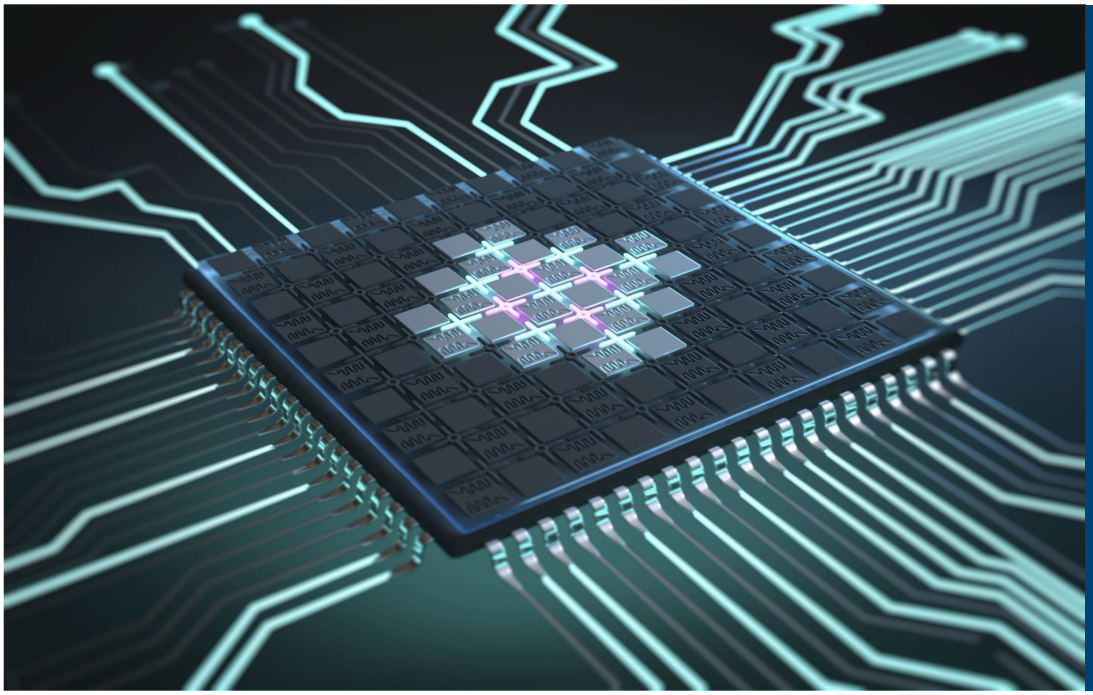
JÜLICH
Forschungszentrum



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!

Resistive switching memory devices based on metal oxides (ReRAM) are a promising candidate for future non-volatile memory and neuromorphic computing technologies and recently entered the market as eNVM. However, these devices often exhibit a metastable resistance state shortly after programming, which can evolve over time before stabilizing. At our Peter Grünberg Institute - Electronic Materials (PGI-7), we work on understanding the physical origin of this metastability is key to improving device reliability and performance.

We offer you to the next possible date an exiting

Master Thesis - Metastability of Resistive Switching States in Oxide-Based ReRAM Using a 3D Kinetic Monte Carlo Model

Your Job:
In this Master's thesis, you will investigate the impact of different programming algorithms on the stability of resistance states using a sophisticated 3D Kinetic Monte Carlo (KMC) model. The aim is to explain experimentally observed metastable behavior and to identify strategies to minimize or control such effects. The simulations are performed on the JURECA high-performance computing cluster, and the work will be carried out in close collaboration with experienced researchers at PGI-7. Your tasks include:

- Applying a 3D KMC simulation framework to model resistive switching in metal oxide ReRAM
- Investigating the effect of different programming schemes on state stability
- Analyzing and interpreting the simulation results to explain metastable behavior
- Identifying potential optimization strategies for improved device performance

For more information on this interesting topic, please have a look at https://www.neurotec.org/de

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

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

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:

- An interesting and socially relevant topic for your thesis with future-oriented themes
- Ideal conditions for gaining practical experience alongside your studies
- An interdisciplinary collaboration on projects in an international, committed and collegial 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