

## HL 56: Invited Talk: Holger Eisele

Time: Wednesday 14:30–15:00

Location: POT 51

**Invited Talk** HL 56.1 Wed 14:30 POT 51  
**Cross-sectional Scanning Tunneling Microscopy on Semiconductor Nanostructures** — •HOLGER EISELE — Institut für Festkörperphysik, Technische Universität Berlin, 10623 Berlin

The growth of semiconductor nanostructures is crucially determined by kinetic, thermodynamic, and quantum mechanic effects. In order to obtain optimized opto-electronic properties a detailed understanding of atomistic processes during growth is necessary. Here, cross-sectional scanning tunneling microscopy provides a unique access to the spatial structure of semiconductor nanostructures embedded in devices.

The principle of application of cross-sectional scanning tunneling microscopy on different semiconductor nanostructures will be presented in this contribution. In particular, it will be shown how to determine

the main spatial parameters as they are the size, the shape and the stoichiometric arrangement of the constituent materials.

Among the wide variety of semiconductor nanostructure systems, this contribution will concentrate on examples. For InAs/GaAs a material reorganization during the capping is observed, which determines mostly the quantum dot structure [1]. In the InAs/InGaAsP/InP system the influence of the quaternary separation layers on the quantum dash stacking and the strain field is demonstrated [2]. During submonolayer InAs/GaAs growth quantum dot like structures form [3].

[1] H. Eisele, A. Lenz, R. Heitz, et al., *J. Appl. Phys.* 104, 124301 (2008). [2] A. Lenz, F. Genz, H. Eisele, et al., *Appl. Phys. Lett.* 95, 203105 (2009). [3] A. Lenz, H. Eisele, J. Becker, et al., *Appl. Phys. Express* 3, 105602 (2010).