

Pictures to: 3. TEM Work at Cornell University

3.1.1. TEM Investigations of Grain Boundaries in Silicon

In what follows I present the pictures used for the one and only [major publication](#) concerned with the structure of the **grain boundaries**. Besides the originals, I give some auxiliary pictures that show essentially the same structure.

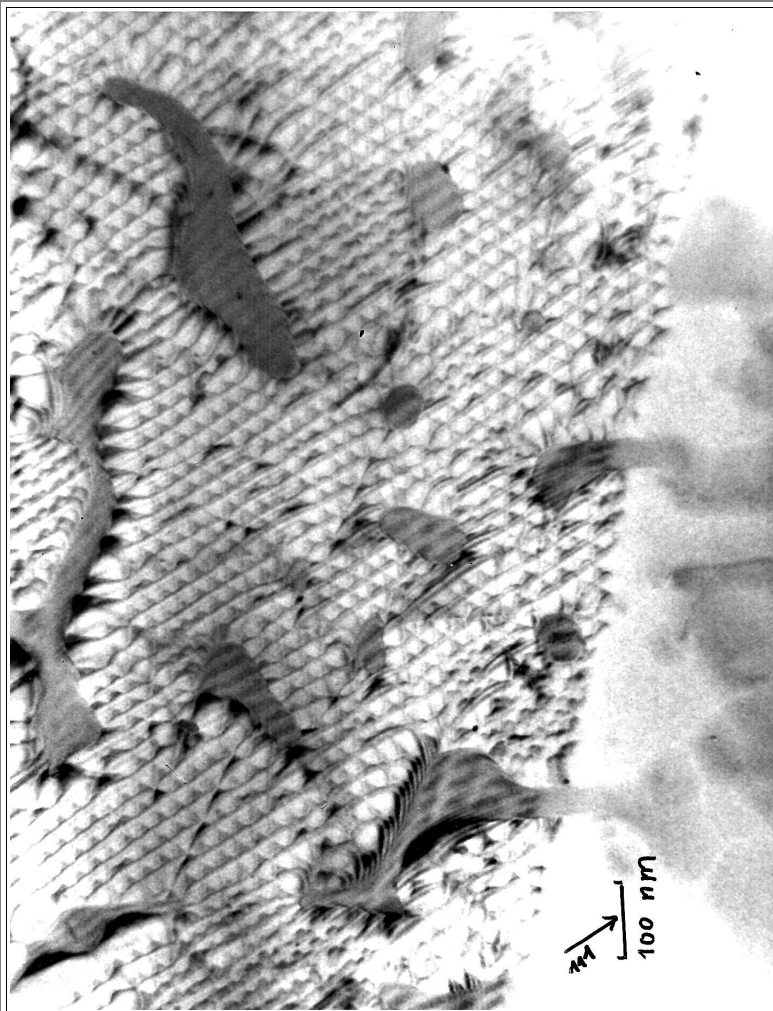
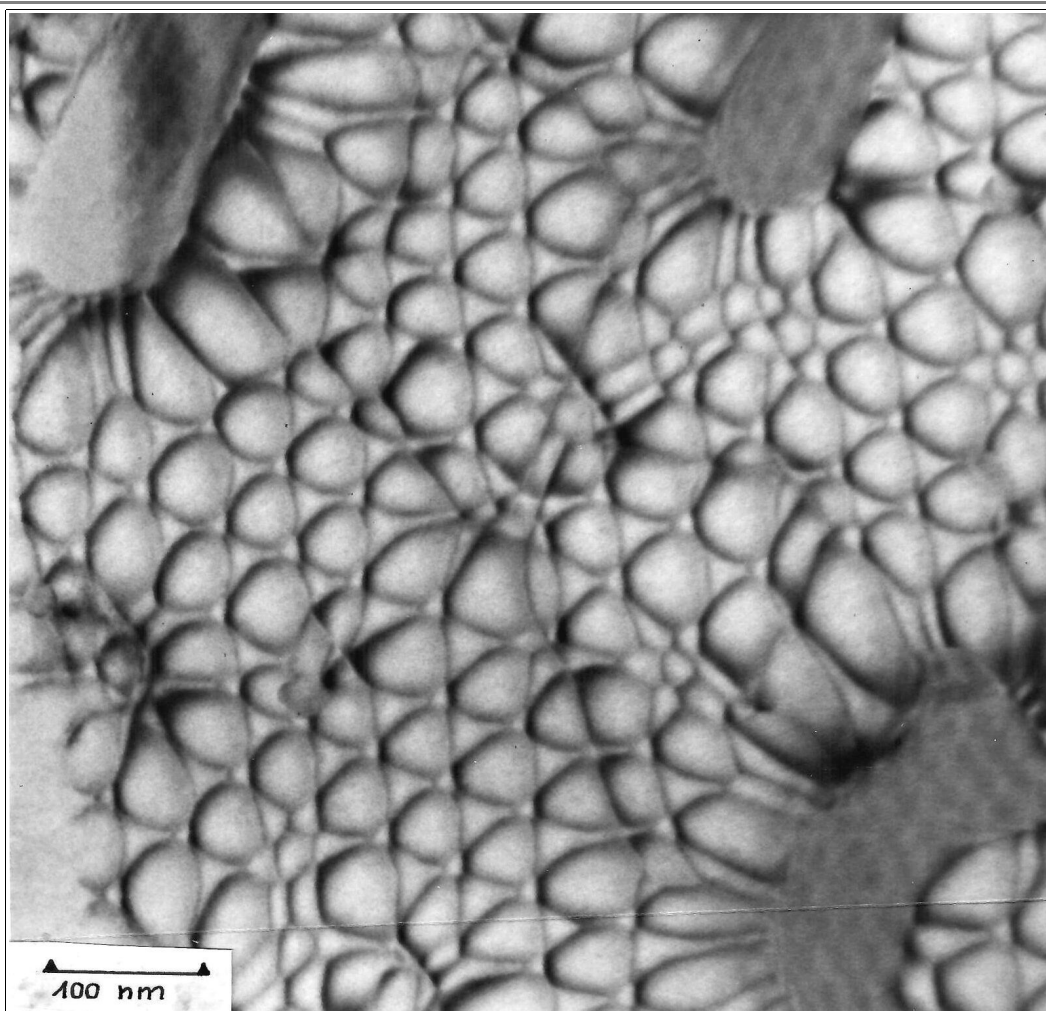


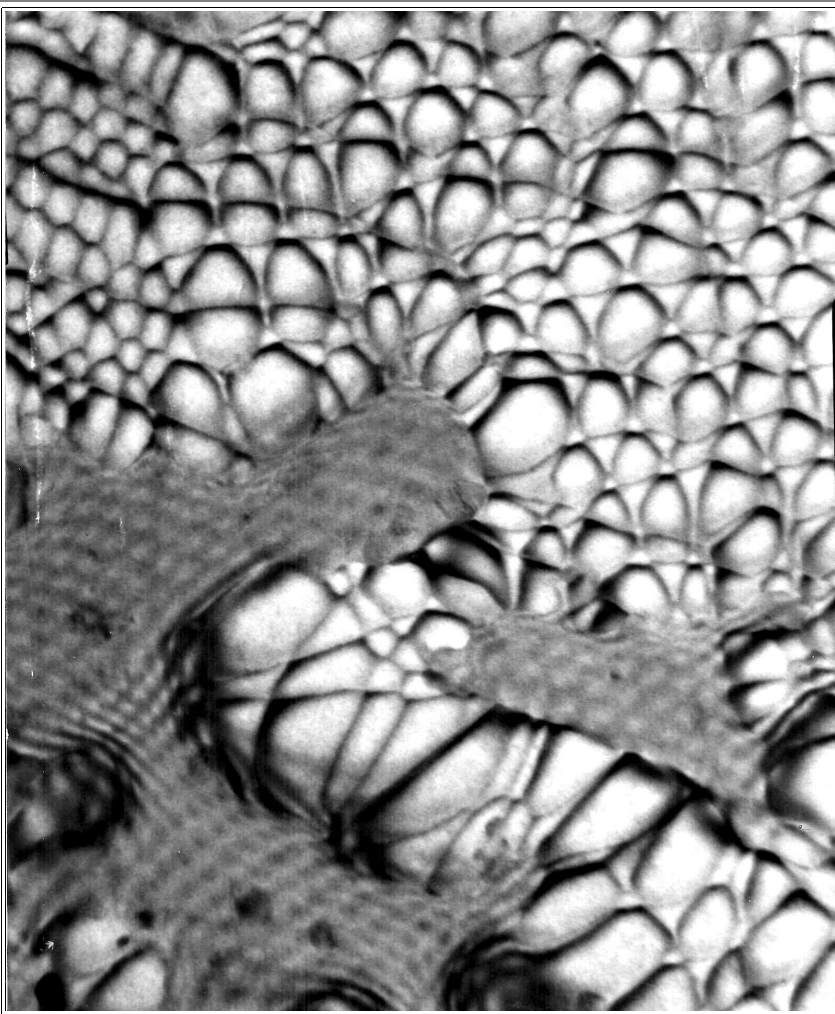
Fig. 2 in publication.

Kinematical bright-field image of a low-angle twist boundary on a (111) plane. The diffraction vector in this and the forthcoming figures is indicated by narrow; here it is $g = \{111\}$.



Auxiliary picture to Fig. 2 in publication.

Different contrast conditions show the complete network and the stacking faults in the knots



Same as above.
On the upper left the network switches to the simple hexagonal form in a twin boundary

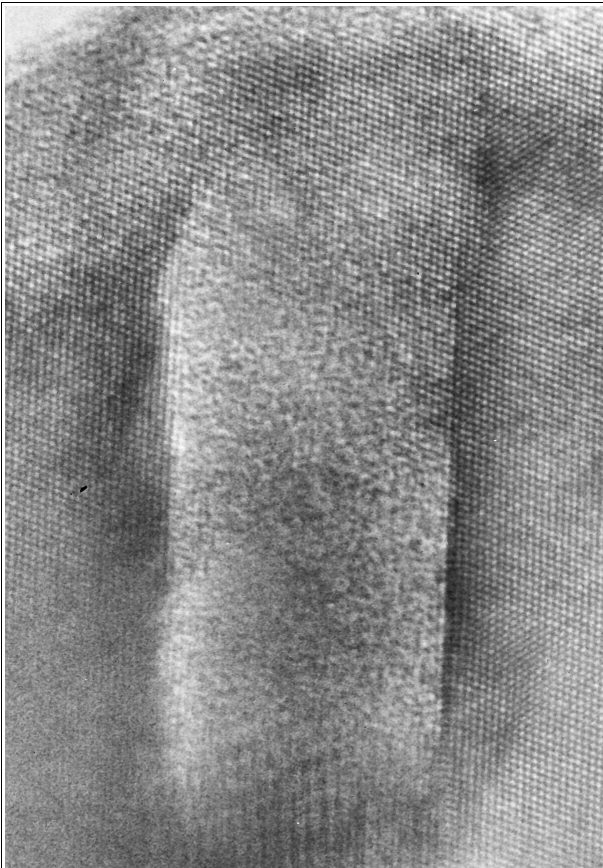


Fig. 3 in publication.

Direct lattice image of an amorphous region. White 'dots' can be thought to correspond to the open channels in a $\langle 110 \rangle$ direction; the spacing of the fringes is 0.31 nm.

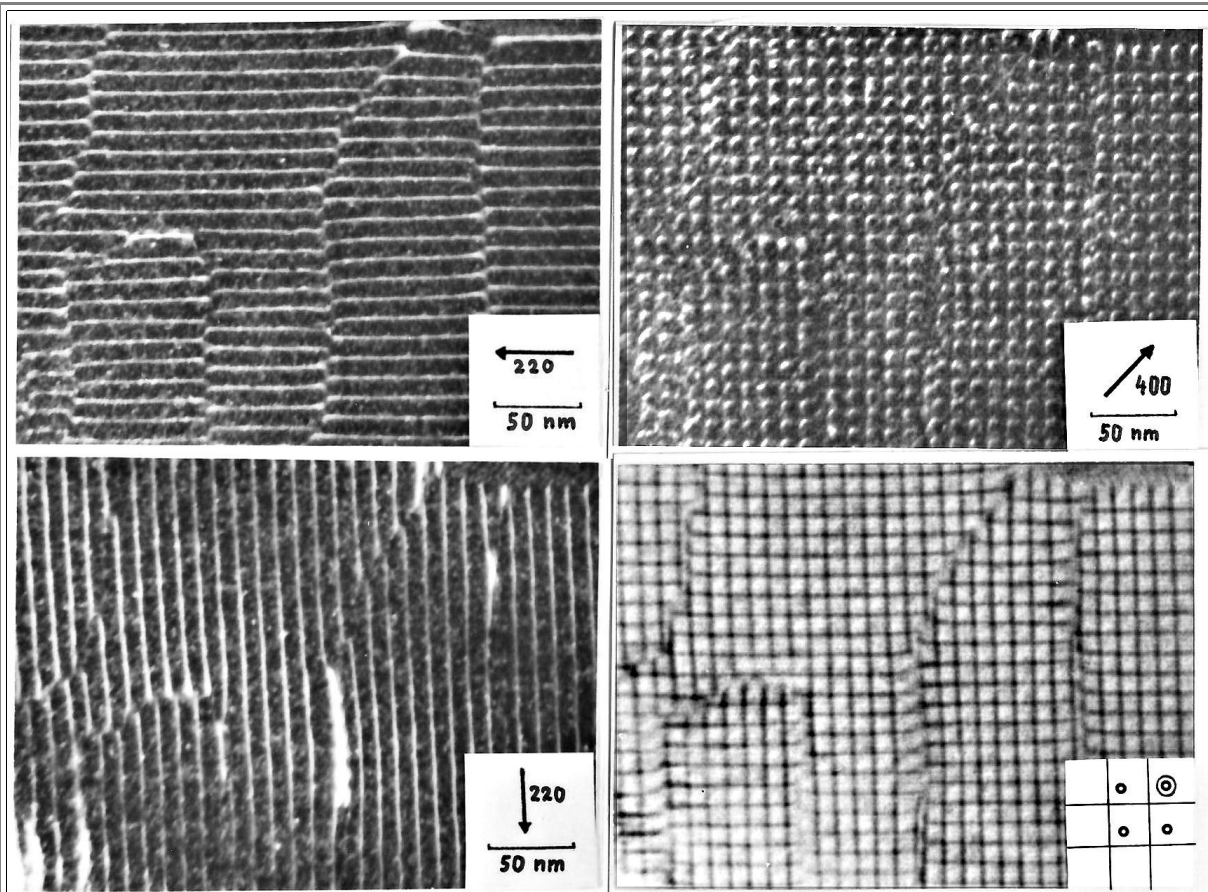


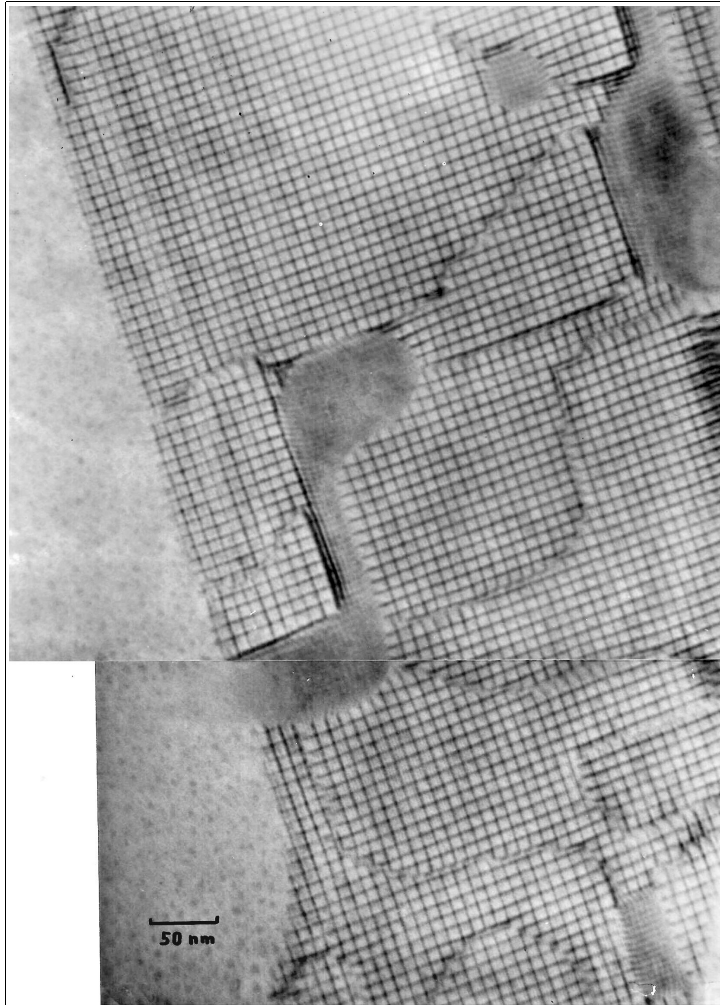
Fig. 4 in publication.

Low-angle twist boundary on a (100) plane imaged with different diffraction conditions. $g=\{220\}$ in 4 (a,c); $g=\{400\}$ in 4 (b); 4 (d) was taken with multi-beam conditions close to the (100) pole. The (220) Kikuchi bands, the major diffraction spots and the position of the aperture on the primary beam are indicated.

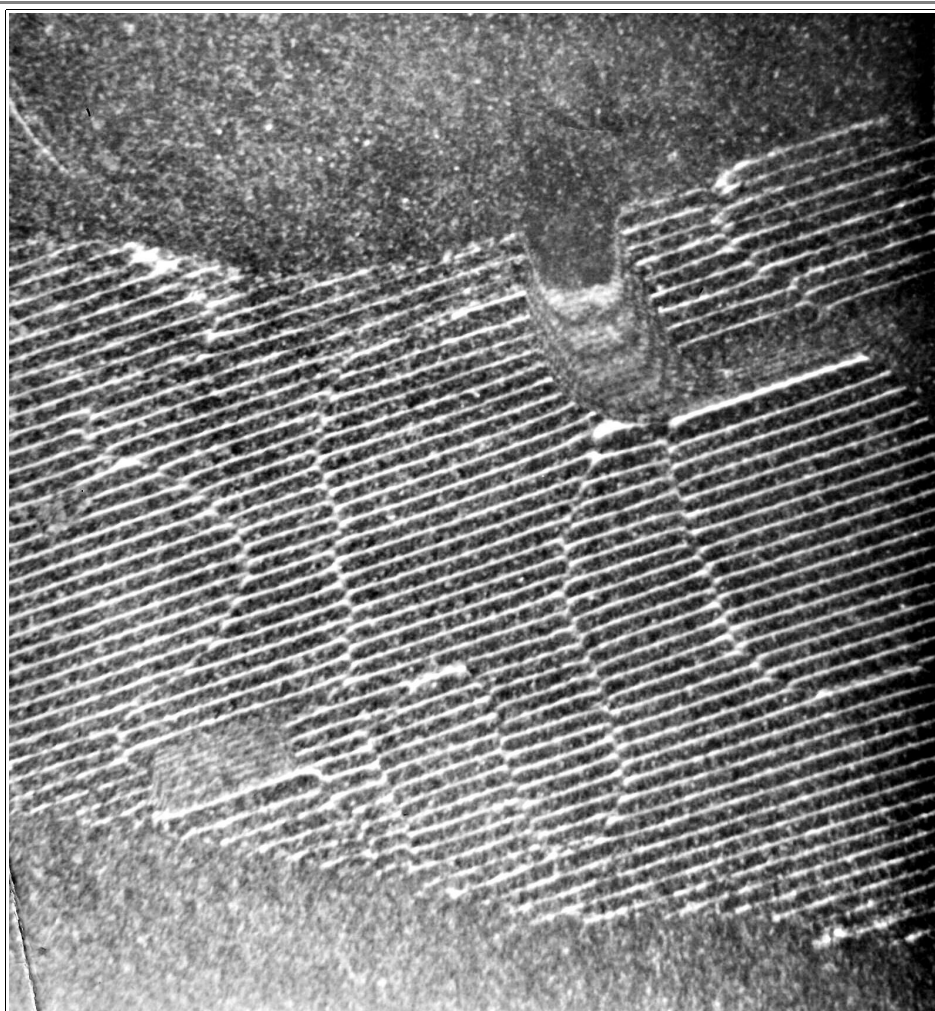


Fig. 6 in publication

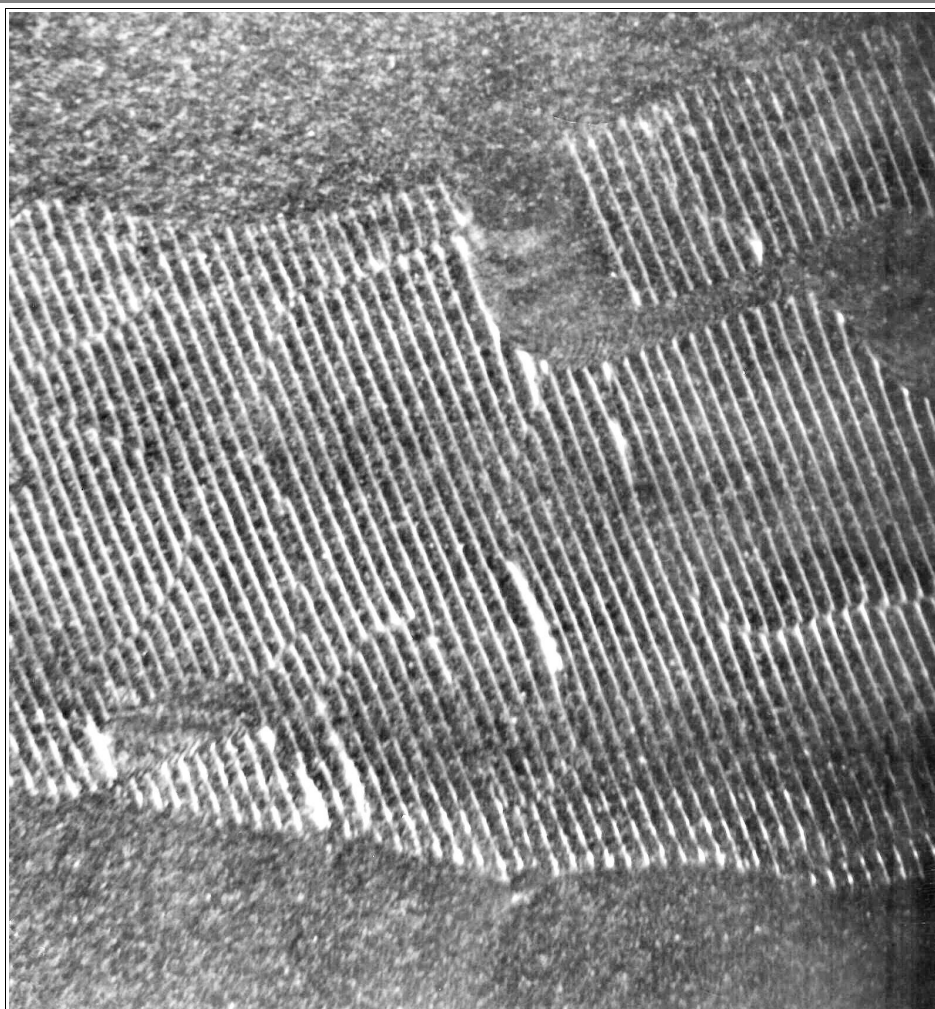
The "famous" picture showing the "text book" structure of a low-angle twist boundary on a {100 plane} with its square network of screw dislocations.

**Auxiliary picture to Fig. 6.**

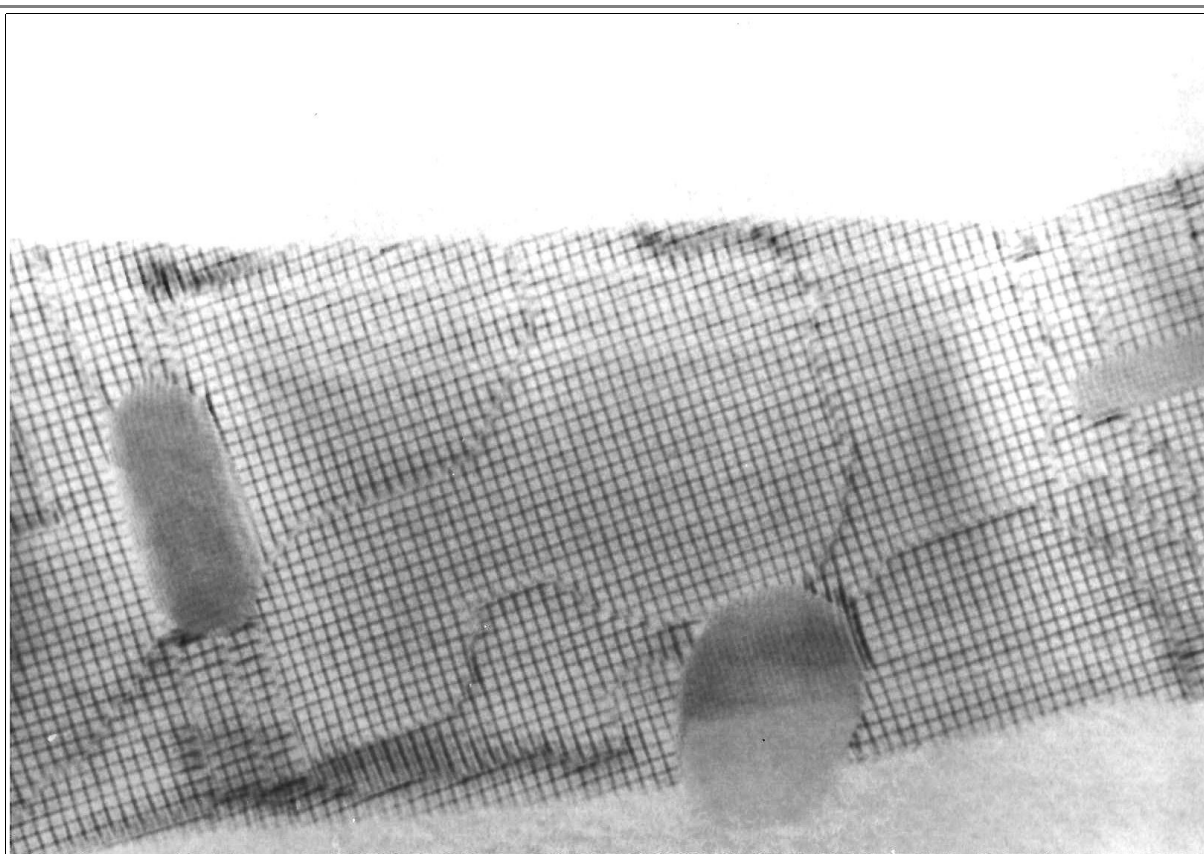
Extrinsic dislocations in the dislocation network of a low-angle twist boundary on a (100) plane.



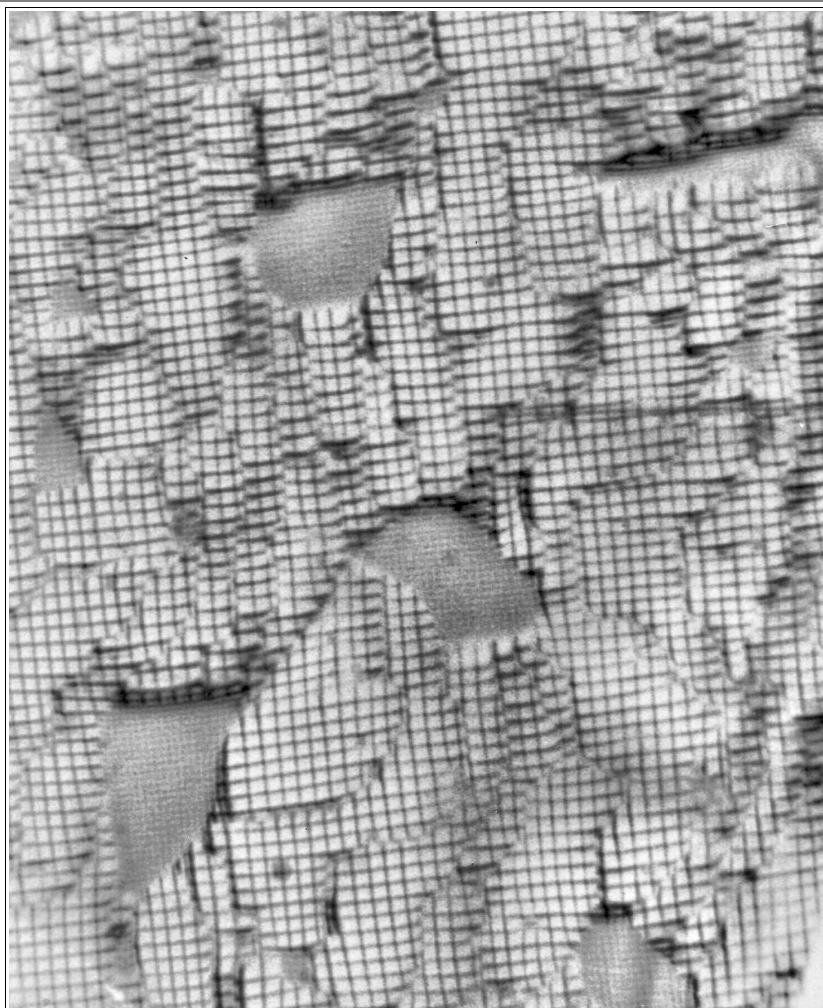
Part of the structure shown above. Weak beam, showing only one set of dislocations.



Complementary picture to the one above. Showing the other set of screw dislocations.



Similar to Fig. 6 in publication.



Similar to Fig. 6 in publication.

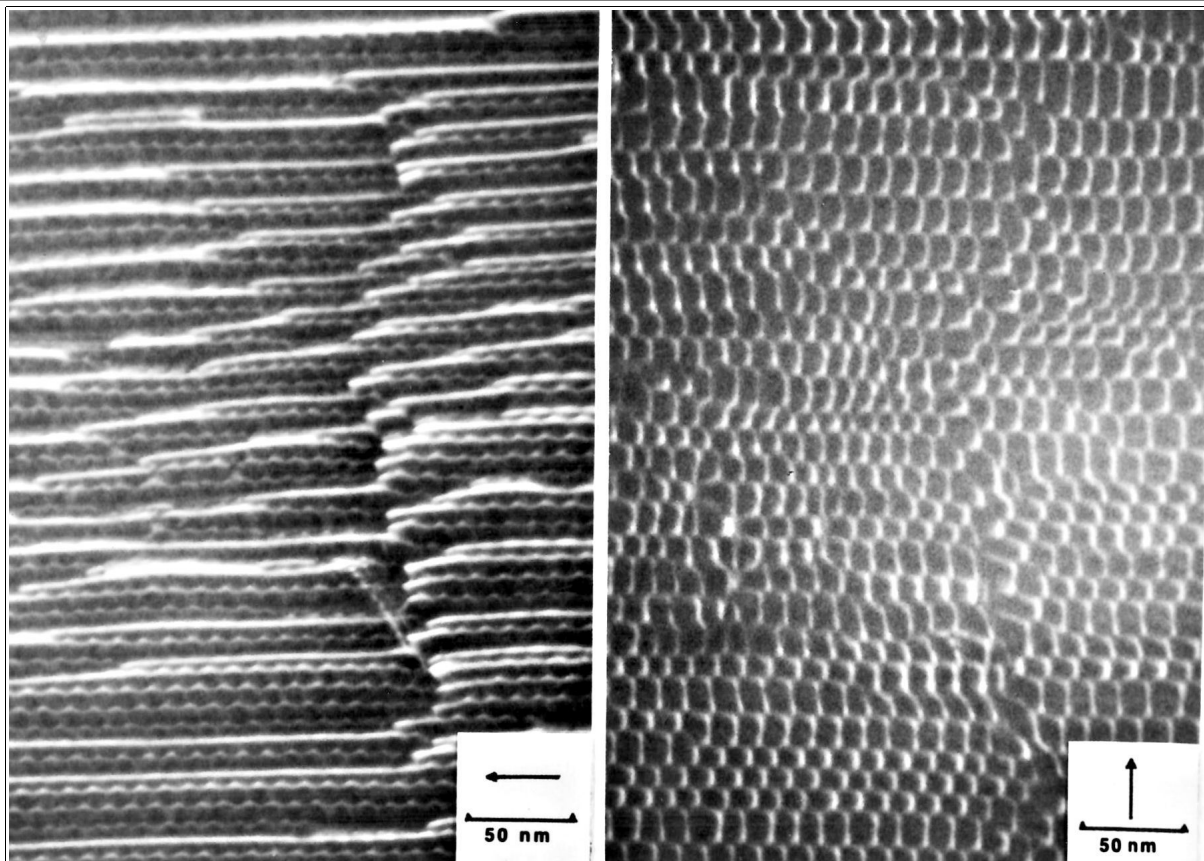
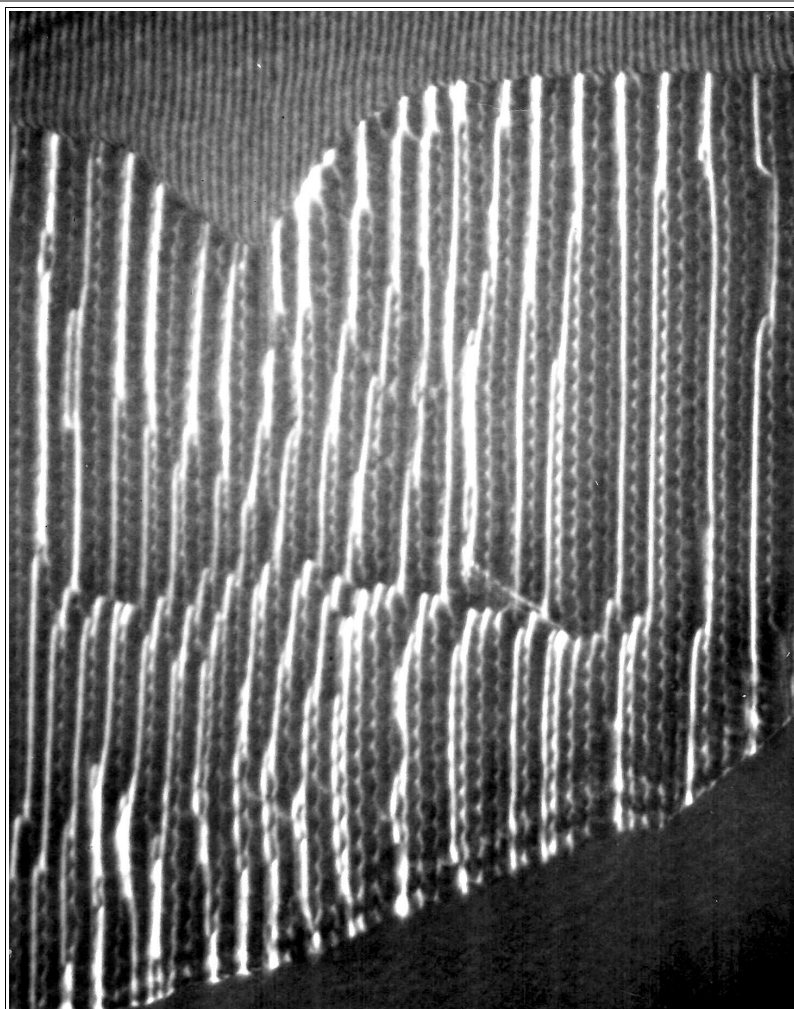
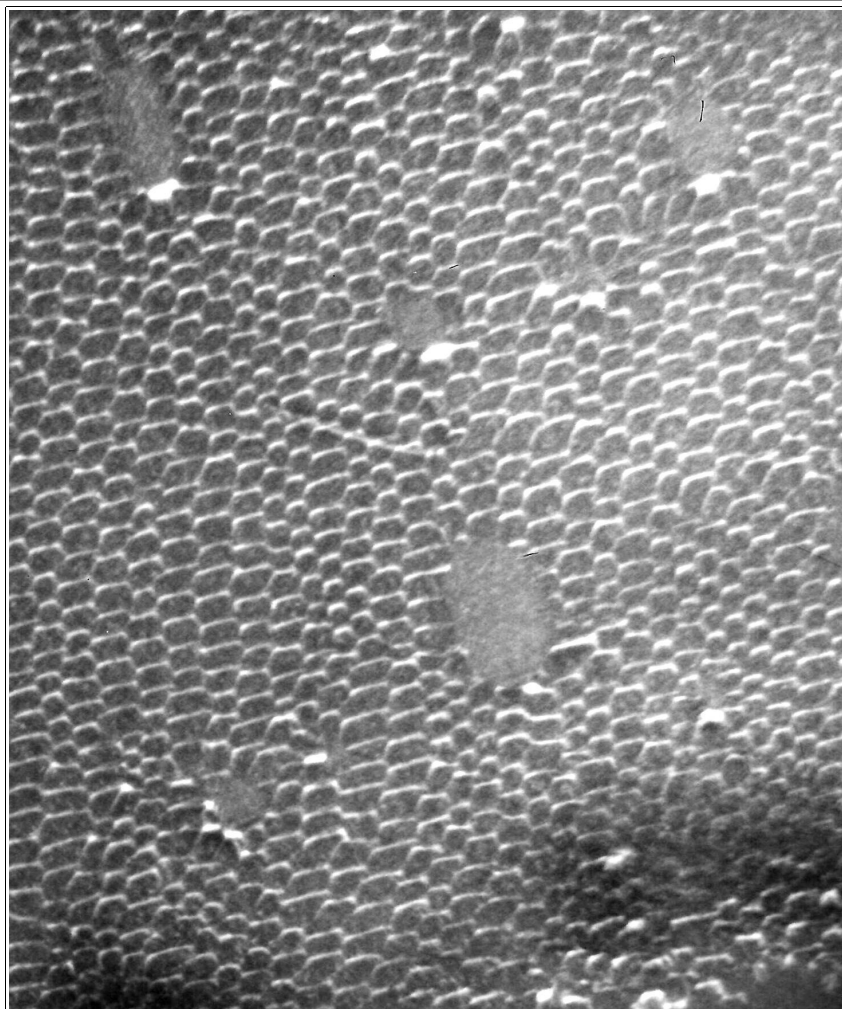


Fig. 7 in paper.



Detail of Fig. 7.



Similar to Fig. 7b).

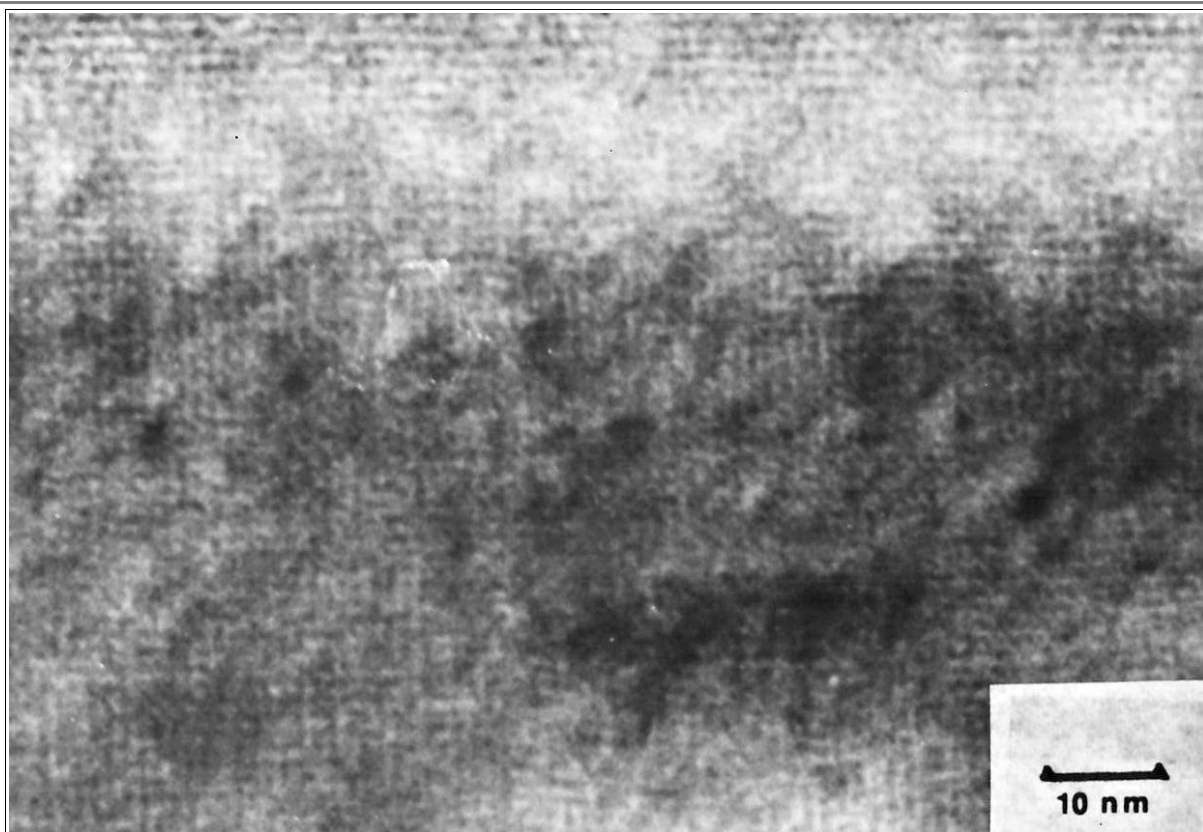


Fig. 8 in paper

Even the Philosophical Magazine, allowing rather large pictures and good print quality, could not do justice to this picture.
Here you can see the network, if just barely.

Image of a low-angle twist boundary on a (100) plane with a twist angle of $8'$ taken under multi-beam conditions.

[Link to Part 2](#)
[Link to Part 3](#)