Einladung
zum
Physikalischen Kolloquium
Montag, 01.12.2014
16:15 Uhr in N24/H13

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Institute of Solid State Physics
- Electron Microscopy -

Quantitative Transmission Electron Microscopy: From strain to imaging beyond the diffraction and information limits
The structure of a material determines its electronic and optic properties such as conductivity, mobility of charge carriers, band gap as well as absorption and emission characteristics. Answering the question “Which atoms are where?” is thus the main goal of transmission electron microscopy (TEM). In this talk I will explain quantitative TEM methods which allow us to reach different aspects of this aim by evaluation of image contrast. The image below shows a measurement of atom column positions in ultrathin gold nanowires, revealing wrinkling of atomic planes caused by anisotropic surface stress. This image was obtained by illumination of the specimen with an approximately plane electron wave and spherical aberration corrected imaging. But also scanning TEM techniques play an important role for measurement of strain and composition. In this context I will explain how nano-beam electron diffraction can be employed to quantify strain and how scanning TEM combined with a high-angle annular dark field detector can be used to evaluate the local composition in ternary and quaternary semiconductors by comparing images of atomic columns with image simulation. In the last part of my talk I will explain a most recently developed TEM method which almost doubles the spatial resolution of aberration corrected imaging by replacing the incident plane electron wave with incoherent illumination.

Ab 15.45 Kaffee, Tee und Kekse vor dem Hörsaal H13
Organisation: Prof. Jelezko, Tel. 23750
Host: Prof. Kaiser, Tel. 22950, off.: 22951