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!

Are you excited about working at the interface of natural and computer sciences?
At the Institute of Bio- and Geosciences (IBG) at Forschungszentrum Jülich, we explore how biological systems function and how they can be harnessed for a sustainable bioeconomy. Our research spans plant and agrosphere sciences, microbiology, biotechnology, and data science, always with the goal of contributing to solutions for global challenges such as climate change, resource scarcity, and the transition to circular economies.
As part of this mission, we are offering four PhD positions in the Simulation and Data Lab Digital Bioeconomy (SDL-DBE). The SDL-DBE develops and applies multiscale models, AI-enhanced simulations, and computational workflows across IBG-relevant domains including plant biology, microbial systems, and circular bioprocesses.
Join us and contribute your ideas to shape sustainable innovations and the digital transformation of the bioeconomy.

We are offering

Several PhD positions - Simulation and Data Lab Digital Bioeconomy (four positions)

Your Job:
You will work as a doctoral researcher within one of four interdisciplinary PhD projects in the Simulation and Data Lab Digital Bioeconomy. Each project combines natural sciences with computational and data-driven approaches, focusing on topics such as plant carbon transport, microbial systems, or circular bioprocesses. You will contribute to developing and applying novel modeling strategies, AI-enhanced simulations, and computational workflows to explore biological complexity and design solutions for a sustainable bioeconomy.

The four PhD projects are:

- 1. MISOWASP: Linking Molecular scale Interactions of Soil Organic matter with

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

Water retention in Soil-Plant systems (Link: https://www.fz-juelich.de/de/ibg/daten-ki/casa-sdl-dbe/misowasp-1)
- 2. PINM: Process-based integrated modeling of rhizosphere N cycling for improved plant N uptake (Link: https://www.fz-juelich.de/de/ibg/daten-ki/casa-sdl-dbe/pinm)
- 3. ProSeC: Bacterial protein secretion: from modeling and data analysis to application (Link: https://www.fz-juelich.de/de/ibg/daten-ki/casa-sdl-dbe/prosec)
- 4. VICAR: In vivo quantification of carbon allocation in plant root networks (Link: https://www.fz-juelich.de/de/ibg/daten-ki/casa-sdl-dbe/vicar)

Further details on each project can be found on our website:
www.fz-juelich.de/ibg/daten-ki/casa-sdl-dbe

Your Profile:
- Master's degree (or equivalent) in computer science, applied mathematics, physics, engineering, biology, plant and agrosphere sciences, or another relevant natural science;
- Strong interest in interdisciplinary research at the interface of natural sciences, data science, and computational modeling.
- Experience in at least one of the following areas: scientific programming and data analysis (e.g., Python, R, C++, MATLAB), computational modeling, imaging and sensor data processing, bioinformatics, systems biology, or biophysics.
- Familiarity with simulation environments, numerical methods, or machine learning approaches is an advantage.
- Fluent command of written and spoken English is necessary; German is an advantage but not required.
- High degree of independence, motivation, and reliability, combined with a collaborative mindset and the ability to work in interdisciplinary teams.

With your application please upload the following documents (in pdf format):
- Curriculum Vitae: with relevant credentials, qualifications (incl. your experience with scientific software, programming, and software development), contact information of your Master`s Thesis Advisor
- Motivation letter incl. a) clearly stating which position your are interested in (max. 3) and why, b) your current research interest (this gives some insight in your vision on future research) and c) your research experience (mostly what your Master thesis was about), so we understand your motivation of doing a PhD with us (max. 600 words)
- Certificates & Transcripts of grades of Your Master`s and Bachelor`s Degrees: we accept degrees in German or English or certified and notarized translations of your degree; if you cannot upload a Certificate of your Master`s degree yet, please upload a document with the envisioned date of graduation, the thesis title, and a short outline
- Reference letter (if available)
- Further certificates of relevant qualifications, if available

Our Offer:
We offer you the opportunity to pursue your doctoral degree on exciting research topics at the intersection of digital technologies, simulation, and bioeconomy. In this interdisciplinary environment, you will work on projects that contribute directly to sustainable agriculture, resource efficiency, and climate resilience.
We offer ideal conditions for you to complete your doctoral degree:
- Team & Environment: You will work in a motivated team with an international and interdisciplinary focus – at one of the largest research institutions in Europe

- Research & Infrastructure: You will have access to excellent scientific and technical facilities for your work, ranging from high-performance computing and advanced imaging platforms to specialized experimental facilities.
- Networking & Exchange: You will participate in (international) conferences and project meetings and actively build your scientific network
- Work-life balance: 30 days of annual leave, flexible working arrangements (including remote working) are generally possible upon agreement and in line with upcoming tasks and (on-site) appointments
- Knowledge & Development: Your professional growth is important to us – we support you specifically and individually, for example through training opportunities and the structured JuDocS program for doctoral candidates https://www.fz-juelich.de/en/judocs
- Health & well-being: Your health is important to us. You can look forward to a comprehensive company health management programme with a wide range of options, including a beach volleyball court, running groups, yoga classes and much more. In addition, our company medical service and an experienced social counselling team are available to assist you on site
- Support for international employees: Our International Advisory Service makes it easier for international employees to get started
- Fair remuneration: Depending on your qualifications and assigned responsibilities, you will be classified according to 75% 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.tvoed.entgelt). The positions are for a fixed term of 3 or 4 years (please check the details in the project link).

Further information on the project is available at:
https://www.fz-juelich.de/de/ibg/daten-ki/casa-sdl-dbe

In addition to exciting tasks and a collegial working environment, we offer you much more: https://go.fzj.de/benefits

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 and on specific support options: https://go.fzj.de/womens-job-journey