

MICRO STM

STM measurements with the MICRO STM at room temperature. Both images show filled states of the sample at $U_{tip} = -2$ V and $I_t = 0.2$ nA. The large area scan (440 nm x 500 nm) shows Bi nanowires after deposition of 1 monolayer Bi on Si(001) at $T = 650^\circ\text{C}$. These Bi dimer rows are perpendicularly arranged with respect to the dimer rows of the Si(001) substrate. The small area scan (30 x 30 nm) shows stripes with a mean separation of 4 nm composed of Bi-dimers. The surface has also been investigated by means of SPALBED, showing both domains of the (2x1) reconstruction indicating the existence of monoatomic steps on the surface. Additional spots due to the Bi-wire superstructure can be observed.

Selfassembled quasi periodic Bi nanostructures

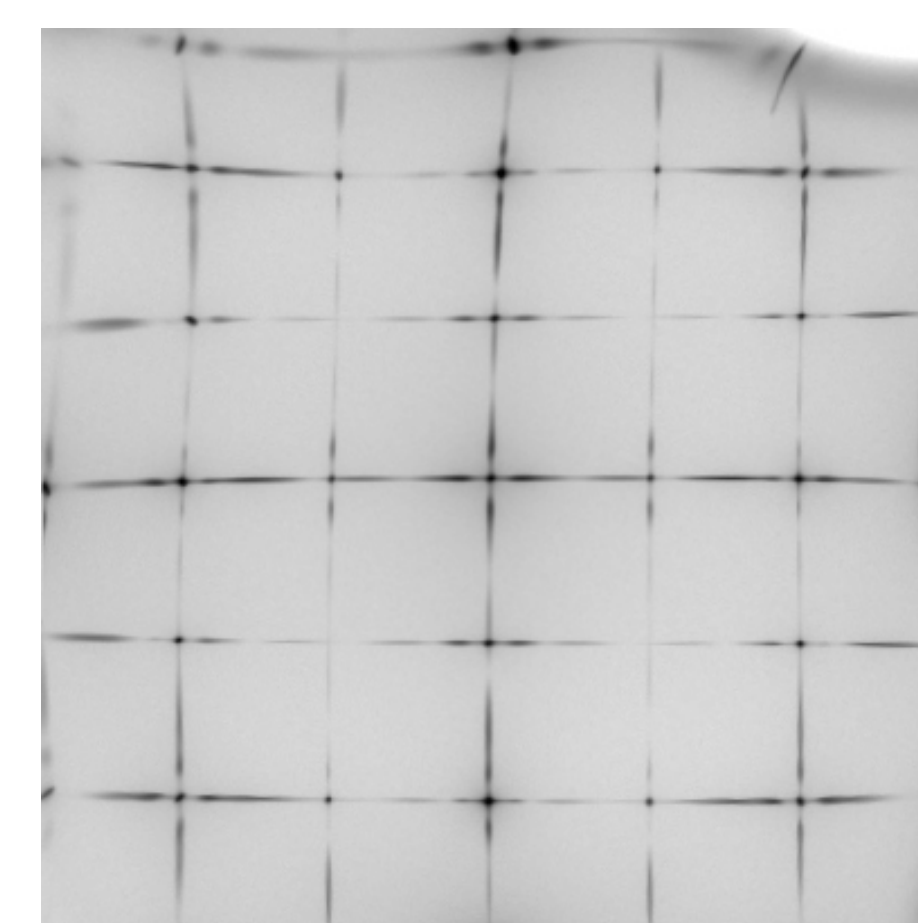
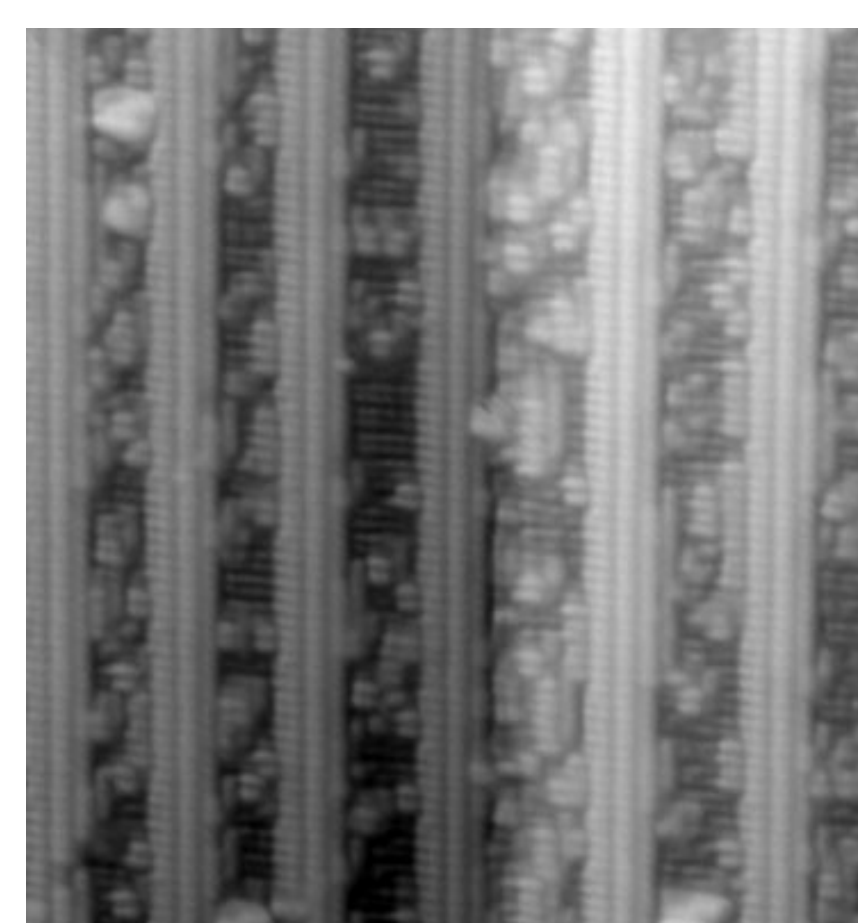
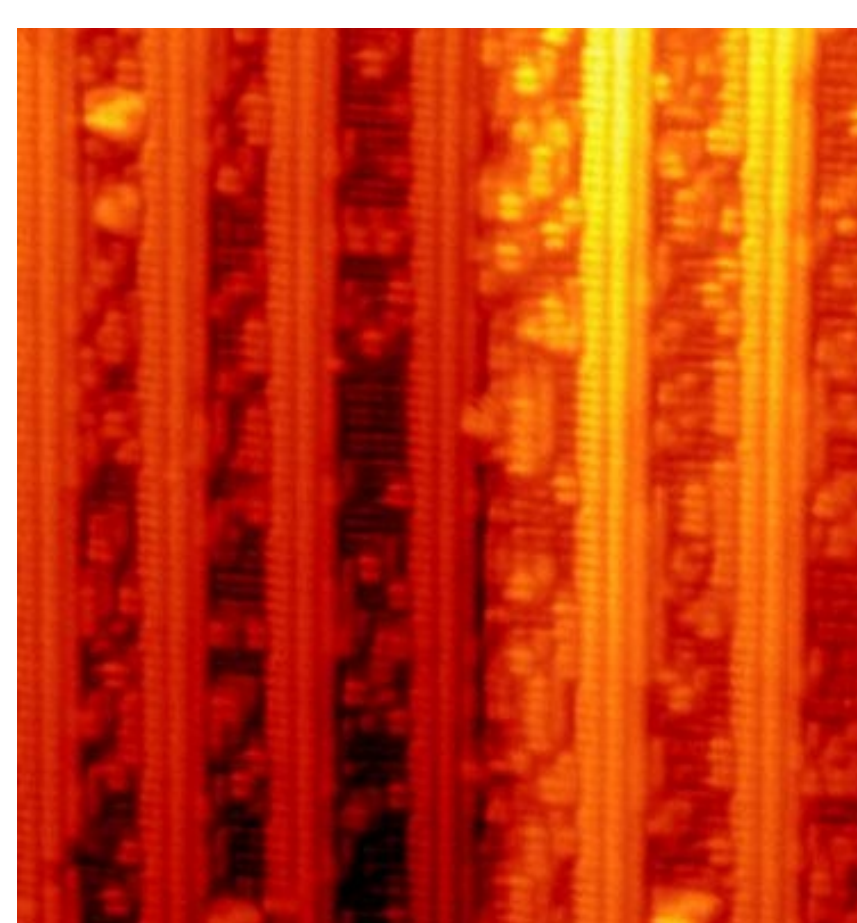
Adsorption of Bi at 650°C on slightly vicinal Si(001) substrate results in the self-assembled formation of a quasi periodic array of Bi nanostructures on Si(001). The extremely long stripes with a mean separation of 4 nm are composed of three parallel rows of Bi-dimers. The areas between the stripes show a mixture of Si- and Bi dimers rotated by 90°. The stripes nucleate at the existing step edges and propagate along a [110] direction during further adsorption. The regular arrangement is attributed to long range elastic interactions caused by adsorbate induced surface stress due to the larger covalent radius of Bi.

R. Hild, M. Horn-von Hoegen, „Selfassembled quasi periodic Bi Nanostructures“, to be published, Corresponding author: R. Hild (hild@le.physik.uni-essen.de)

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1 ML Bi on Si(001) at 650 °C

Result of the Month, March 2002, Omicron-Website



<http://www.omicron.de/pom/02month03.html>