

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 ultra-scaled SiGeC HBTs beyond the existing roadmap. Specific tasks comprise: (i) Determination of transport related material properties in extremely scaled (nm scale) HBT layers based on atomistic simulation and experimental data; (ii) Development of corresponding physical models for use in semi-classical device simulation (such as BTE, DD) for exploring the impact of scaling of the vertical HBT structure on its electrical characteristics. (iii) Exploration of the impact of random atomic arrangement in ultra-thin layers on the variation of electrical SiGeC HBT device and circuit performance beyond standard process tolerances. (iv) Bridging the gap between material science and electrical engineering by establishing a multi-scale simulation capability spanning from atomistic to circuit simulation. The work requires a strong cooperation within a team of researchers at CEDIC and at the project cooperation partners. Participation in progress reports, presentations at project meetings and publications is expected.

Required qualification: Applicants should hold an outstanding Master/Diplom degree in solid-state physics with focus on semiconductor electronics. Experience in the following areas is mandatory: carrier transport physics in electronic devices; computational physics, preferably hands-on experience with numerical device simulation (TCAD) tools such as Boltzmann transport equation and drift-diffusion solvers. Additional knowledge on HBT operation principles and semiconductor technology as well as on atomistic simulation 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>