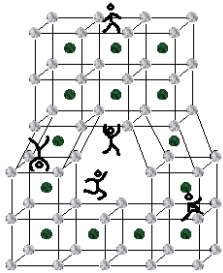


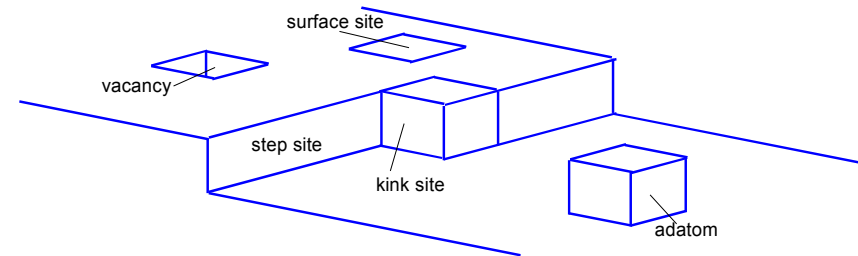
Planar Defects



- Planar (2D Defects)
 - Surfaces
 - Surface Reconstruction
 - Thin Films
 - Grains
 - Twins and Stacking Faults

MATS275: INTRODUCTION
TO MATERIALS SCIENCE

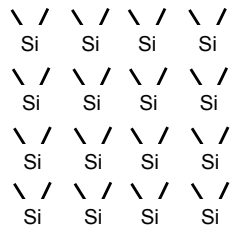
A Defect That **All** Materials Have



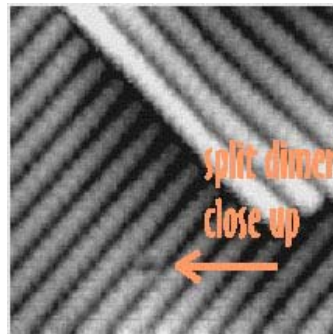
Increasing Energy
 Surface site < vacancy < step site < kink site < adatom

Surface Reconstruction

Silicon 2 x 1 (100) reconstruction
to form "dimer rows"

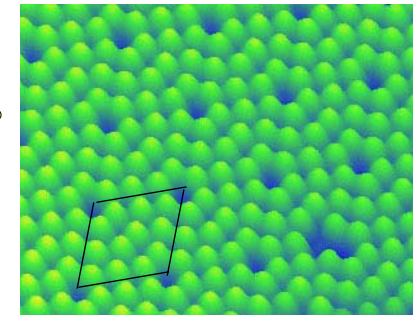
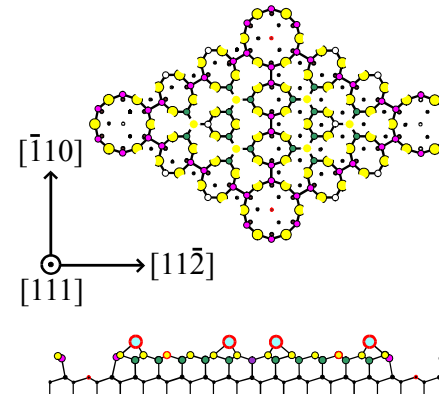


Silicon (100)
unreconstructed surface



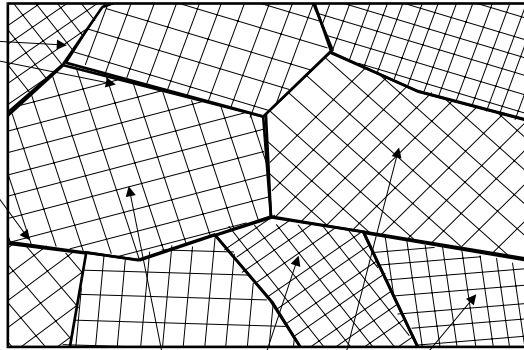
<http://www.unc.edu/~mlejane/Chem/chem.html>

Si 7x7 (111) Reconstruction



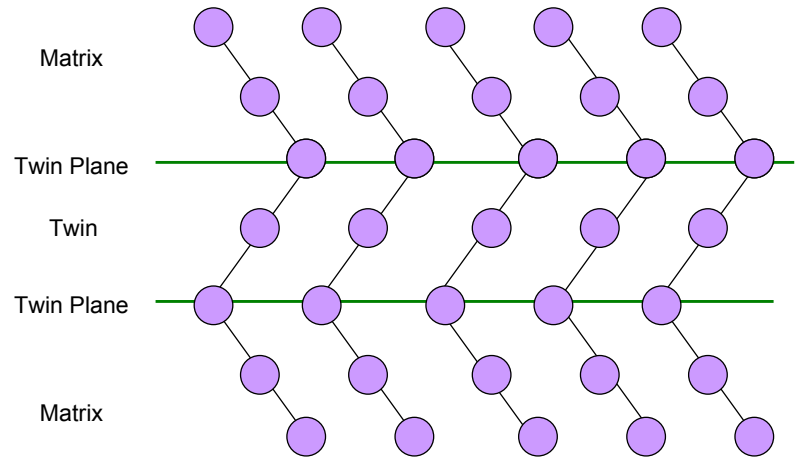
Crystalline Grains

Grain Boundaries



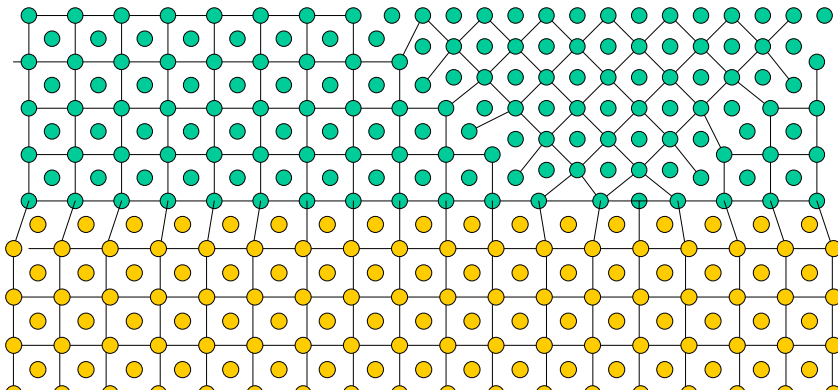
"Grains"
Differently Oriented Crystals

2D of Twin



TWINNING

- To relieve strain in epitaxy...



Precipitates (Volume Defect)

