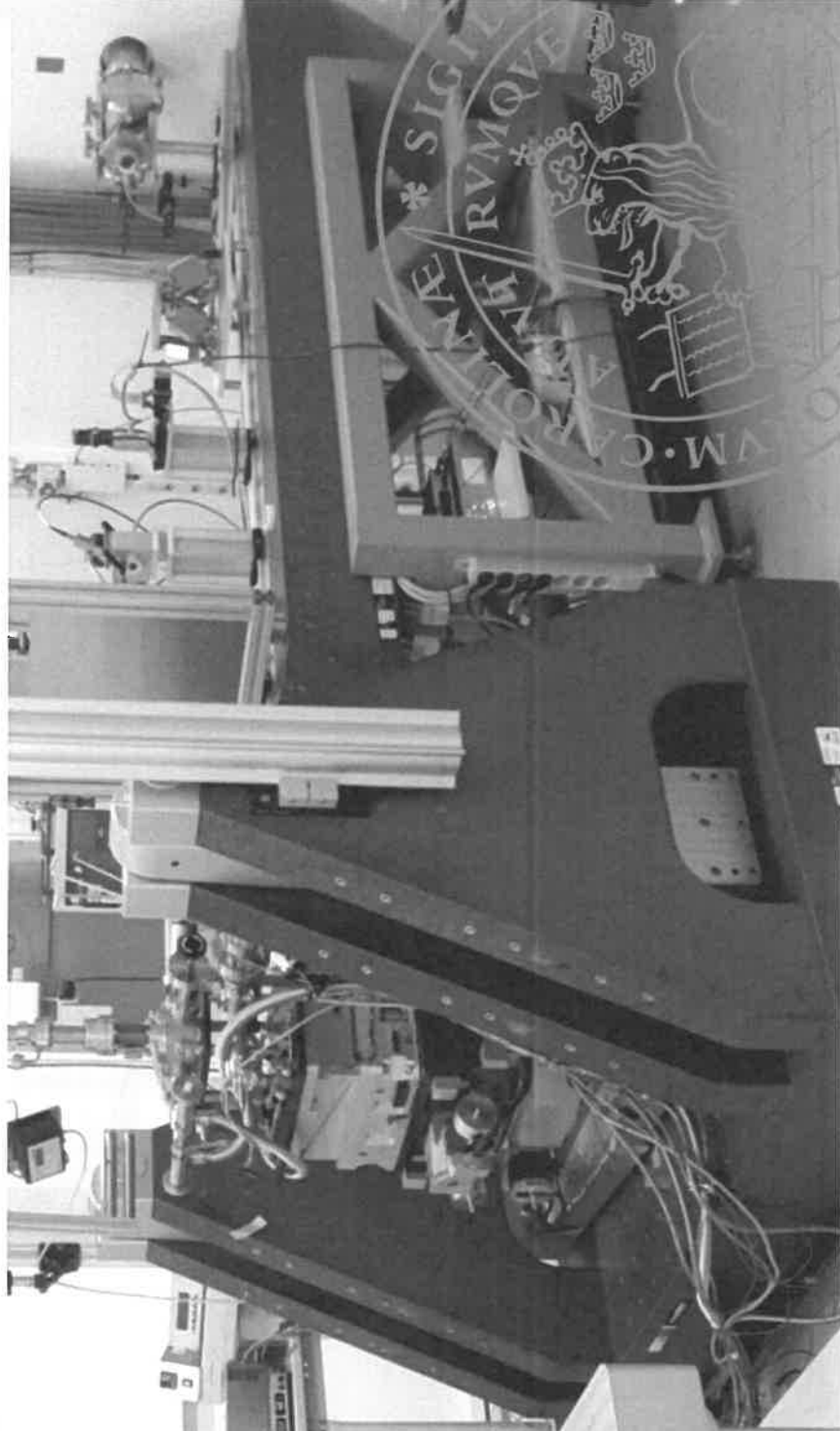


Surface related research at SMS on PETRA IV

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Focus research areas

- Heterogeneous catalysis
- Electrocatalysis
- Electrochemistry/Electrolysis
- Corrosion



Methods

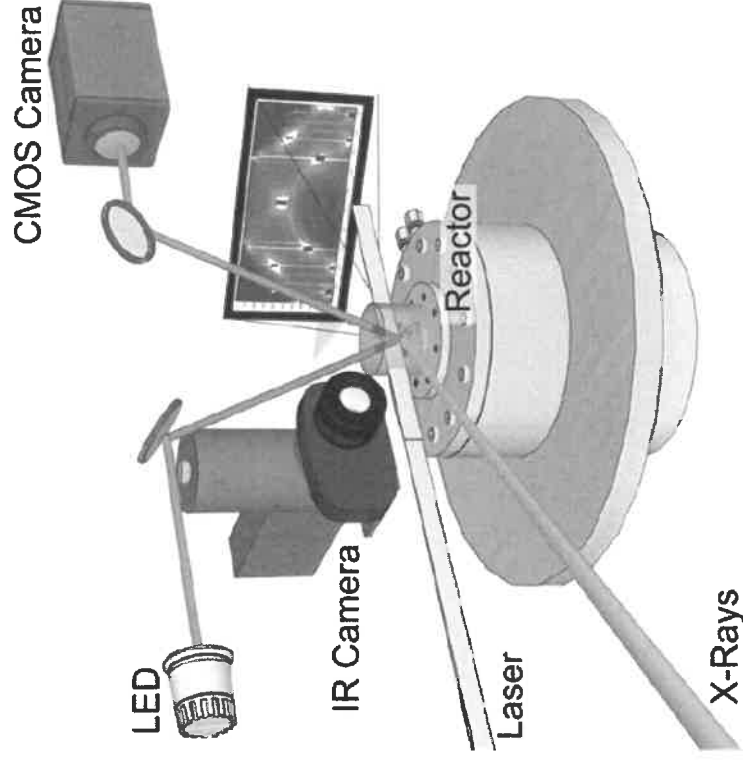
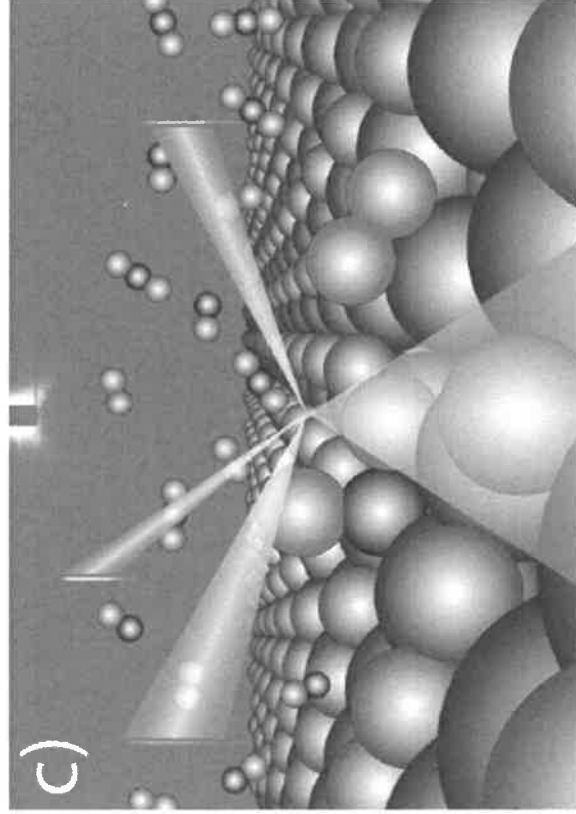
Operando, combined simultaneously

- X-ray diffraction
 - Surface X-ray diffraction
 - Grazing incidence X-ray diffraction
 - Transmission (surface) diffraction
- (Grazing incidence) small angle scattering
- X-ray reflectivity

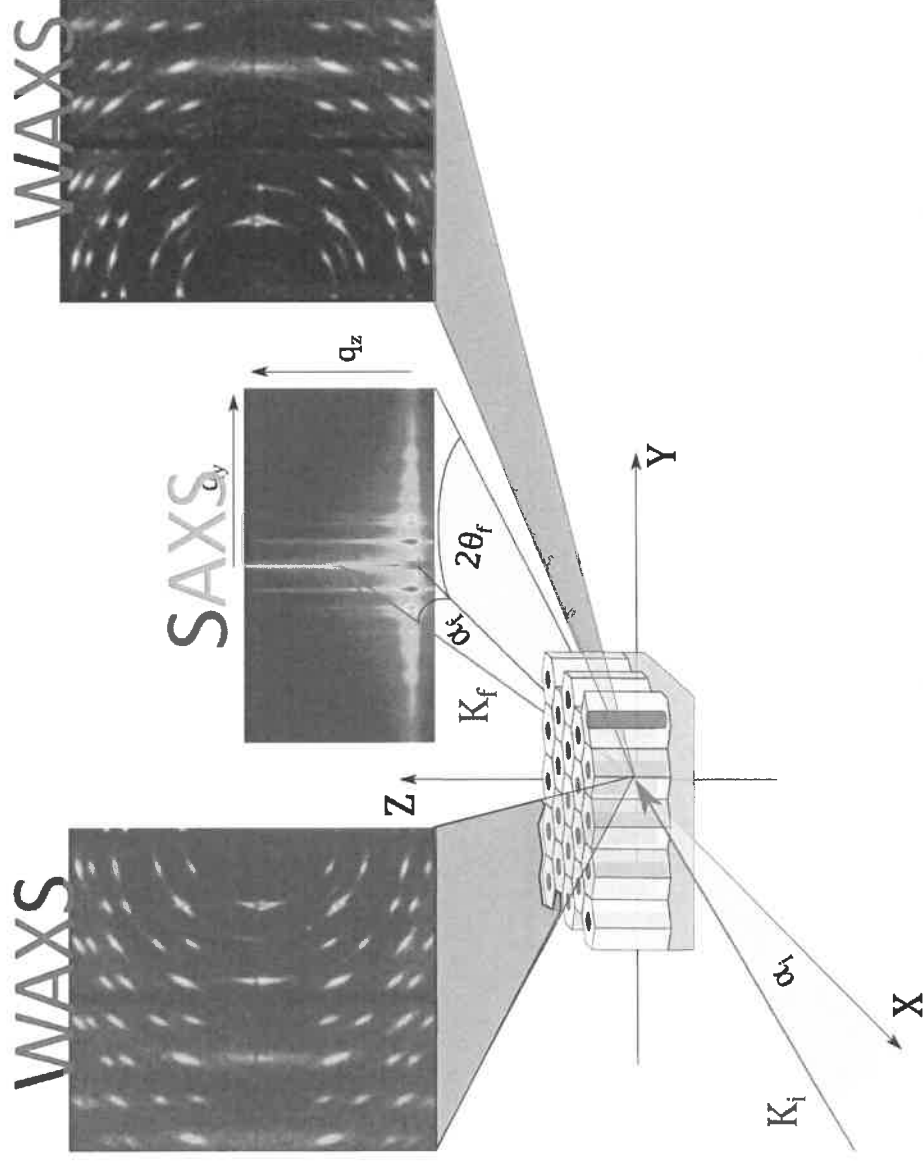
Spatially resolved

- Mass spectrometry
- Surface optical reflectance
- Planar laser-induced fluorescence
- etc

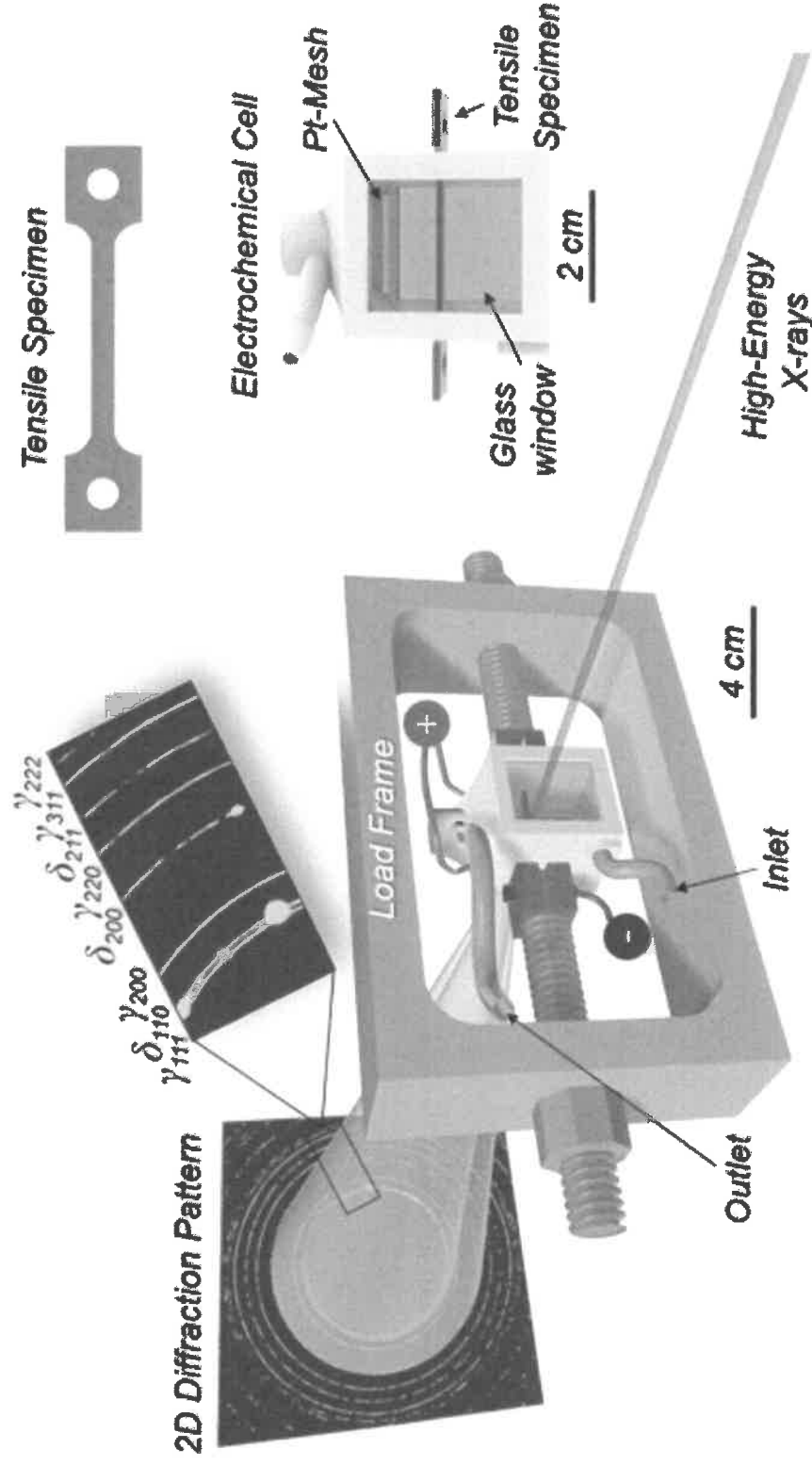
Operando Catalysis



Operando SAXS and WAXS studies during electrodeposition in nano-confinement



Operando time- and space-resolved high-energy X-ray diffraction



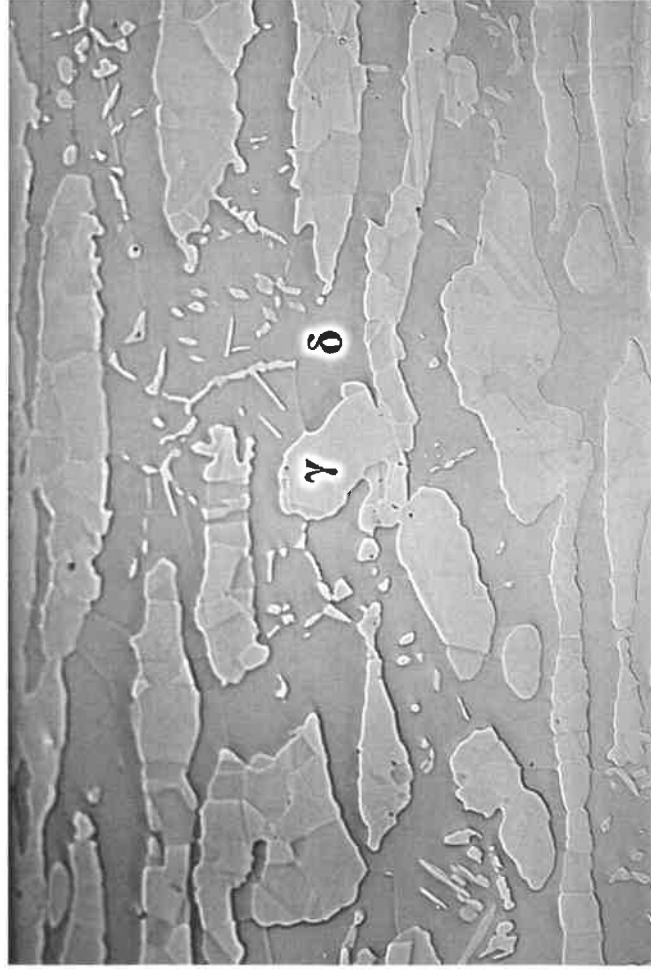
Cem Örnek et al., Corrosion Science 175 (2020) 108899



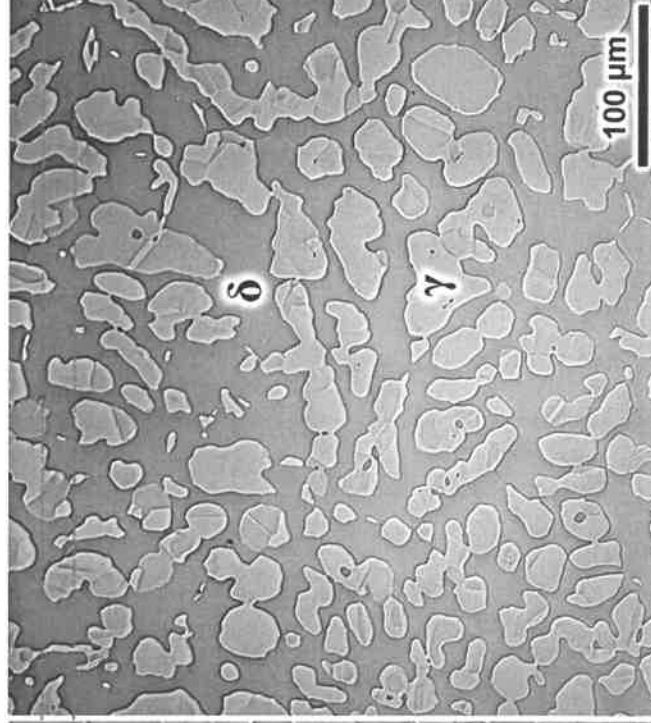
LUND
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Operando time- and space-resolved high-energy X-ray diffraction

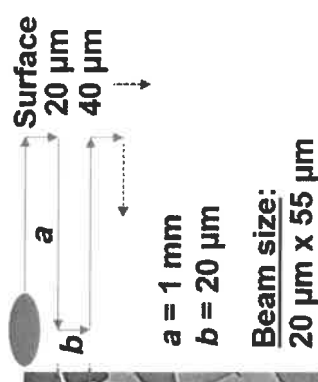
(a) Longitudinal Cross-section



(b) Transverse Cross-section



(c) Scan Pattern



Advantages with high energy X-rays

- Penetration through sample environments
- Speed of measurements
- Large Q range

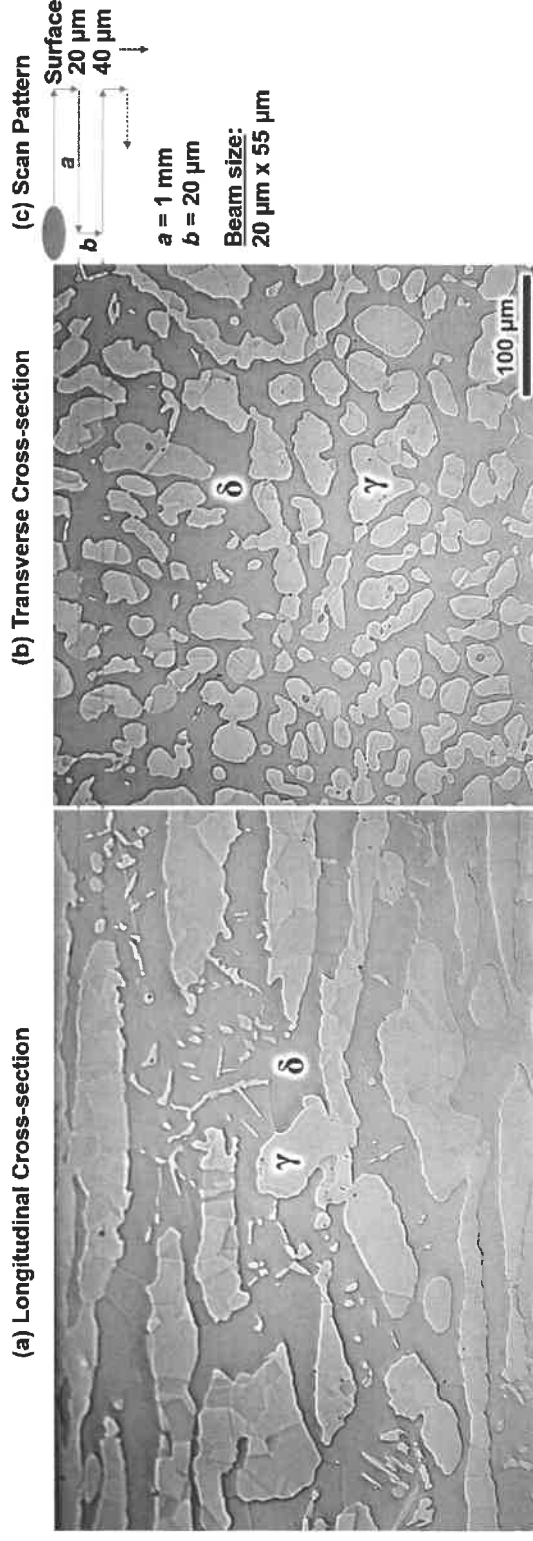
Possibilities with PETRA IV

Small beam size

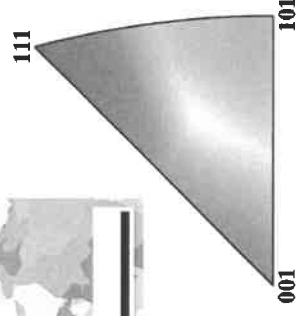
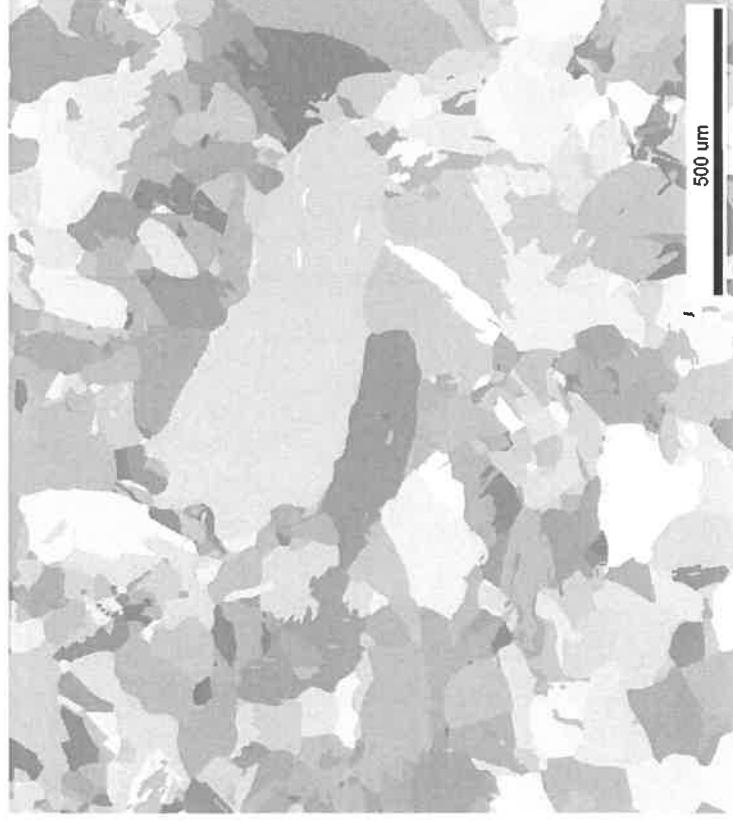
Scanning transmission diffraction

Diffraction from single grains and particles.

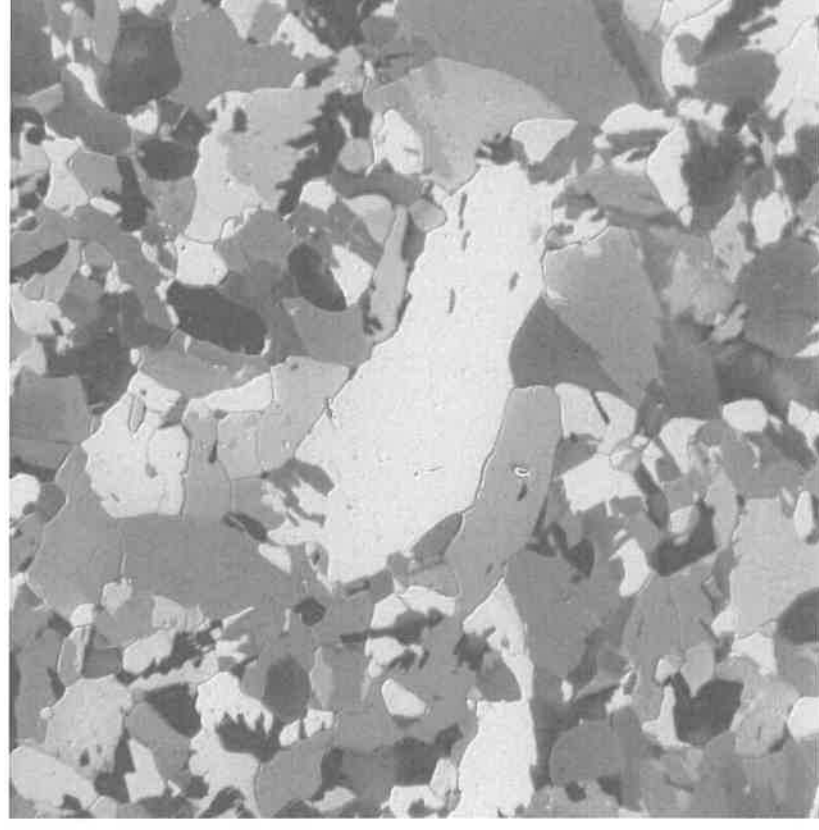
“Surface tomography”



CO oxidation over polycrystalline Pd Surface optical reflectance



Electron Backscatter Diffraction



Sebastian Pfaff et al., unpublished





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