

Faculty of Electrical and Computer Engineering

At the **Institute of Circuits and Systems** the **Chair for Electron Device and Integrated Circuits** (CEDIC) has an opening for a

Research Associate

(Subject to personal qualification employees are remunerated according to salary group E 13 TV-L)

starting as soon as possible. The position is a fixed term of 36 months appointment with the option of an extension upon positive evaluation of further third party projects. The period of employment is governed by the Fixed Term Research Contracts Act (Wissenschaftszeitvertragsgesetz - WissZeitVG).

CEDIC has been an internationally recognized research group in the area of device modeling for high-frequency (HF) applications, with significant contributions in particular to the theoretical understanding and exploration of high-frequency performance and physical limits of heterojunction bipolar transistors and carbon nanotube based field-effect transistors (CNTFETs) as well as to the development of related models and tools for circuit design. CEDIC has also been involved in various research projects funded by the German National Science Foundation (DFG), German Federal government, the European Union and DARPA.

Project tasks. The successful candidate is expected to contribute to a DFG funded research project on the electrical characterization and modeling of CNTFETs. Specific tasks comprise: (i) Electrical characterization of breakdown in CNTFETs with different channel formation methods (CVD, dispersion), different gate oxide materials (HfO₂, Al₂O₃), and different substrate materials (SiO₂, quartz). (ii) Development of a theoretical understanding of the breakdown mechanisms relevant for transistor based electronics and, using transistors and other test structures, determination of relevant material parameters for device modeling (TCAD). (iii) Development and design of test structures for compact model parameter extraction. (iv) Numerically efficient and stable extension of our existing compact models by physics-based formulations for the investigated breakdown mechanisms, enabling the investigation of the impact of CNTFET breakdown on the performance of HF circuits. (v) Experimental compact model verification. The work requires a strong cooperation within a team of researchers at CEDIC and at cooperation partners. Participation in research project related progress reports, presentations at project meetings and publications is also expected.

Required qualification: Applicants should hold an outstanding Master/Dipl.-Ing. degree in electrical engineering. Hands-on experience in the following areas is mandatory: DC and S-parameter on-wafer experimental characterization of electronic devices; MOSFET theory and modeling; model implementation in standard commercial circuit simulators (preferably via Verilog-A); compact model parameter extraction. Additional knowledge in CNTFET operation principles and a good knowledge on semiconductor fundamentals will be a prerequisite for a successful application. Excellent English language and communication skills are highly desired.

We particularly encourage qualified women and candidates with disabilities to apply.

Application Procedure: Your application (**in English only**) should include: motivation letter, CV with description of completed projects in the areas described above, transcript of grades (i.e. the official list of coursework including your grades) and proof of English language skills. Complete applications should be submitted only by e-mail (as PDF-document) quoting **Research Associate application** in the subject header to: michael.schroeter@tu-dresden.de. The closing date for applications is 20.02.2022. Please note: We are unable to receive electronically signed and encrypted data.

Reference to data protection: Your data protection rights, the purpose for which your data will be processed, as well as further information about data protection is available to you on the website: <https://tu-dresden.de/karriere/datenschutzhinweis>