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

Master thesis (m/f/d) “Characterization of 1T1R RRAM Devices for Modeling”

Job-ID: 0033/23 | Department: Materials Research | Limitation: 6 months with option of extension | Earliest Entry Date: May 1st, 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 350 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.

Master thesis project:

In the last 10 years, IHP has developed an intensive activity in bringing Resistive Random Access Memory (RRAM) technology based on the TiN/Ti/HfO_2/TiN stack to a maturity level that leads to its integration into 130 nm CMOS process within a 1-transistor-1-resistor (1T1R) architecture. This is the context of your Master's thesis topic. In our Electrical Characterization lab at IHP, you will use a PA200 semi-automatic probe station and the semiconductor analyzer Keythley 4200-SCS in order to test and characterize 1T1R RRAM cells integrated on 200 mm multi-project wafers. With your work, you help our scientists to develop models with the aim of understanding better the mechanisms underlying its switching operation and providing development tools to designers involved in the implementation of circuits that make use of RRAM devices, such as non-volatile memories or neuromorphic computing systems. The latter is particularly appreciated at IHP to be integrated in its process design kit (PDK).

Your team:

You are a member of the research group “Adaptive Materials”, whose focus is the development of functional materials for microelectronics. A motivated and committed team, consisting of both experienced and younger scientists, is looking forward to welcoming you. Scientist with experience in electrical characterization tools will support your work. Flat hierarchies and mutual support are important to us. We see diversity of perspectives as an opportunity for the team and we strive for a balanced gender representation.

Your qualifications:

You hold Bachelor's degree in physics, materials science, nanoengineering, electronics or related. You have good understanding of electronics and some experience in electrical laboratories. Desirable but not mandatory hands-on experience with Keithley 4200-SCS, Matlab and Origin. English and/or German language skills are welcome. The consolidating of German or English language skills is expected and highly encouraged, for example in in-house language courses and intensive courses.

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Our Offer:

Gain insights into a dynamic and multinational research institute for microelectronics! You will apply your theoretical knowledge from university in practice and contribute to our research projects with your work! A motivated, international team, consisting of very experienced scientists as well as young colleagues is looking forward to you. Take the opportunity to lay the foundations for your career in a research institute that operates close to the economy. Your experience will be of great benefit to you, regardless of whether you want to start your career in academia or in business. We guarantee flexible working hours.
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.

Your application:

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

For further information about the position, please contact Dr. Eduardo Perez: career@ihp-microelectronics.com.