JÜLICH
Forschungszentrum

Artistic visualization of a stacked chip, partly supported by the use of AI (Lexica). © cfaed

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!

Phase change memories (PCM) are an interesting candidate for future non-volatile memory and neuromorphic computing technologies. For the latter application, the resistance should be changed gradually at fast speed. At the Peter Grünberg Institute - Elektronische Materialien (PGI-7), we recently showed that PCM materials can be switched electrically in the sub-nanosecond regime with a record of 50 ps. In this regime, gradual RESET switching becomes feasible, which is not well understood yet.

We are looking to recruit a

Master Thesis - Modeling sub-ns Switching of Bridge-Type Phase Change Memories

Your Job:
In this Master's thesis, you will model bridge-type PCM devices in the sub-nanosecond regime. The aim is to explain experimentally observed dynamical behavior based on continuum simulation models. The work will be carried out in close collaboration with experienced researchers at PGI-7. Your tasks include:

- Applying a continuum simulation framework to model PCM devices
- Investigating the effect of different material properties on the switching dynamics
- Analyzing and interpreting the simulation results to explain the switching dynamics
- Identifying potential optimization strategies for different application use cases

Your Profile:

- Enrolled in a Master's program in physics, materials science, electrical engineering or a related discipline
- Solid background in solid-state physics and/or semiconductor devices is helpful
- Basic programming skills (e.g. Python or MATLAB); prior simulation experience is an advantage
- Interest in nanoscale transport phenomena and physical modeling
- Independent, structured, and motivated working style

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

- Good command of English (written and spoken)

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 support you in your work with:
- A research topic with strong relevance for future memory technologies
- Work with a well-established FEM simulation tool
- Close supervision and integration into a highly motivated, interdisciplinary team
- Opportunity to contribute to ongoing industry-related research
- Flexible working conditions (start date, working hours, home office options)

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

The position is initially for a fixed term of up to 12 months.

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