TECHNISCHE UNIVERSITÄT CHEMNITZ

Institut für Physik
Physikalisches Kolloquium
- Online-Veranstaltung -

Mittwoch, 19.05.2021, um 11:15 Uhr

Dr. Jörg Schuster

Group Leader "Simulation of Processes, Materials and Devices",
Fraunhofer-Institute for Electronic Nanosystems, Chemnitz

Simulation of Processes, Materials, and Devices for Nanoelectronics - Theoretical and Computational Physics for Engineering

Fabrication of more and more powerful electronics devices with low energy consumption and improved functionality requires novel nano-scale device concepts, new materials and the permanent adaption and improvement of fabrication processes. Modeling and simulation of fabrication processes, materials, and devices for nanoelectronics becomes more and more important on the way to digital prototyping of the technology and the required manufacturing processes. Increasing costs of technology development and the decreasing costs of powerful high performance computers drive digital modeling and computational engineering additionally.

As the size of devices shrinks, interfaces, quantum effects and the local atomistic composition of the materials determine the properties and function of nanomaterials and devices. Thus, a number of methods from theoretical and computational physics are required in order to describe the growth and composition of the materials, the structure of interfaces, and the device physics properly. In our group, methods like density functional theory, quantum transport theory, molecular dynamics or kinetic Monte Carlo are in routine use along with classical continuum simulation approaches, which are standard in engineering. Successful transfer of our findings to advanced processing and fabrication of novel devices requires an additional step, translating the results and relevant findings between the languages of physics and engineering.

In this talk, I will explain how we use computational methods from physics in engineering and highlight selected activities of our group in the field of novel nanowire-based devices, carbon electronics and the modeling of nano-fabrication-processes.

Informationen zum Vortrag erteilt:
Prof. Dr. Angela Thränhardt, Tel.: 0371 531 37636