

# SUMMER SCHOOL

## High Resolution & Analytical Microscopy

- Virtual lectures:
  - by Prof. Dr. G. Schmitz and leading scientists in their field
- Laboratory sessions (9:00-13:00 and 14:00-18:00):
  - in groups of 2-3 people
  - including a technique expert
- Literature and computers for open access:
  - available in seminar room 2R04
- Skills to be aquired:
  - theoretical and practical understanding
  - sample preparation for electron microscopy & atom probe tomography
  - performing TEM, SEM & APT research
  - interpretation and evaluation of the results

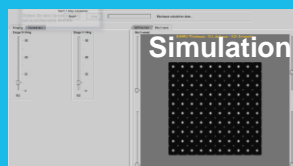
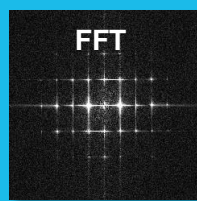
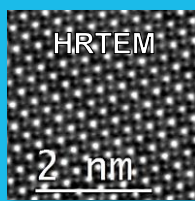
**24.09. – 14.10.2020**

**Institute for  
Materials Science  
(Max-Planck-Institute)  
Heisenbergstraße 3  
70569 Stuttgart**

### TEM – Transmission Electron Microscopy

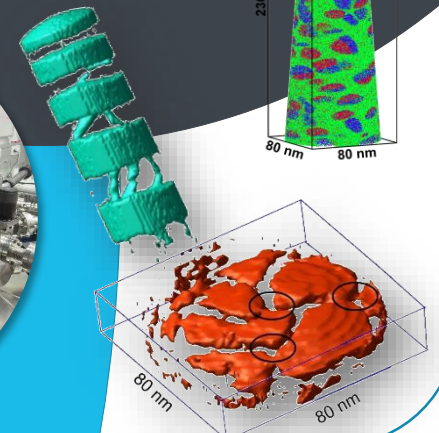


- 1. Part: TEM session**
  - High resolution imaging
  - Diffraction techniques (convergent beam vs. parallel illumination)
  - Contrast mechanisms
- 2. Part: Simulation and Image Analysis**
  - Contrast transfer function
  - Dynamical calculations (Bloch wave method / multislices)
  - Diffraction pattern analysis
  - CBED analysis



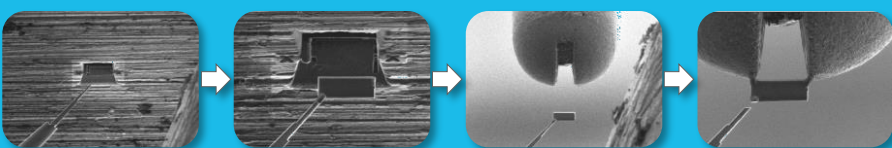
### APT – Atom Probe Tomography

- Compositional analysis on smallest length scales
- Three dimensional reconstruction
- Interface & cluster analysis



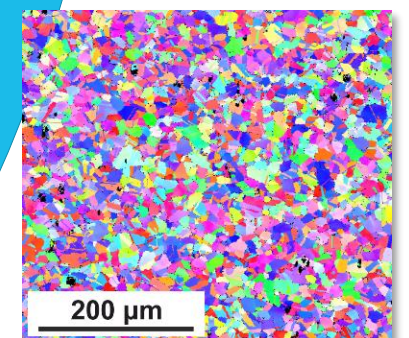
### FIB SEM – Focused Ion Beam assisted Scanning Electron Microscopy

- Controlled work on smallest length scales
- Site specific preparation of TEM and APT specimens



### EBSD - Electron BackScatter Diffraction

- Visualization of crystal orientations
- Kikuchi Patterns
- Mapping techniques (pole figures, misorientation maps, strain maps, texture analysis)
- Sample preparation for EBSD



### Registration

For students: - on **C@MPUS-Management-Portal**  
 For externals: - **e-mail** to [jacqueline.dunn@imw.uni-stuttgart.de](mailto:jacqueline.dunn@imw.uni-stuttgart.de)  
 - or directly at the chair administration office **2Q09**,  
 Max-Planck-Institute, Heisenbergstraße 3, 70569 Stuttgart