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 eager to pursue a four-year doctoral project that bridges scientific disciplines? Are you excited by complex societal challenges that demand interdisciplinary solutions? Then the Program for Collaborative Doctoral Projects is the perfect opportunity for you. Many of today's most pressing problems can only be tackled through interdisciplinary collaboration. That's why our projects are designed specifically to connect diverse scientific fields and foster cross-institutional collaboration, enabling you to benefit from the combined expertise and supervision of experienced researchers from multiple institutes at Forschungszentrum Jülich. As one of Europe's largest and most multidisciplinary research centres, Forschungszentrum Jülich offers access to state-of-the-art infrastructure and a vibrant scientific community. Join us in developing solutions for a rapidly changing world and help shape the future by working in an international environment. For more information about the Program for Collaborative Doctoral Projects please visit: https://go.fzj.de/Collaborative-Doctoral-Projects

We are offering an interesting

Collaborative Doctoral Project (PhD Position) - Accelerated materials development by combining high-throughput and AI approaches

Your Job:

The accelerated development of advanced materials is essential for addressing major challenges in energy, mobility, and sustainability. Traditional trial-and-error methods in materials design are often too slow, costly, and inefficient to cope with the increasing complexity of performance and resource-efficiency requirements. This collaborative doctoral project brings together the Institute of Advanced Simulation – Materials Data Science and Informatics (IAS-9) and the Institute of Energy Materials and Devices – Structure and Function of Materials (IMD-1) to establish a data-driven, experimentally

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

grounded workflow for rapid microstructure-property optimization in steels. The PhD student will play a central role in this interdisciplinary initiative. They will:

- Develop and apply machine learning (ML) methods—including surrogate modelling, feature extraction, and inverse design algorithms
- Generate synthetic microstructures (based on the open-source OptiMic software)
- Perform descriptor extraction and micromechanical simulations (MCRpy, DAMASK)
- Vary the material processing parameters, which results in materials with diverse microstructures and mechanical properties
- Perform experimental characterizations of additive-manufactured and heat-treated steels, using state-of-the-art methods such as scanning electron microscopy (SEM), electron backscatter diffraction (EBSD), X-ray diffraction (XRD), and nanoindentation, for generating their own data sets

Your Profile:

- A completed university degree (Master or equivalent) with excellent grades in the field of data science, material science, mechanical engineering, physics, or similar, with a strong Machine Learning or simulation background
- In depth practical experience in at least one programming language (preferably Python)
- Ideally, some practical experience in material characterization methods
- Structured and analytical thinking as well as a systematic, careful, independent, and reliable working method
- Strong cooperation and communication skills and the ability to work as part of a team
- Excellent written and spoken English skills

Please note that only applications including a motivation letter, CV, and university degree certificates and grade transcripts can be accepted.

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 creative work environment at a leading research facility, located on an attractive research campus at the TZA Aachen https://tza-aachen.de and the Forschungszentrum Jülich
- The opportunity to gain your reputation in a dynamic and highly active research field
- 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
- Flexible working hours and various opportunities to reconcile work and private life-life, such as the option of slightly reduced working hours and 30 days of annual leave
- Targeted services for international employees, e.g. through our International Advisory Service
- Opportunity to participate in (international) conferences and project meetings
- Continuous professional support from your scientific supervisors

In addition to exciting tasks and a collaborative working atmosphere at Jülich, we have a lot more to offer: https://go.fzj.de/benefits

We offer a 4-year PhD position. Salary and social benefits in conformity with the provisions of the Collective Agreement for the Civil Service (TVöD). Depending on your qualifications and the precise nature of the tasks, salary grade 13 TVöD-Bund (up to 100%) 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

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