The scientific activities of the Chair of Materials Science and Nanotechnology (Prof. G. Cuniberti), Institute of Materials Science, are focused on developing non conventional strategies for novel materials and devices with intrinsic nanoscale complexity.

Within the Cluster of Excellence Center for Advancing Electronics Dresden (cfAED, www.cfaed.org),

2 PhD student positions

to work on the following topics will be available at our chair for 3.5 years starting at January 1, 2013:

1. **Bioanalytical platform: convergence of biomolecules and integrated silicon nanowire FETs**

   The main goal is to develop a chip with an array of silicon nanowire FETs, capable of sequencing fragments of the genome or defining the gene expression level. This nanowire based biochip concept positions itself as an efficient alternative to the existing DNA microarrays, representing an array of probe DNA printed directly onto the nanowires FET “spots”. This array should be exposed to a library of amplified target DNA to allow hybridization of the complementary base pairs. Hybridization events at the surface of the nanowires strongly influence the electrical conductance, depending on the amount of the probe and target molecules and their complementarity. The design of the device involves in particular the implementation of silicon nanowire FETs and the biochemical engineering of the surface of the nanowires in order to covalently attach the probe DNA sequence.

2. **Design of low-ohmic contacts for CNTFETs**

   This project concerns the study of the interface between carbon nanotubes (CNT) and electrodes with atomistic simulations of realistic geometries in order to create structurally stable, low-ohmic contacts for the use in field effect transistors (FETs). The research will focus on computational modeling of the atomic structure of the contacts, the determination of the structural stability of the contact and on electron transport calculations for the specific contact models. The fusion of these techniques in Finite Elements Methods will be pursued in view of the extraction of relevant input parameters for compact modeling.

We expect applications from highly motivated individuals holding a master’s degree or a university diploma in a relevant subject area (Physics, Materials Sciences, Chemistry Electrical Engineering or related).

For more information on the application process and an overview of all open positions within the Cluster of Excellence, please refer to the Cluster homepage:
http://tu-dresden.de/exzellenz/exzellenzcluster/cfaed/recruitment/phdstudentpositions

**Application Procedure:** Your application in English must include: motivation letter, CV, copy of degree certificate, transcript of grades (i.e. the official list of coursework including your grades), proof of English language skills.

Complete applications should be submitted preferably by E-mail to the cluster management as a single PDF document quoting the reference number PhD1201 and the topic in the subject header to recruiting.cfaed@tu-dresden.de or alternatively to: TU Dresden, cfAED, Herrn Prof. Gerhard Fettweis, 01062 Dresden, Germany.

The closing date for applications is **19 October 2012** (stamped arrival date of the university central mail service applies).

**Shortlisted applicants will be invited to the cfAED PhD Recruitment Meeting in Dresden, Germany in November 2012.**