UNIVERSITÄT SIEGEN

FESTKÖRPERPHYSIK

Crystallography (winter semester 2017)

2. Homework *2D lattice planes and crystal morphology.*

1. For given 2D lattice with following lattice constants:
a) a=5, b=5, α=90°
b) a=5, b=5, α=120°
c) a=7, b=8, α=105°

to draw **a*, b*** (the reciprocal basis vector**)** and calculate the reciprocal lattice constants.

2. Depict the lattice planes, which have the following Miller indices *h*, *k*
a) (1,0)
b) (3,1)
c) (2,1)
d) (1,2)
e) (1,-3)

Find a system of atomic planes where the pair of basis vector $\mathbf{A}_1=[u_1,v_1]$ and $\mathbf{A}_2=[u_2,v_2]$ describe the following translation:
a) within the lattice planes
b) between adjacent lattice planes

3. Calculate the Miller indices *h*, *k* for the lattice planes of Figs 1-4 (*see below*). Find the corresponding reciprocal lattice vectors and the corresponding basis vector $\mathbf{A}_1$ and $\mathbf{A}_2$ (Def. in 2)

4. Define the Miller indices of all crystal facets, which are shown in Fig. 5 and Fig. 6 (*see below*). Please draw the system of the Miller planes corresponding to the crystal facets.

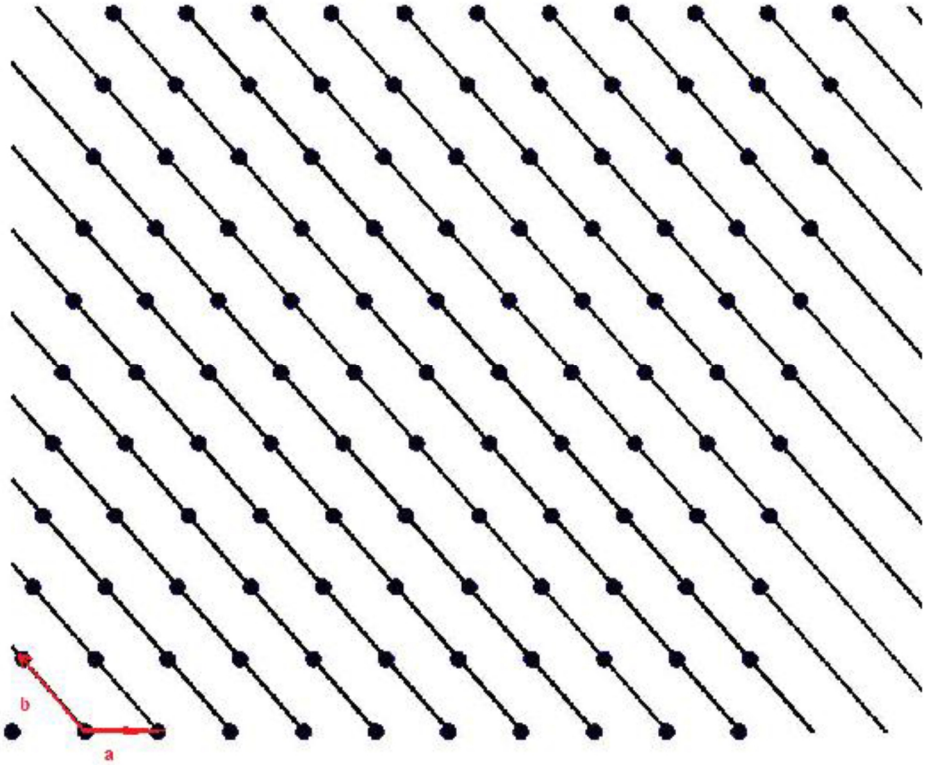

Fig. 1

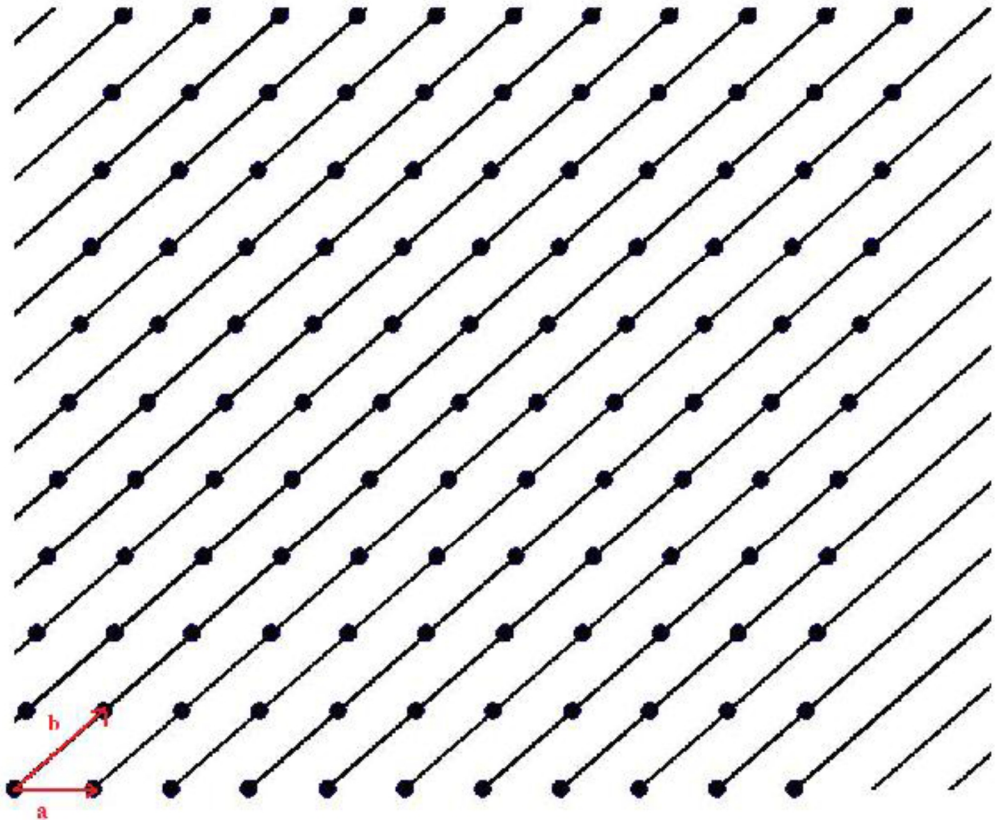

Fig. 2

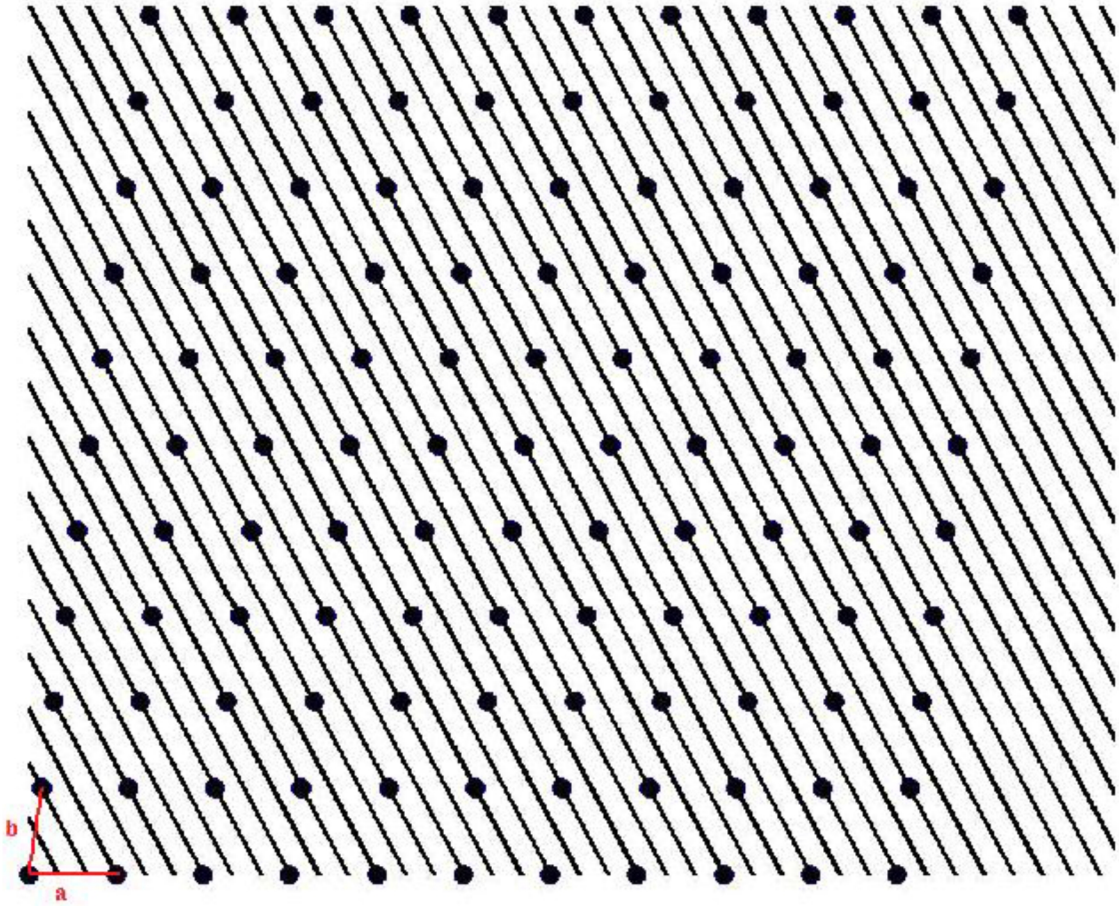

Fig. 3

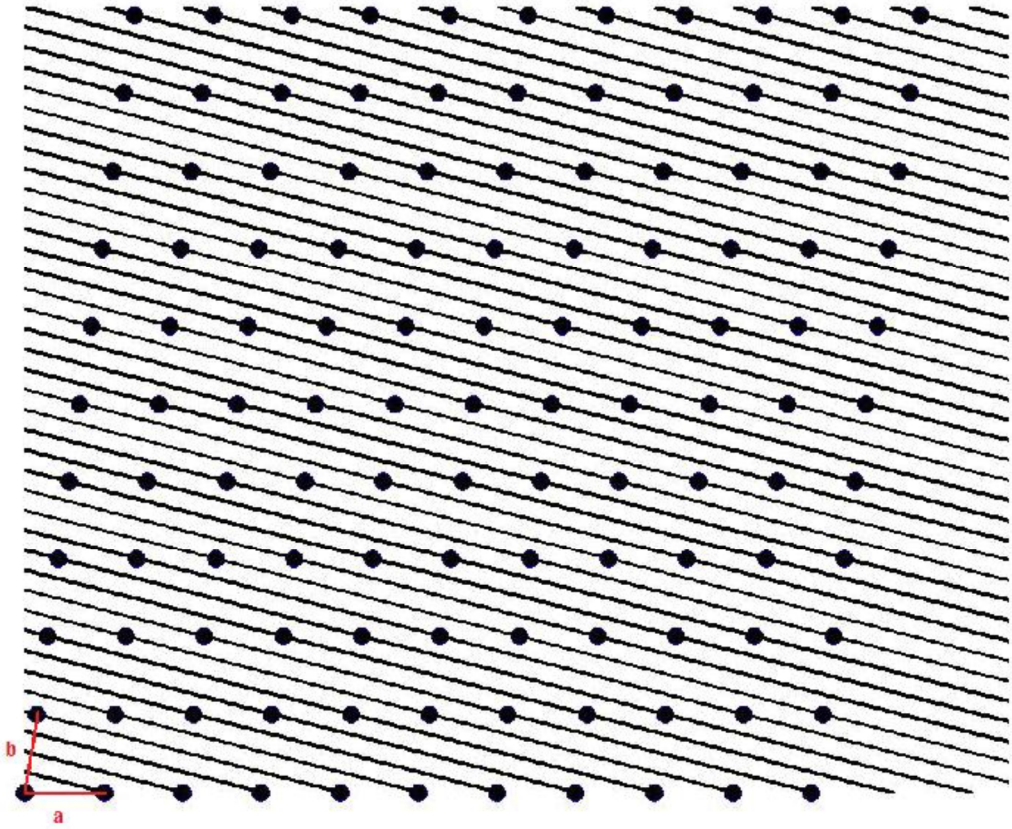

Fig. 4

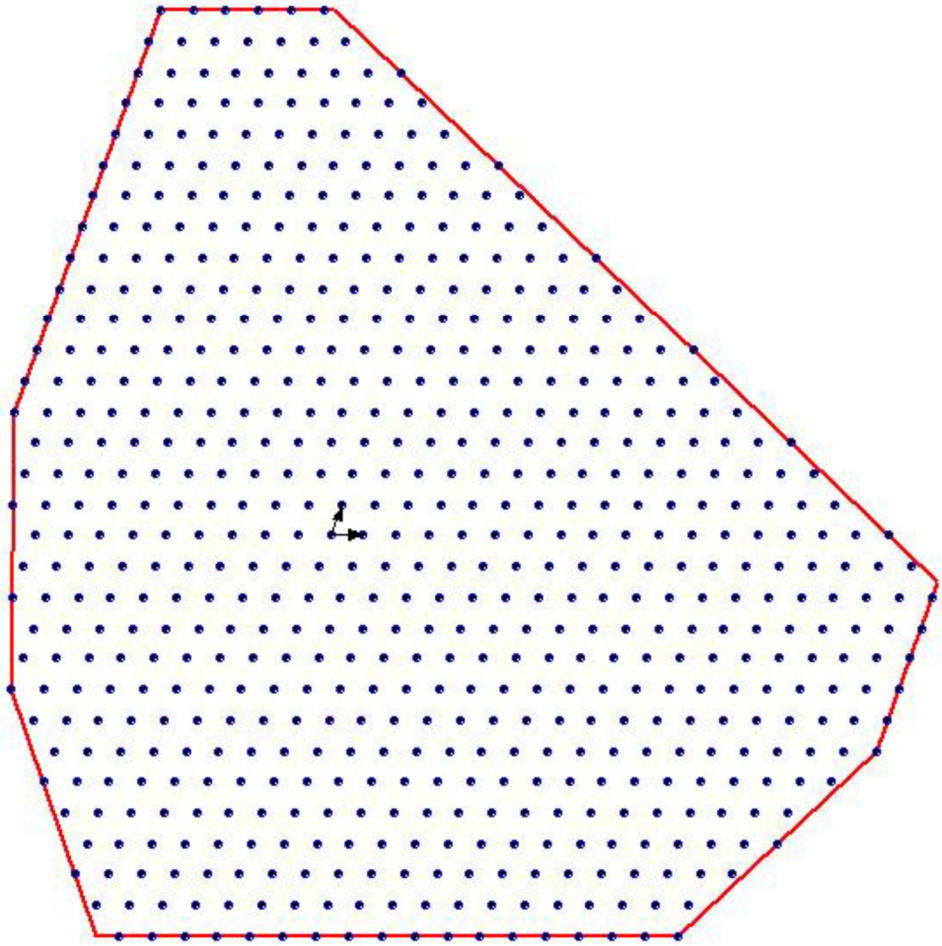

Fig. 5

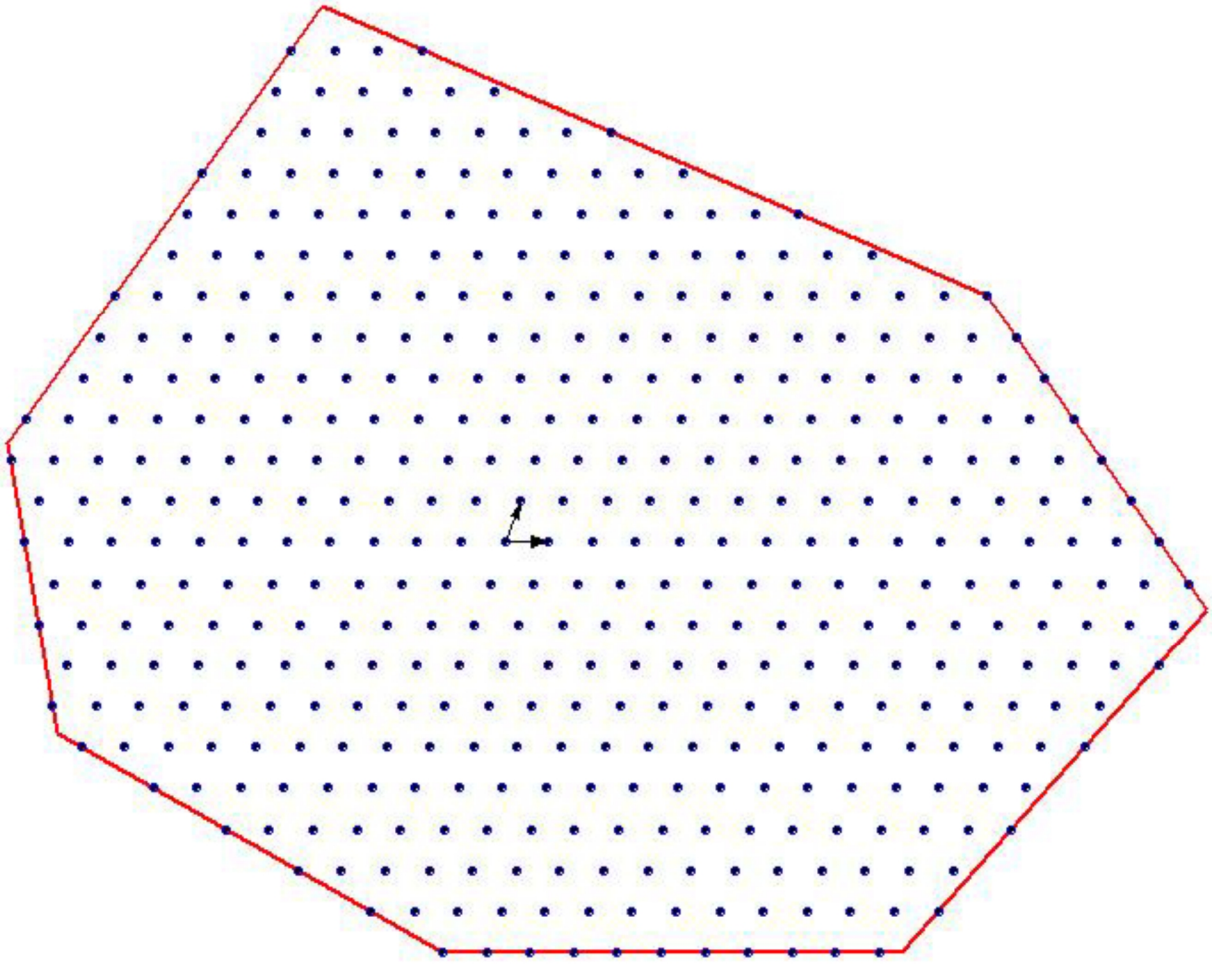

Fig. 6