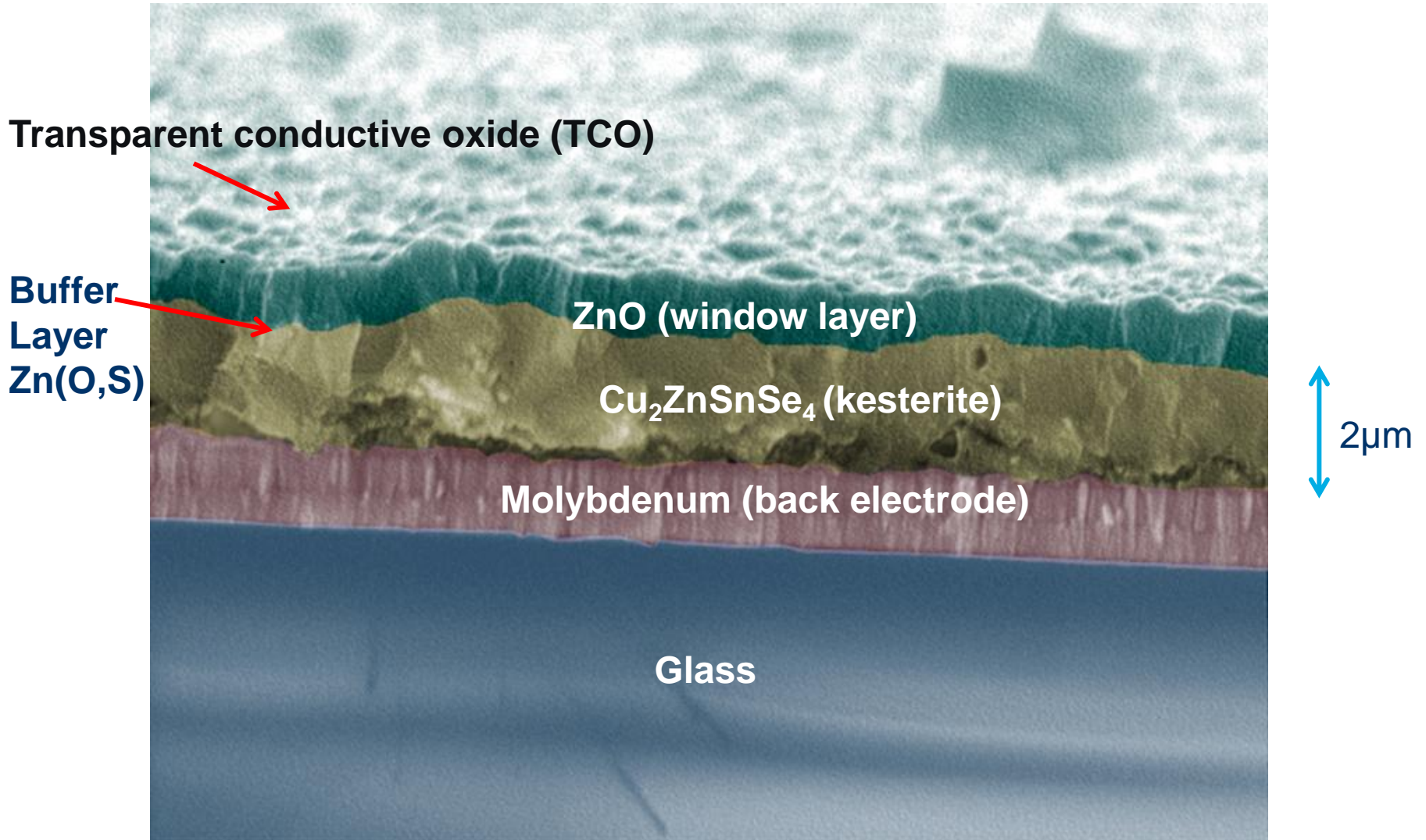
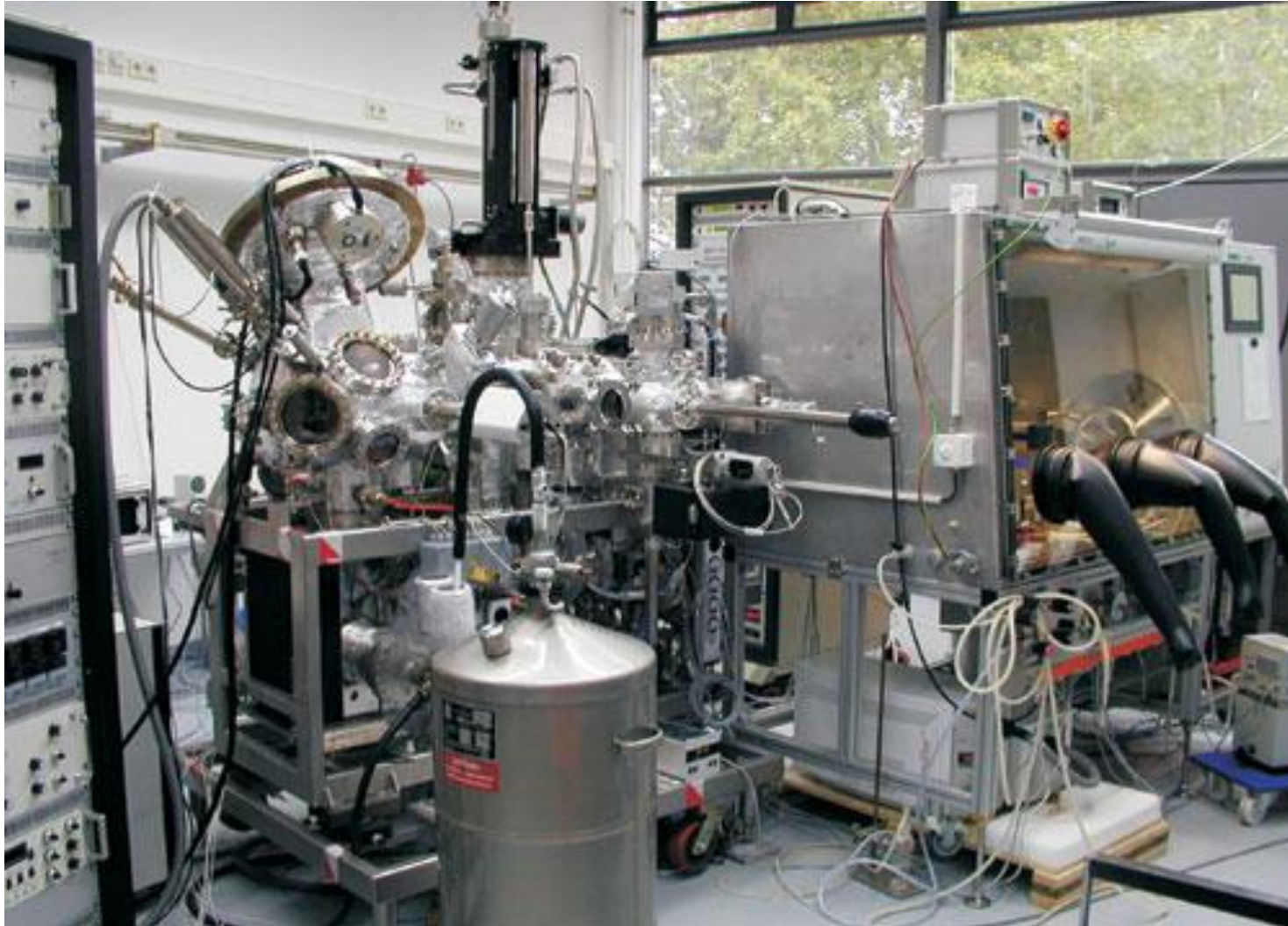
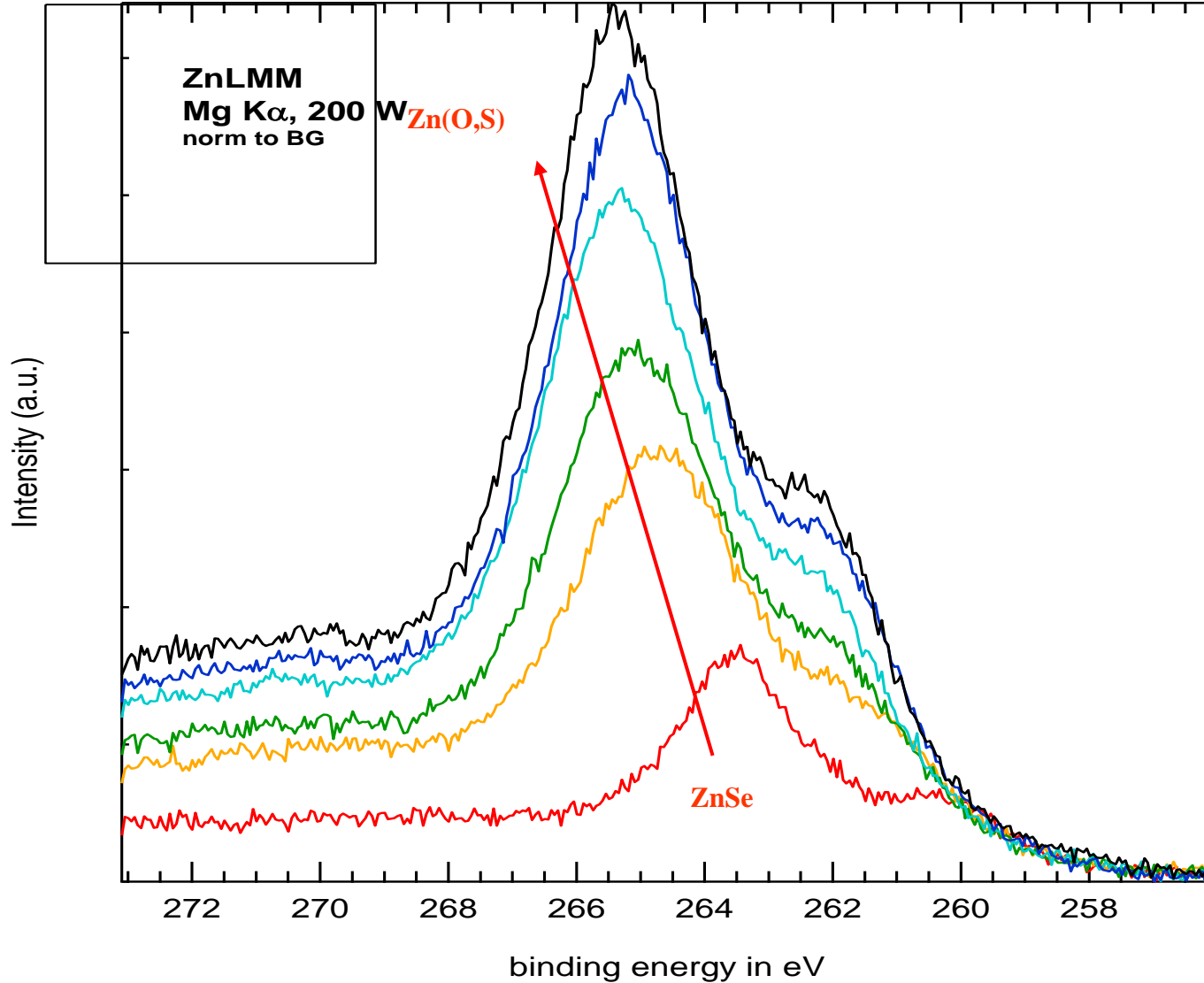


What is a thin film solar cell?



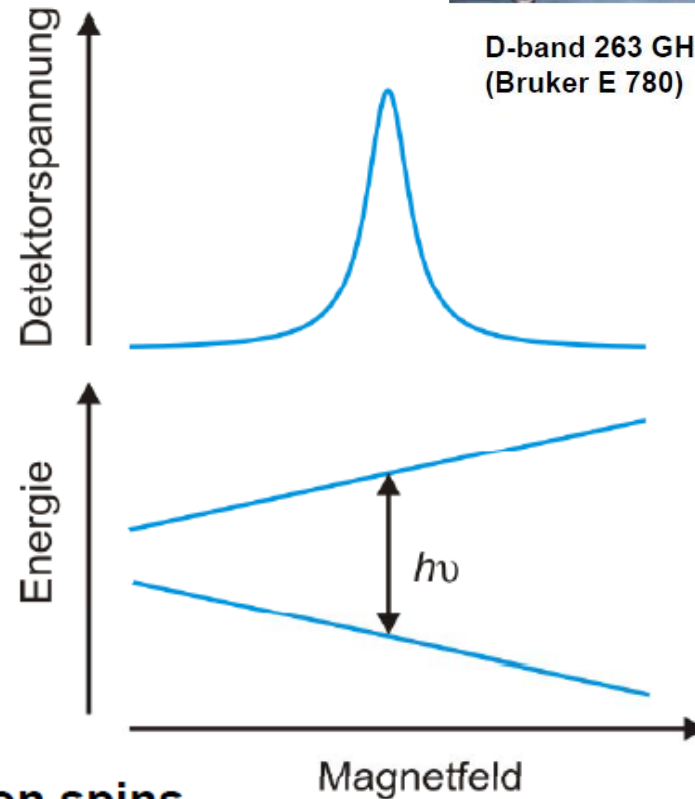
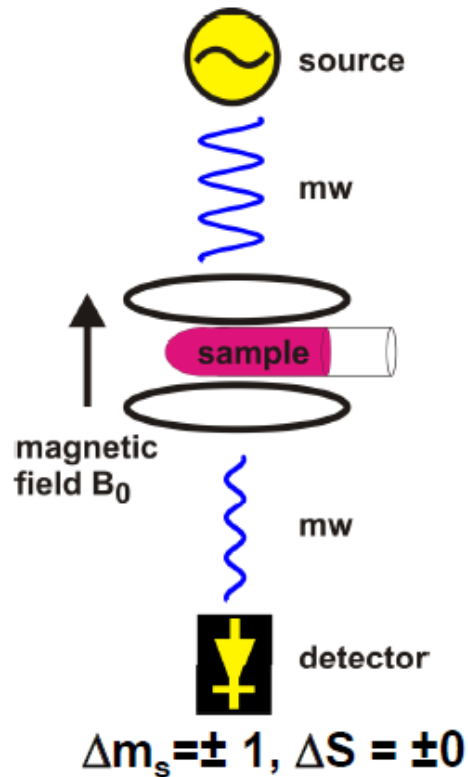






D-band 263 GHz spectrometer
(Bruker E 780)

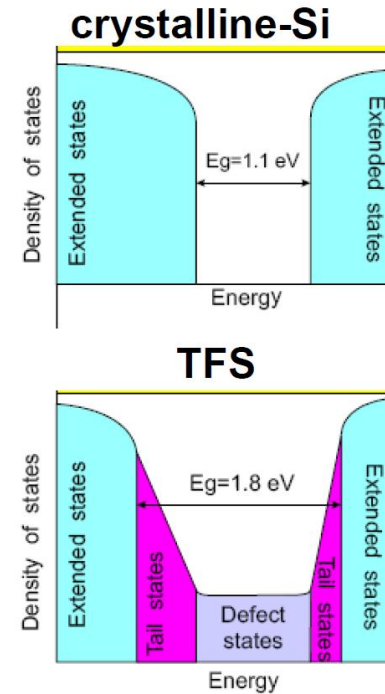
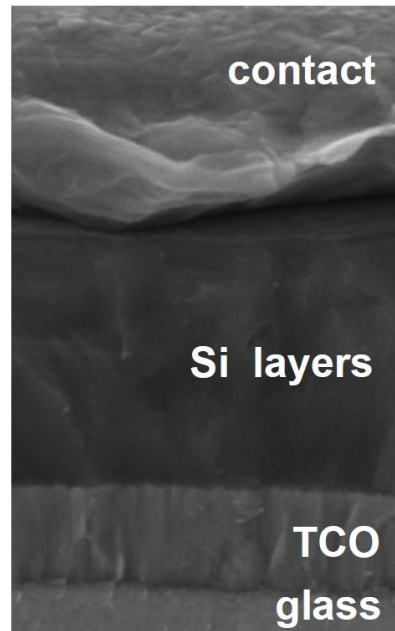
Electron spin resonance ESR
and Electron Paramagnetic Resonance (EPR) are synonyms



External magnetic field aligns electron spins
Electro magnetic waves flip the spins

A. Schnegg, HZB

Thin film silicon (TFS) solar cell

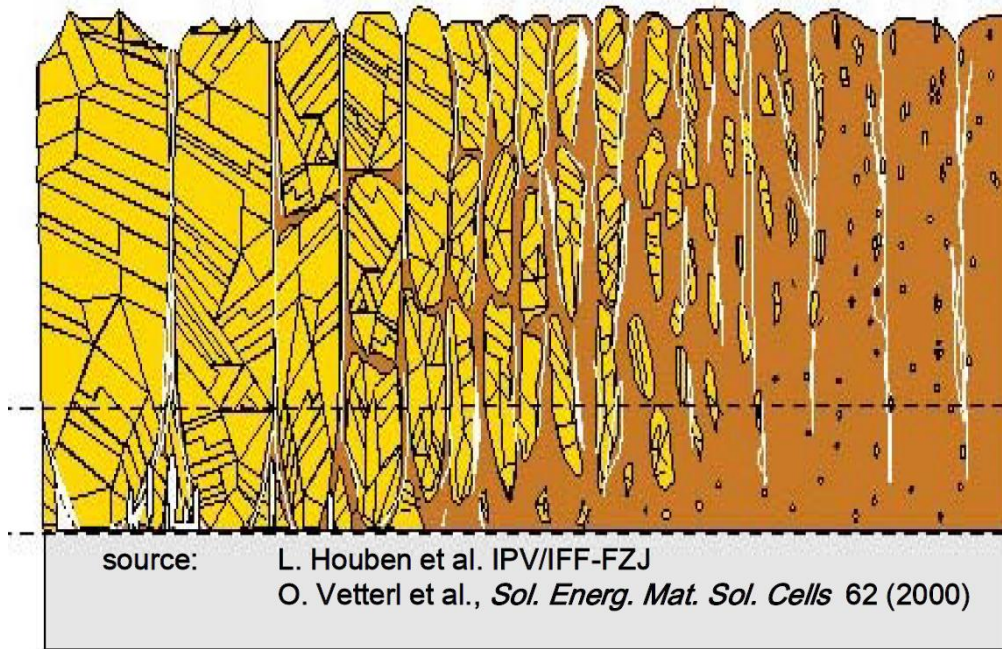


- ➔(Paramagnetic) states in the band gap limit solar cell performance
- ➔Multi scale analysis to study structure function relationship

A. Schnegg, HZB

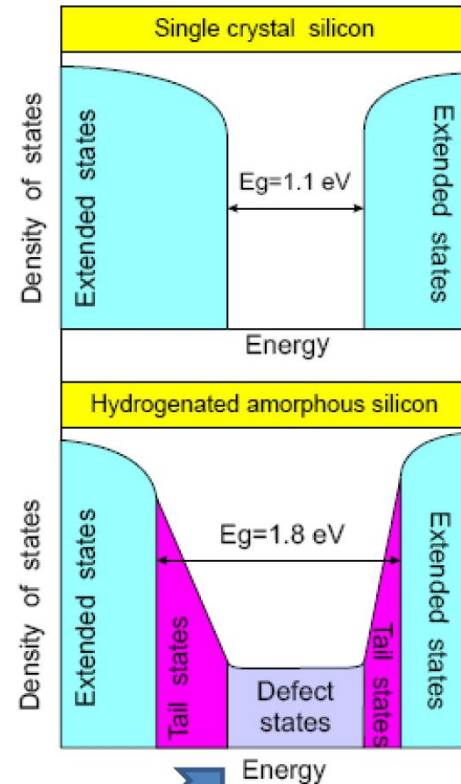
influence of deposition parameters: silane concentration, power, frequency, temperature, ...

decreasing crystalline fraction →



 crystallites
  amorphous region
  voids

A. Schnegg, HZB



Paramagnetic states limit solar cell performance