JÜLICH
Forschungszentrum

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 Jülich Supercomputing Centre (JSC) operates one of the most powerful supercomputer infrastructures in Europe and hosts the first EU Exascale supercomputer JUPITER. Computing resources are provided to scientists in Germany and in Europe. To support users of the systems, JSC uses its expertise in high-performance computing (HPC), artificial intelligence (AI), and data science in general. JSC's simulation and data laboratory (SDL) "Fluids & Solids Engineering" develops scalable simulation codes for engineering applications, AI models for compute acceleration and the prediction of physical properties, and tools for AI and HPC workflow automatization. The SDL "Applied Machine Learning" applies recent progress in the field of machine learning (ML) and AI to topics relevant in science and industry. Both SDLs participate in the Excellence Cluster "Dynaverse", which investigates how physical processes across vastly different time scales shape the dynamic evolution of the Universe, combining astrophysics, computer science, mathematics, and advanced data-analysis methods.

Join our team to the next possible date as

Simulation, AI, and HPC Workflow Specialist

Your Job:
In this position, you will be an active member of the SDL "Fluids & Solids Engineering" and will collaborate strongly with the SDL "Applied Machine Learning". You will have the following tasks:

- You will work together with renowned astrophysicists and computer scientists in the DFG-funded "Dynaverse" Excellence Cluster
- You will invent, implement, and benchmark novel AI tools (reinforcement learning, physics-informed neural networks, graph neural networks, transformers, convolutional defiltering methods, etc.) for the integration in multi-physics simulation codes
- You will develop code for and run large-scale multi-physics simulations in the context of astrophysical applications, specifically focussing on Chimera/overset

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

mesh implementations, and will contribute to the developments of chemistry emulators for shocks
- You will evaluate and document results in the form of open-source software, open-access publications, and project reports
- You will lead and contribute to the developments of the Shared Universe Engine (SUE), a physics-guided, intelligent, cloud-based open-source platform that combines a data laboratory, analysis tools, and interfaces to heterogeneous astrophysical data and simulations to serve as a collaborative workspace and “machinery of discovery” for researchers, educators, and the public
- In all of these activities, you will make use of JSC’s cutting-edge HPC- and Quantum-hardware

Your Profile:
- Master and subsequent PhD degree in (astro-)physics, computer science, engineering, or other related fields, with a strong focus on numerical simulations
- Experience in the development of numerical methods for multi-physics application, specifically using Chimera/overset meshes and with applications to shocks
- Experience in programming in Python and C++, and in using scripting languages commonly used on Unix systems. Additional languages or experience with libraries for utilizing GPU hardware efficiently, e.g., CUDA, are a plus.
- Experience in AI programming with, e.g., PyTorch(-DDP), Horovod, or DeepSpeed, and in hyperparameter optimization (HPO), as well as in designing and implementing AI+HPC+simulation workflows (experience with workflow managers for scientific applications is a plus)
- Experience in running large-scale simulations on HPC systems with heterogeneous hardware, using CPUs/GPUs, and in analyzing complex, multi-modal data
- A generalist with an interest to solve challenges using a large set of diverse software tools and applications
- Excellent written and spoken English
- Ability and willingness to work in an interdisciplinary and distributed team.

Note that it is not necessary to fulfil all of these requirements in order to be considered for the position. We want you to fit in with us as a person, not just your profile.

Our Offer:
We work on highly topical, socially relevant issues and offer you the opportunity to actively shape change! You can expect a wide range of opportunities:
- MEANINGFUL TASKS: A diverse range of activities in an engaged and experienced team
- KNOWLEDGE & FURTHER TRAINING: Your professional development is important to us – we provide targeted, individual support
- SUCCESSFUL START: It is important to us that you quickly settle into the team and are given structured training for your tasks. We also support you from the very beginning and make your start easier with our Welcome Days and Welcome Guide: https://go.fzj.de/welcome
- FLEXIBILITY: Flexible working time models, including options close to full-time (https://go.fzj.de/near-full-time), allow you to tailor your working hours to suit your individual needs
- FAIR REMUNERATION: Depending on your existing qualifications and the tasks assigned to you, you will be classified in pay grade 13 - 14 of the TVöD-Bund (Collective Agreement for the Public Service). All information on the TVöD-Bund collective agreement can be found on the BMI website: https://go.fzj.de/bmi.tvoed . The monthly salaries in euros can be found on page 69 of the PDF download
- FIXED-TERM: The position is initially limited to 2 years

- VACATION: You will receive 30 days of vacation (depending on the chosen working time model) plus additional days off (e.g. between Christmas and New Year`s)

In addition to exciting tasks and a collegial working environment, we offer you much more: 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.

The following links provide further information on diversity and equal opportunities: https://go.fzj.de/equality and on specific support options for women: https://go.fzj.de/womens-job-journey