IHP GmbH -
Innovations for High Performance Microelectronics/
Leibniz-Institut für innovative Mikroelektronik



Postdoctoral position (m/w/d) for Modeling and Simulation of RRAM devices

Job-ID: 0076/23 | Department: Materials Research | Salary: as per tariff (TV-L) | Working Time: 40h/week (part-time work option) | Limitation: initially 2 years with option of extension for three more years | Starting Date: 31.10.2023

IHP is an institute of the Leibniz Association and conducts research and development of silicon-based systems and ultra high-frequency circuits and technologies including new materials. It develops innovative solutions for application areas such as wireless and broadband communication, security, medical technology, industry 4.0, automotive industry, and aerospace. IHP employs approximately 380 people. It operates a pilot line for technological developments and the preparation of high-speed circuits with 0.13/0.25 µm-SiGe-BiCMOS technologies, located in a 1500 m² cleanroom that meets the highest industrial nanotechnology requirements.

The position:
As a Postdoctoral member of the research team “Adaptive Materials” within the department “Materials Research” you will contribute to the field of RRAM devices. Your tasks will include the development of RRAM models at different levels of abstraction: from complex but accurate atomistic models to simple but time-effective compact/behavioral models. The former focused in understanding the non-idealities of the devices with the aim of optimize them at the fabrication stage. The later to let the designers to simulate their circuits including the MEMRES module available in the IHP’s process design kit. In addition, you will be involved in some electrical characterization tasks to fit the models developed and perform the corresponding simulations. An international team of 10 scientists including very experienced scientists as well as several PhD students is looking forward to you. Flat hierarchies and mutual support are important to us. We see diversity of perspectives as a great advantage for our team.

Your project:
The project at IHP is intended to research into RRAM devices used to implement electronic synapses in hardware-based artificial neural networks. Both switching approaches, namely, filamentary and interfacial will be considered in order to achieve the analog conductance update that can mimic the biological synaptic plasticity. The simulations performed at the atomic scale will provide insights in how to modify the RRAM structure to achieve the desired analog switching feature. Once the objective is fulfilled, the compact modeling will help in the task of designing RRAM-based neuromorphic circuits. A strong interaction with the project manager, laboratory responsible and the entire RRAM team at IHP is expected. Moreover, an intense collaboration with several national and international collaborators is planned.

Your qualifications:

You hold a PhD in Physics, Material Science, Electronics or a comparable study area. You have a strong knowledge in Semiconductor Physics, Modeling & Simulation and RRAM technology. You are familiar with basic ideas of electrical characterization, ideally with the semiconductor characterization system Keithley 4200-SCS or similar. We are looking for a team member who is able to structure his or her own work and to bring a well-organized and systematic way of working into the cooperation with creative minds. In this position, you need to be a strong team player. You are an ideal match for this position, when you have experimental, analytical and problem-solving skills, very strong communicative skills and the ability to quickly learn how to operate the latest technical equipment including various software. It is necessary that you confidently handle the English language. Knowledge of the German language is welcome. The deepening of German language skills is expected and highly encouraged, for example in in-house language courses and intensive courses.

Our Offer:
Conduct research in a challenging, multinational environment giving you excellent career opportunities. You will have the chance to establish international reputation at the edge of top-notch technologies. An orientation guide will help you to quickly integrate into the institute and to familiarize yourself with the field.

It is important to us to support the individual career developments (e.g. conferences, advanced trainings) as well as the personal needs of our employees by offering flexible working hours and the possibility to work off-site. The compatibility of work and family is highly valued. More information about our scientific excellence and the working environment at IHP can be found on our website.

IHP is TOTAL E-QUALITY-certified for equal opportunities for women and men at work and actively pursues the equality of all gender and all groups of people. We promote the professional development of women and strongly encourage them to apply. Disabled applicants, qualified according to the above criteria, will be given preference over other candidates with equivalent relevant qualifications.

Further advantages:
30 days holiday | special annual payment | Company pension scheme (VBL) | Flexible working hours, also part-time (no core working hours) | Possibility to work up to 40 % independent of location according to company agreement | Parent-child room as a possibility to work with a child in case of childcare bottlenecks | A wide range of further training opportunities in-house or within the framework of business trips | Discounted company ticket with monthly allowance of € 15 for various fare zones | Good transport connections, free parking at the institute | Canteen with breakfast and lunch | On-site health services | Company family and care guides | Free, confidential counselling by an external service provider in a wide variety of challenging private or professional situations, for example on how to reconcile work and family life or in psychosocial emergencies | Structured induction and actively supported integration into the institute (welcome workshop, intercultural workshop, joint leisure activities)

Your application:

Have we sparked your interest? Then we look forward to receiving your application via our **online application form.**

For further information regarding the position please contact Dr. O. Skibitzki: career@ihp-microelectronics.com.