3 months)
- Physical work is required for manual soil and plant measurements in and transport of equipment to the field

Our Offer:

We work on the very latest issues that impact our society and are offering you the chance to actively help in shaping the change! We offer ideal conditions for you to complete your doctoral degree:

- Working in an interdisciplinary environment as well as excellent facilities for remote sensing research and numerical simulation and inversion
- Opportunities to being part of the national and international scientific community
- PhD students are encouraged to attend international conferences and a three months research stay abroad with a cooperating partner is possible
- Working in the heart of Europe
- Dynamic and diverse working group and work environment
- Your professional development is important to us – we support you specifically and individually e.g., through training and networking opportunities specifically for

doctoral candidates (JuDocS): <https://go.fzj.de/JuDocs>

- 30 days of annual leave
- Further development of your personal strengths, e.g. through an extensive range of training courses; a structured program of continuing education and networking opportunities specifically for doctoral researchers via JuDocS, the Jülich Center for Doctoral Researchers and Supervisors: <https://www.fz-juelich.de/en/judocs>
- Targeted services for international employees, e.g. through our International Advisory Service

The position is for a fixed term of 4 years. Pay is in line with 70% of pay group 13 of the Collective Agreement for the Public Service (TVöD-Bund) and additionally 60 % of a monthly salary as special payment („Christmas bonus“). The monthly salaries in euro can be found on the BMI website: <https://go.fzj.de/bmi.tvued.entgelt> Further information on doctoral degrees at Forschungszentrum Jülich (including its various branch offices) is available at <https://www.fz-juelich.de/en/careers/phd>

We welcome applications from people with diverse backgrounds, e.g. in terms of age, gender, disability, sexual orientation / identity, and social, ethnic and religious origin. A diverse and inclusive working environment with equal opportunities in which everyone can realize their potential is important to us.

Further information on diversity and equal opportunities: <https://go.fzj.de/equality>