

MM 17: HV Schmitz

Time: Tuesday 9:30–10:00

Location: H16

Invited Talk

MM 17.1 Tue 9:30 H16

Interfaces in nanostructured matter — ●GUIDO SCHMITZ — Inst. für Materialphysik, WWU Münster

Nanostructured materials naturally comprise interfaces in high density, reason enough to investigate their chemical structure in detail. The talk considers the impact of interfaces to stability and reaction of nanostructures. What is the natural thickness of interphase boundaries, how do new reaction products nucleate and grow at interfaces, what is the effect of interfacial curvature in core-shell nanospheres?

To answer these questions from an experimental point of view, state-of-the-art atom probe tomography is performed. Based on laser-assisted field evaporation of single atoms, this technique delivers chem-

ical maps of outstanding spatial resolution. Due to its real 3D information, it is especially suited to the investigation of complex morphologies distinguished by curved and rough interfaces.

Based on nano-analysis of thin films and multilayers, it is shown (i) that the natural width of interfaces and its temperature dependence can be made responsible for the degradation of giant magnetoresistivity, (ii) that grain boundary transport may appear heterogeneously along 1D pipe structures, (iii) that nucleation of product phases at interfaces requires a preceding mixing on the length scale of a few nanometers, and (iv) that the reaction of spherical core-shell nanostructures may depend on the layer stacking sequence with respect to interfacial curvature.