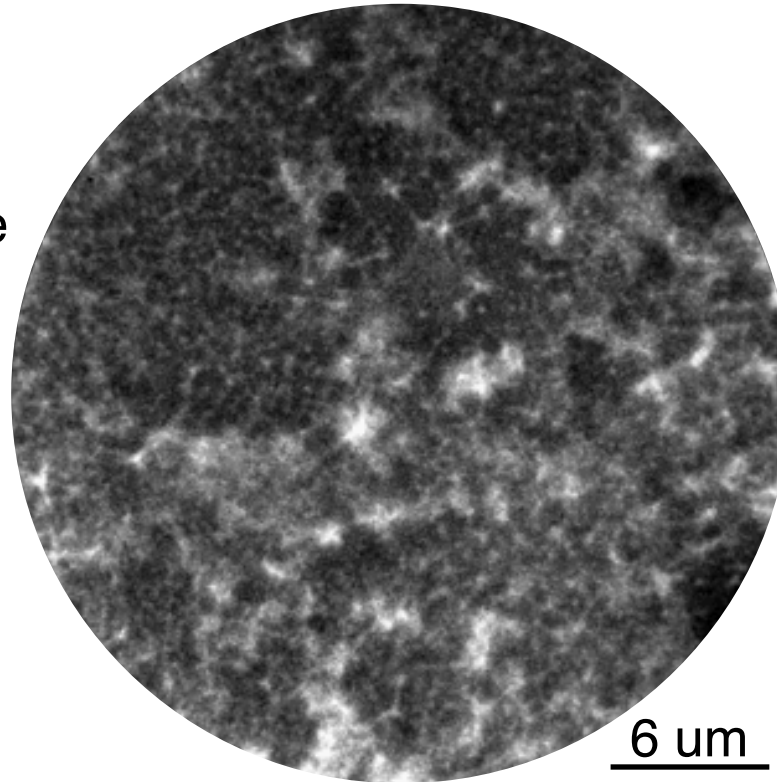


What Can We Do with Low Energy Electron Microscopy?

A technique Using low energy elastically back-scattered electrons

- Imaging
 - Microscopy
 - Diffraction
- on conductive surface

- Energy 0 – 100 eV
- Wavelength $\lambda \geq 1 \text{ \AA}$
- Surface sensitive

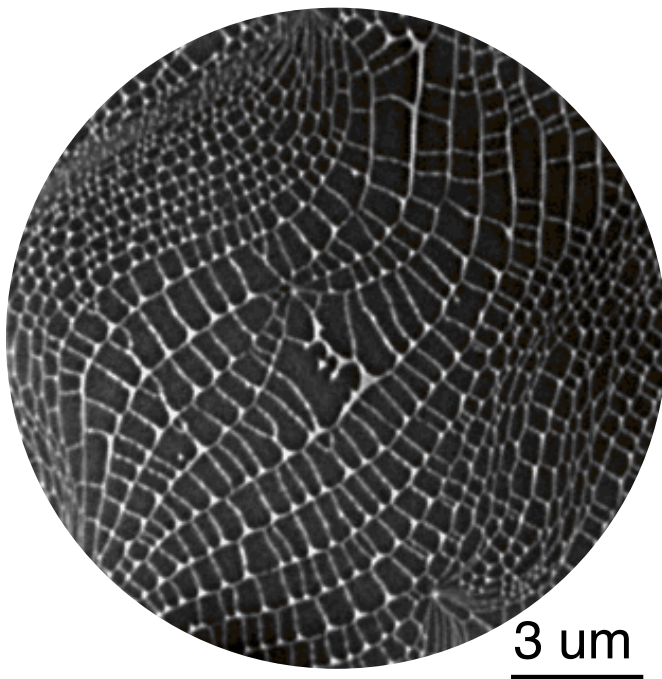


- Temperature
- Electron energy
- Gas Dosing
- Material Deposition
- Time
-

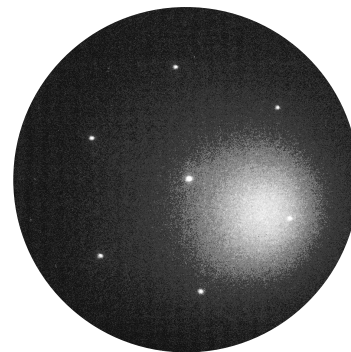
Surface Dynamics of
Si(111)@900°C

Phase Transition Between 7×7 and 1×1 on Si(111) Surface

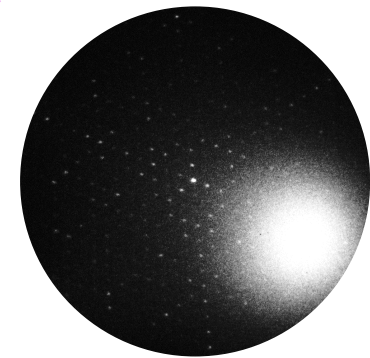
Transition temperature range
650°C ~ 670°C



Phase Transition



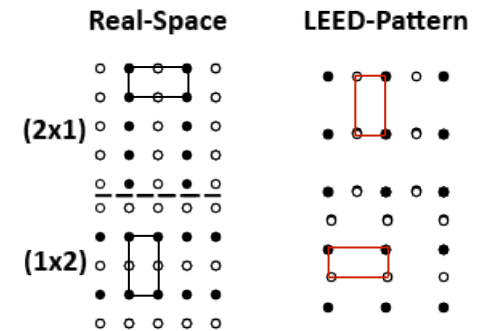
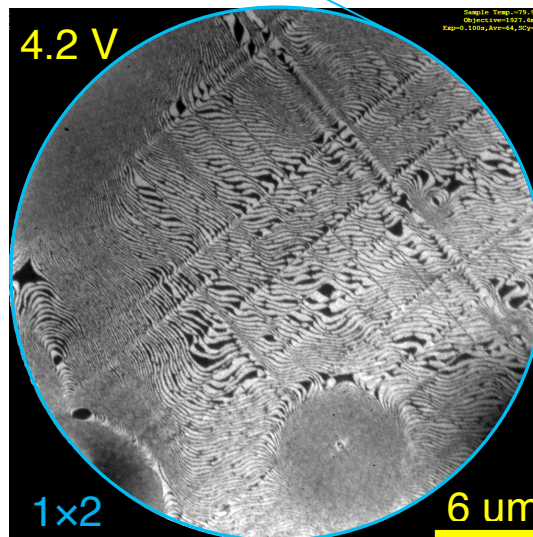
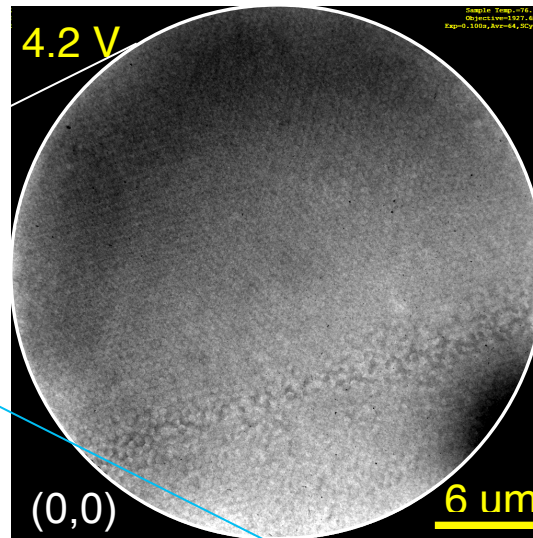
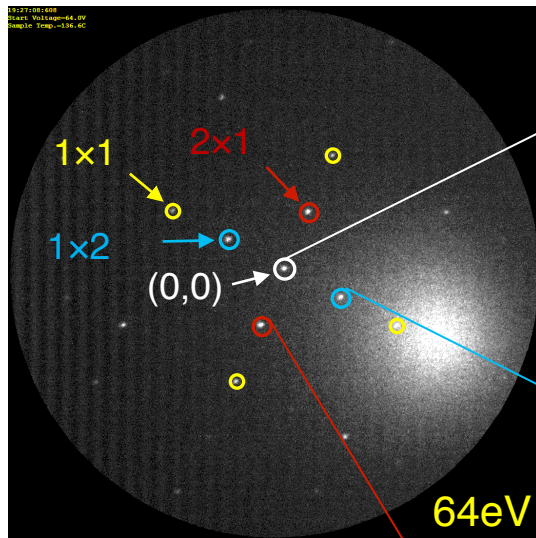
1×1 @ 720°C



7×7 @ 563°C

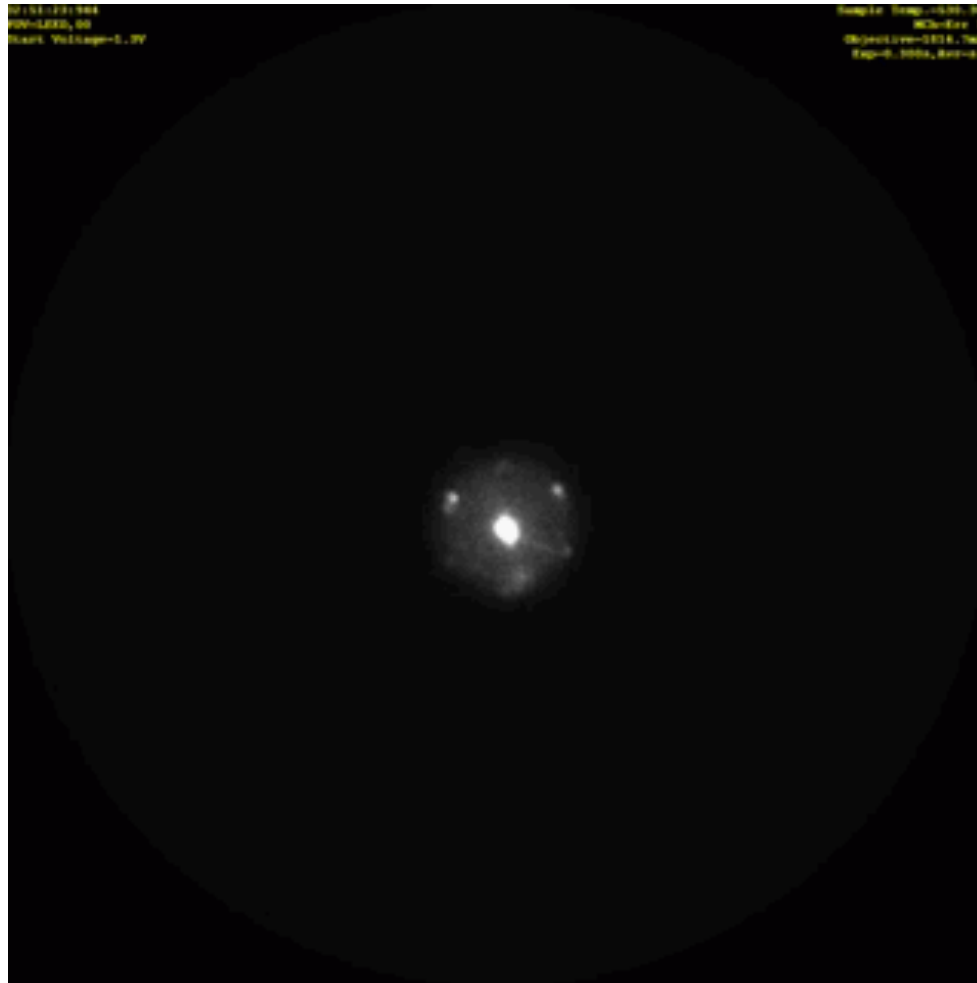
- Dark area 7×7, bright area 1×1
- 7×7 domain start from the step edge and grow along the up step direction

Bright and Dark Field Images on Si(100)



In Dark field image, **only domains** that contribute to the selected LEED spot become bright.

Very sensitive to materials with different domains or rotation angles.



Energy Ramp of Low energy electron diffraction (LEED)