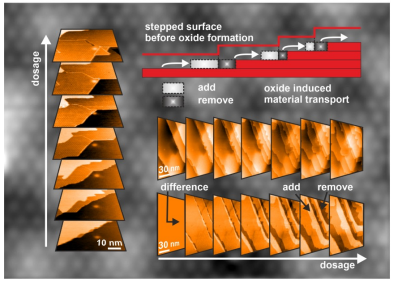
Physical Chemistry
Sebastian Günther

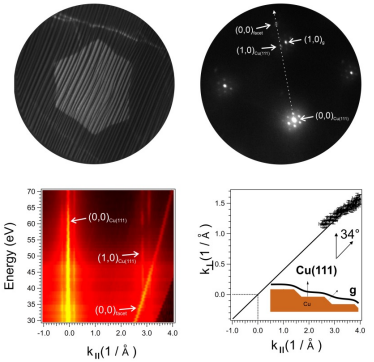
Surface Science and Catalysis

We investigate surface processes and catalytic reactions on technical and model systems. Photoelectron- and mass spectroscopy is used to relate the catalytic performance of technical catalysts and porous nano-materials to their surface properties. We also combine spectroscopy and microscopy in order to image catalytic processes on single crystal model systems using scanning tunneling microscopy (STM) and various photoelectron microscopies at synchrotron facilities. Also experiments at near ambient conditions are addressed which require the sealing of so-called environmental cells with electron transparent membranes. For this purpose, graphene is synthesized in our group by chemical vapor deposition with control at the atomic level as a potential high-quality ultra-thin membrane material.

Oxidation of $Ni_3Al(111)$



Graphene on Cu



$NiAlO_x$ Catalysts

collab. Prof. O. Hinrichsen

Co-precipitation of Ni- & Al-nitrate at ph 9

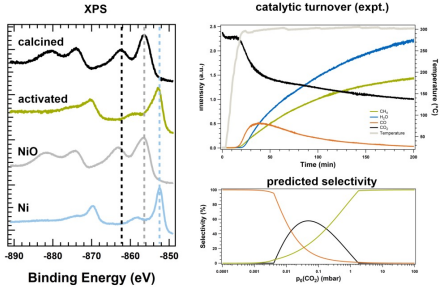
Washing, Drying

$NiAl_xO_y$ mixed oxide

CO_2, H_2

CH_4

Calcination, Activation, Reaction



PdGa nano

collab. Prof. R. Fischer

C_2H_2, H_2

C_2H_4

C_2H_6