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 7,250 employees in one of Europe’s biggest research centres and help us to shape change!

We are looking to recruit a

**PhD Position - Hybrid Soil Microbiome Modeling**

**Your Job:**
You will combine process-based and machine-learning models to establish a hybrid modeling approach for the soil microbiome within a young, dynamic and interdisciplinary team in an international working environment. Your work will be connected with the "Digital Agricultural Avatar" developed in the DFG-funded Cluster of Excellence PhenoRob (www.phenorob.de).

**Your tasks:**
- Applying and extending process-based models to simulate the soil microbiome and reactive solute transport in soil and rhizosphere
- Model conditioning and sensitivity analysis using Bayesian frameworks
- Applying machine learning to train surrogate models of process-based models
- Implementing systematic workflows for model conditioning and machine learning in close cooperation with software developers
- Support in mentoring students (M.Sc., B.Sc.)
- Writing scientific publications
- Presenting your research results in conferences in Germany and abroad

Climate and land use change have significant impacts on terrestrial ecosystems. Effective management and adaptation strategies to global change require reliable forecasts of matter and energy flows. The Institute of Bio- and Geosciences - Agrosphere (IBG-3) addresses this challenge by enhancing the limited understanding of complex system responses to environmental stress to improve the prediction of hydrological and bio-geochemical processes in terrestrial systems. Your work will foster the integration of process-based models and machine learning to achieve model-based predictions in soil systems close to real-time.

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
Your Profile:

- Scientific university degree (Master) in natural sciences, environmental science, agricultural science, geo science, data science, or related fields
- Solid understanding of matter cycling, biogeochemical processes in ecosystems and agricultural systems
- Experience in applying process-based models and scientific programming
- Good knowledge of differential calculus
- Secure command of written and spoken English
- Structured, team-oriented and proactive working style

You achieved or you have a strong drive to gain:

- Experience in developing process-based models based on ordinary and partial differential equations
- Theoretical foundations of Bayesian statistics
- Experience with model analysis techniques and Bayesian interference for parameter estimation
- Competencies in bioinformatic analysis methods
- Good knowledge or experience in machine learning

Please feel free to apply for the position even if you do not have all the required skills and knowledge. We may be able to teach you missing skills during your induction.

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:

- A large research campus with green spaces, offering the best possible means for networking with colleagues and pursuing sports alongside work
- Outstanding scientific and technical infrastructure
- Continuous scientific mentoring by your scientific supervisor
- Comprehensive training courses and individual opportunities for personal and professional further development: [https://go.fzj.de/JuDocs](https://go.fzj.de/JuDocs)
- Extensive company health management
- Ideal conditions for balancing work and private life, as well as a family-friendly corporate policy
- Flexible work (location) arrangements, e.g. remote work to a degree
- 30 days of annual leave and an attractive regulation for bridging days

We offer you an exciting and varied role in an international and interdisciplinary working environment. The position is initially limited to 3 years with the possibility of an extension to 4 years. Pay 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“). Further information on doctoral degrees at Forschungszentrum Jülich including our other locations is available at: [https://www.fz-juelich.de/gp/Careers_Docs](https://www.fz-juelich.de/gp/Careers_Docs)

In addition to exciting tasks and a sense of community, we offer you much more: [https://go.fzj.de/Benefits](https://go.fzj.de/Benefits)

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.