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!

The properties of implants, based on biomedical magnesium alloys, crucially depend on the composition of the secondary phases in the microstructure in terms of their formation, spatial distribution and stability against degradation. In a joint project between the Institute of Metallic Biomaterials at Helmholtz-Zentrum Hereon and the ER-C at Forschungszentrum Jülich, we are looking for a doctoral researcher to characterize biodegradable Mg alloys containing a Long Periodic Stacking Ordered (LPSO) phase, developed for medical implant applications. A multimodal imaging approach that covers length scales ranging from atomic arrangements to the sizes of stable precipitates is required to unravel the formation and stability of the LPSO phases depending on alloying additions. Using X-ray nanotomographic imaging, transmission electron microscopy and atom probe tomography, this project will investigate the material microstructure and the effect of LPSO phases on the degradation mechanisms of the implant. Deep learning will be used to merge information from images at different scales.

Join our team to the next possible date as

PhD Position - Multimodal Nanoscale Characterization of Biodegradable Magnesium-LPSO Alloys

Your Job:
In a joint project between the Institute of Metallic Biomaterials at Helmholtz-Zentrum Hereon in Hamburg and the ER-C at Forschungszentrum Jülich, we are looking for a doctoral researcher to characterize biodegradable Mg alloys containing a Long Periodic Stacking Ordered (LPSO) phase, developed for medical implant applications.

You will be responsible for establishing a correlative workflow for the imaging of Mg-LPSO alloys via X-ray nanotomography followed by higher resolution imaging of the identified regions of interest using transmission electron microscopy and atom probe tomography. To this end, you will utilize pattern matching to identify characteristic

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

sample features both in X-ray tomographic images and the focussed-ion beam workstation in which the samples for electron microscopy and atom probe tomography will be prepared. Finally, you will merge the images by means of deep learning algorithms.

Your tasks in detail

- Development of the experimental protocol for the imaging of Mg-LPSO alloys that have undergone degradation in a physiological environment using X-ray nanotomography with the highest achievable resolution
- Localization and focused ion beam preparation of the regions of interest determined in X-ray imaging for later analysis using high-resolution transmission electron microscopy and atom probe tomography
- Performing transmission electron microscopy experiments
- Performing atom probe tomography
- Application of deep learning algorithms for the correlation of the obtained experimental data and their analysis
- The majority of the work will be undertaken in Hamburg

Your Profile:

- University degree (M.Sc., diploma or equivalent) in materials science, engineering sciences, or physics
- Experience in at least one of the methods of X-ray imaging, transmission electron microscopy and/or atom probe tomography
- Experience in image processing
- Experience in programming with Python or Matlab is strongly desired
- Team spirit as well as excellent communication and organizational skills
- Excellent written and spoken English skills
- Willingness to travel between the research centres

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:

- An interesting and socially relevant topic for your thesis with a future-oriented subject
- Ideal conditions for practical experience alongside your studies
- Interdisciplinary collaboration on projects in an international, committed and collegial team
- Excellent scientific equipment and the latest technology
- Qualified supervision by scientific colleagues
- Independent preparation and implementation of the assigned tasks
- A large research campus in the countryside, which offers the best opportunities for networking with colleagues and for sporting activities alongside work
- The opportunity to work flexibly (in terms of location), e.g. partly from home
- 30 days of annual leave and provision for days off between public holidays and weekends (e.g. between Christmas and New Year)
- Opportunity to develop your strengths, e.g. through a comprehensive training programme; a structured programme including continuing professional development and networking opportunities specifically designed for Jülich's doctoral researchers by the Jülich Center for Doctoral Researchers and Supervisors (JuDocS): https://go.fzj.de/JuDocs
- Targeted services for international employees, e.g. through our International Advisory Service

In addition to exciting tasks and the collaborative working atmosphere at Jülich, we have a lot more to offer: https://www.fz-juelich.de/en/careers/julich-as-an-employer/benefits

The position is initially limited to three years, starting as soon as possible. Pay is in line with 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 euros can be found on page 66 of the PDF download: https://go.fzj.de/bmi.tvoed Further information on doctoral degrees at Forschungszentrum Jülich including our other locations is available at: https://www.fz-juelich.de/gp/Careers_Docs

Place of Employment: Helmholtz-Zentrum Hereon at the DESY campus in Hamburg, and Forschungszentrum Jülich.

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