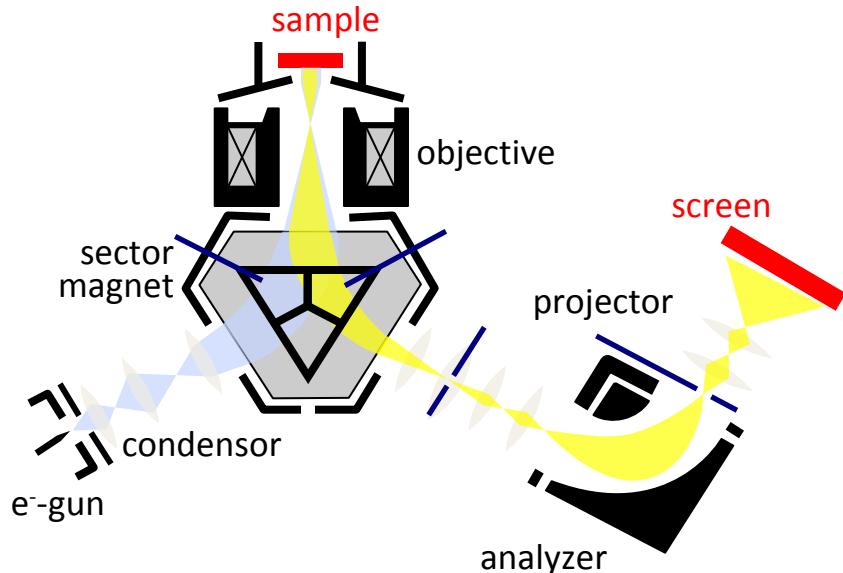


# Ru(0001) Oxidation

## IV-LEEM: Structural fingerprinting during chemical reactions

### Low-Energy Electron Microscopy



- Video-rate surface imaging
- 8 nm lateral resolution
- Sub-nm vertical resolution
- **Pressure: UHV -  $10^{-5}$  torr**
- **Temperature: 150 - 2000 K**

J.I. Flege, P. Sutter, Phys. Rev. B **78**, 153402 (2008).

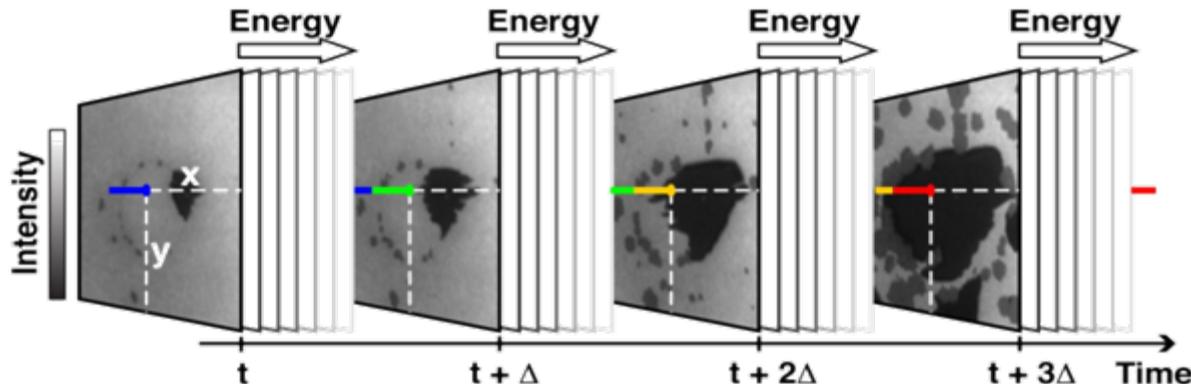
J.I. Flege, J. Hrbek, P. Sutter, Phys. Rev. B **78**, 165407 (2008).

### Intensity-Voltage (IV) LEEM

Energy dependent electron reflectivity, I(V)  
→ Identification of near-surface structures.

#### Oxidized Ru(0001):

- Coexistence of (1x1)-O, surface oxide,  $\text{RuO}_2$ .
- Transformations between these surface phases.
- Measure properties, e.g., catalytic activity.



Local I(V) characteristic = time-dependent **structural fingerprint** at each image pixel.

