

Junior Scientist (Phd candidate) position at NaMLab: “Co-design of Area-Dependent VCM Cell Arrays and CMOS circuits for In-Memory Computing”



We are currently looking for a young scientist to work in the field of **circuit design utilizing emerging non-volatile devices** in the framework of **TRR404 on 3D-microelectronic technology**. Analogue switching devices based on valence change mechanism – also called valence change memory (VCM), promise low-energy solutions in beyond-von Neumann computing architectures and neuromorphic accelerators. These require novel circuitry adapted to the specific benefits and challenges of VCM devices (e.g. low readout currents, multilevel device operation, variabilities stemming from the device integration). In this project you will characterize and model VCM devices, and design novel VCM-based bit-cells, computing primitives as well as drivers or read-out circuitry in an analogue / digital mixed-signal approach. You will work closely with materials engineers to match device behaviour to appropriate cell design and vice versa. The results of the scientific work can be used to obtain a PhD in Electrical Engineering at the TU Dresden.

What we expect from you:

- above-average degree achieved in short study period,
- willingness and ability to think beyond the boundaries of your field, to act in an international and diverse environment and to live an open and constructive communication,
- strong analytic and problem-solving skills, creativity,
- an independent, target- and solution-driven work attitude,
- fluency in English, knowledge of German would be a plus

What you can expect from us: A varied and challenging research task, embedded in a friendly, inclusive and supportive team of the TRR’s Principal Investigators (i.e., project leaders and supervisors). We maintain an open and cooperative work attitude with maximum personal responsibility, mutual support with a solution-oriented approach, and flexible working hours where possible. As a doctoral student you will be integrated in the TRR’s Graduate School. It will offer tailored educational programs and individual supervision agreements.

About the TRR404: The TRR404 is a Collaborative Research Center/Transregio between TUD Dresden University of Technology and Rheinisch-Westfälische Technische Hochschule Aachen (RWTH Aachen). It aims at exploring a **completely new approach for microelectronics technology** and therefore teams up materialists, electrical engineers, and computer scientists of TUD, RWTH Aachen and Gesellschaft für Angewandte Mikro- und Optoelektronik mbH ([AMO](#)) in Aachen, Forschungszentrum Jülich ([FZJ](#)), Max Planck Institute of Microstructure Physics Halle ([MPI-MSP](#)), Nanoelectronic Materials Laboratory gGmbH ([NaMLab](#)) in Dresden, and Ruhr-Universität Bochum ([RUB](#)).

For the initial funding phase (April 2025 – December 2028), the TRR404 offers several PhD and Postdoc positions with starting dates from 1 April 2025 onwards. All vacancies can be found here: <https://cfaed.tu-dresden.de/trr-vacancies>.

The TRR404 strives to attract more women to microelectronics research. We therefore expressly encourage women to apply. We welcome applications from candidates with disabilities. By sending us your application documents, you agree to the use of your personal data for the purpose of the application procedure.

For further information please contact:
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