

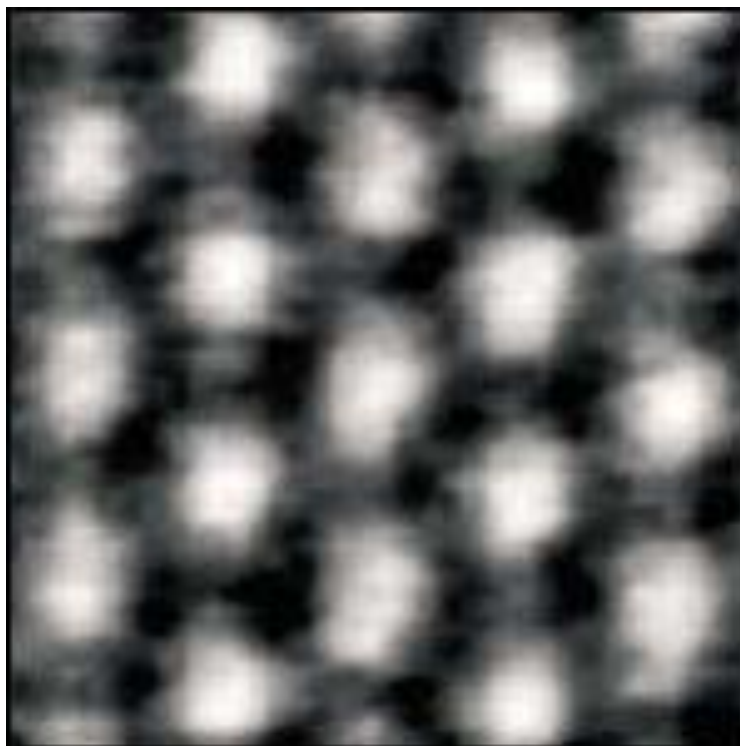


Nanoscale Images

- All the images in these slides were created using scanning tunneling microscopes (STMs) or atomic force microscopes (AFMs).
- These images are computer generated from measurements of electric current (STM) or electrostatic forces (AFM) between the sample and the microscope tip.
- These are NOT optical images. Atoms CANNOT be seen with visible light.
- Also, the colors are computer generated to make the images more appealing.



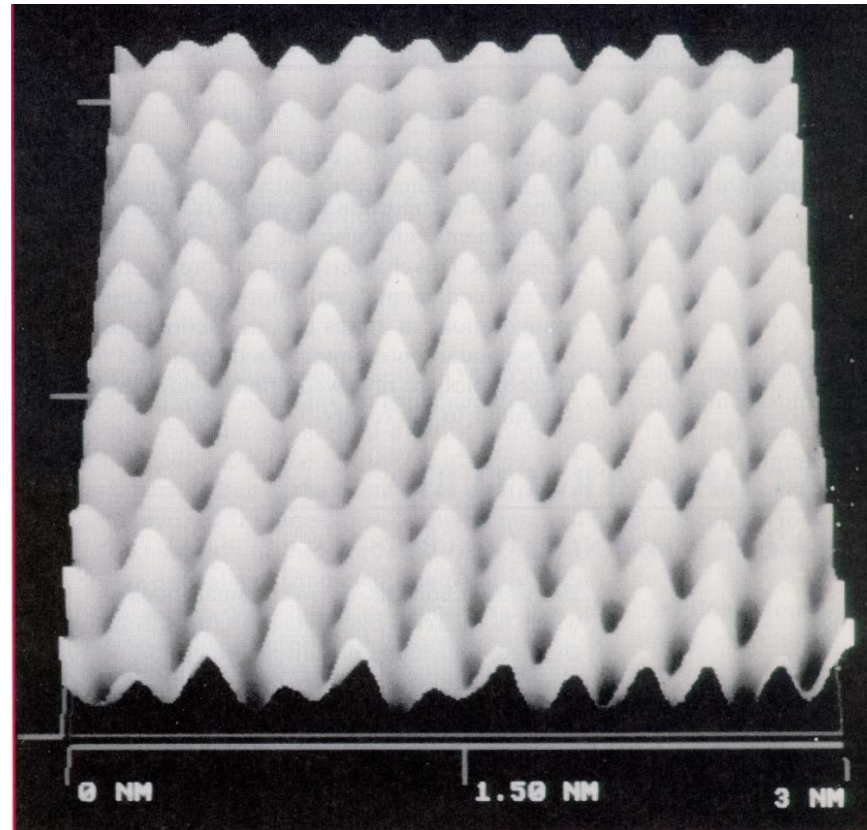
Images of Atoms



Carbon atoms. Image is 1 nanometer wide.



Images of Atoms

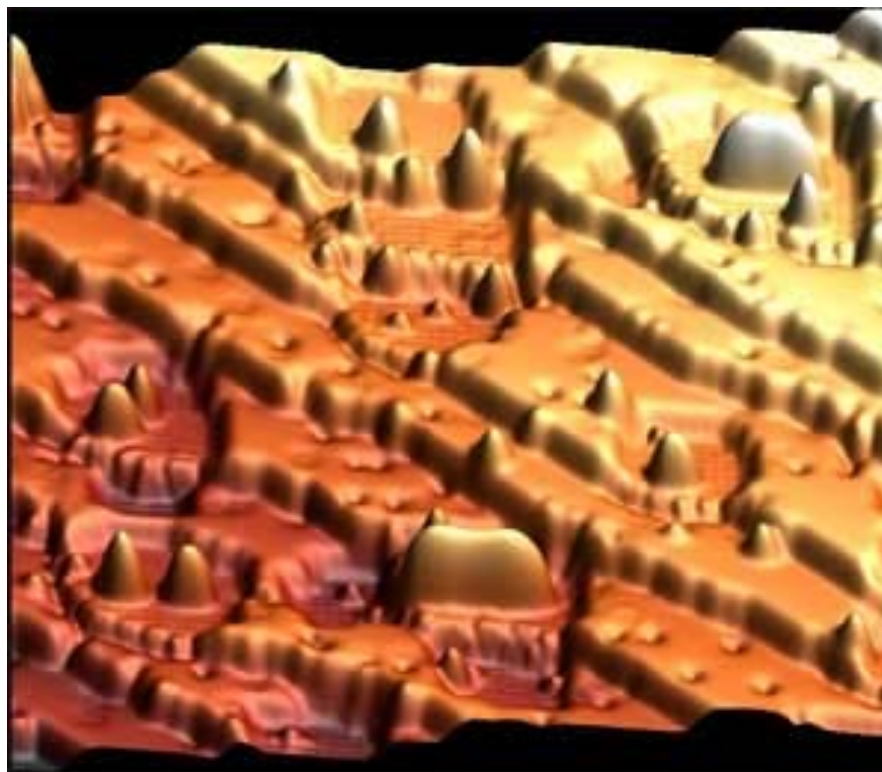


Gold atoms.

Image from Dr. Michael Green, TopoMetrix Corporation.



Images of Atoms

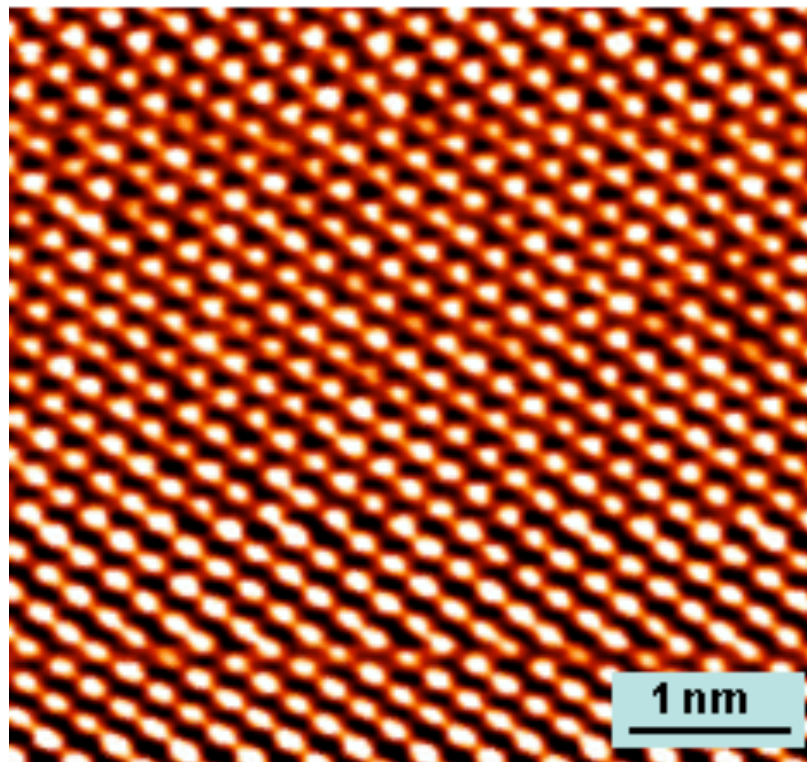


Manganese atoms on terraced copper and copper nitride.
Image is 28 nm wide.

Image originally created by IBM Corporation.



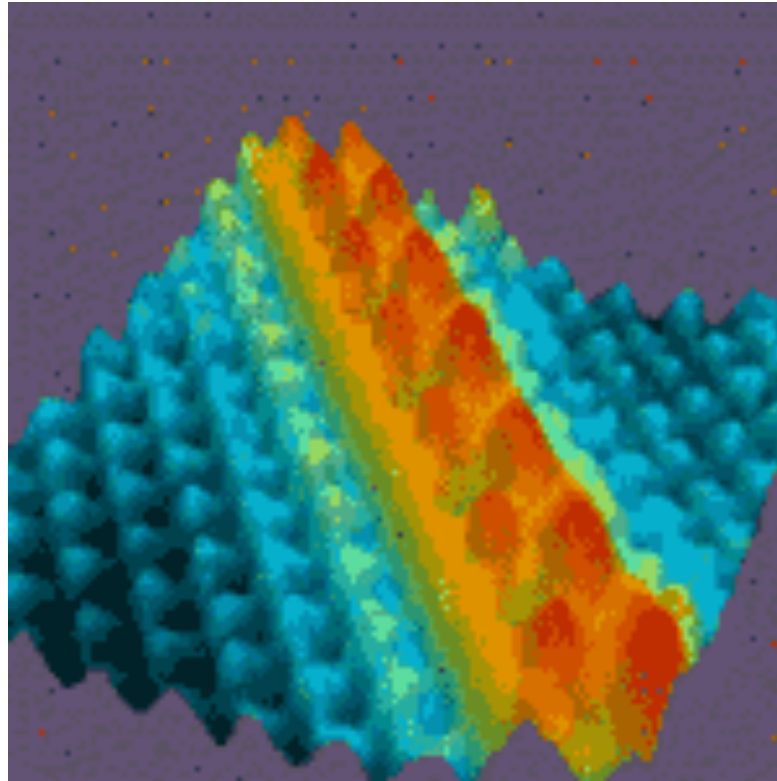
Images of Atoms



Carbon atoms in graphite (pencil lead).



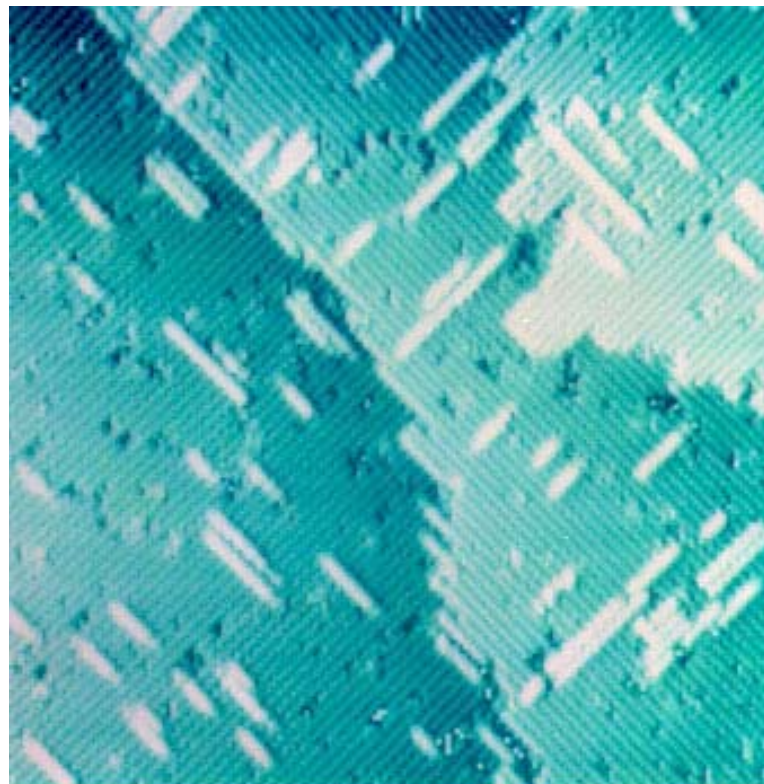
Images of Atoms



Cesium atoms on gallium arsenide.



Images of Crystals

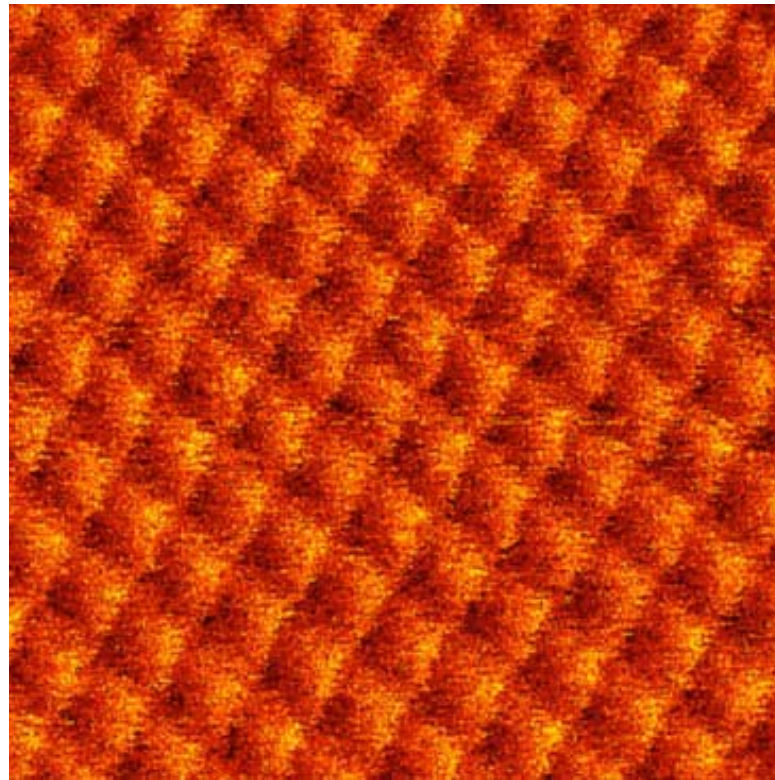


Layers of silicon atoms in a crystal structure.

Image: Prof. Max Lagally, University of Wisconsin - Madison



Images of Crystals

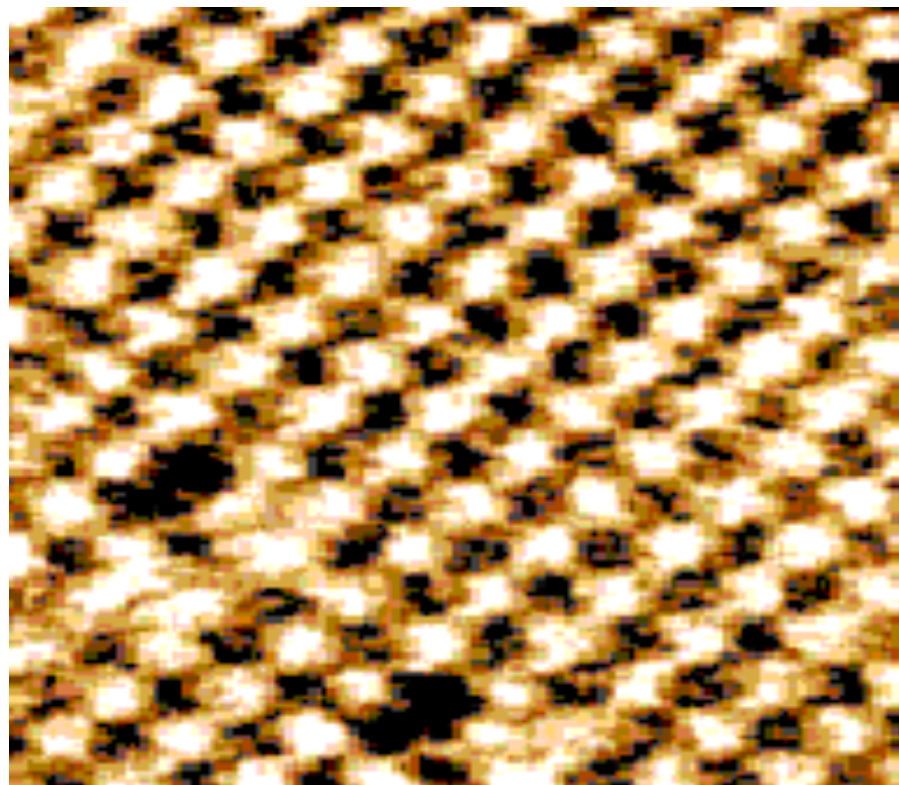


Sodium chloride (NaCl) crystal structure.

Image created by R. Carpick and R. Cannara, Univ of Wisconsin-Madison
and Z. Wang, RHK Technology



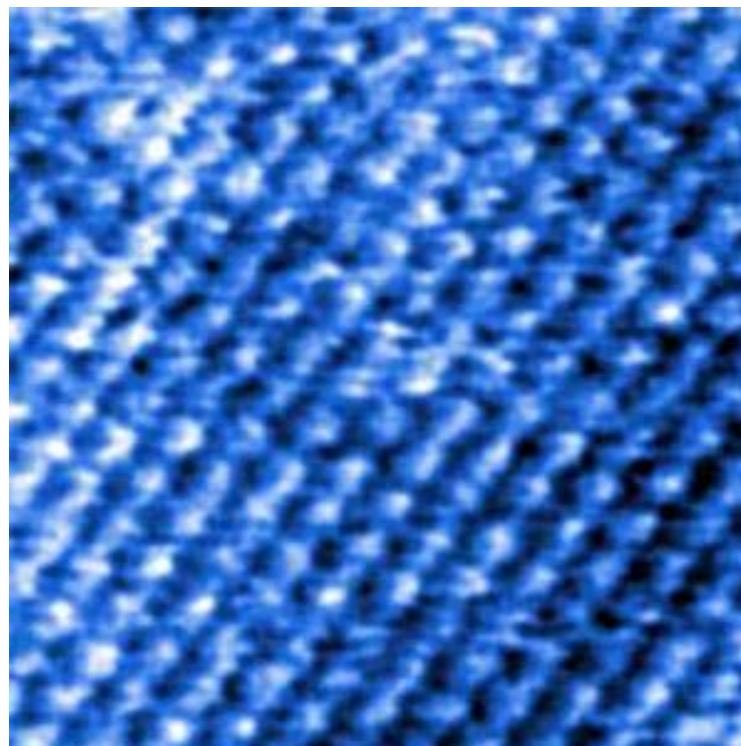
Images of Crystals



Sodium chloride (NaCl) crystal structure.



Images of Crystals

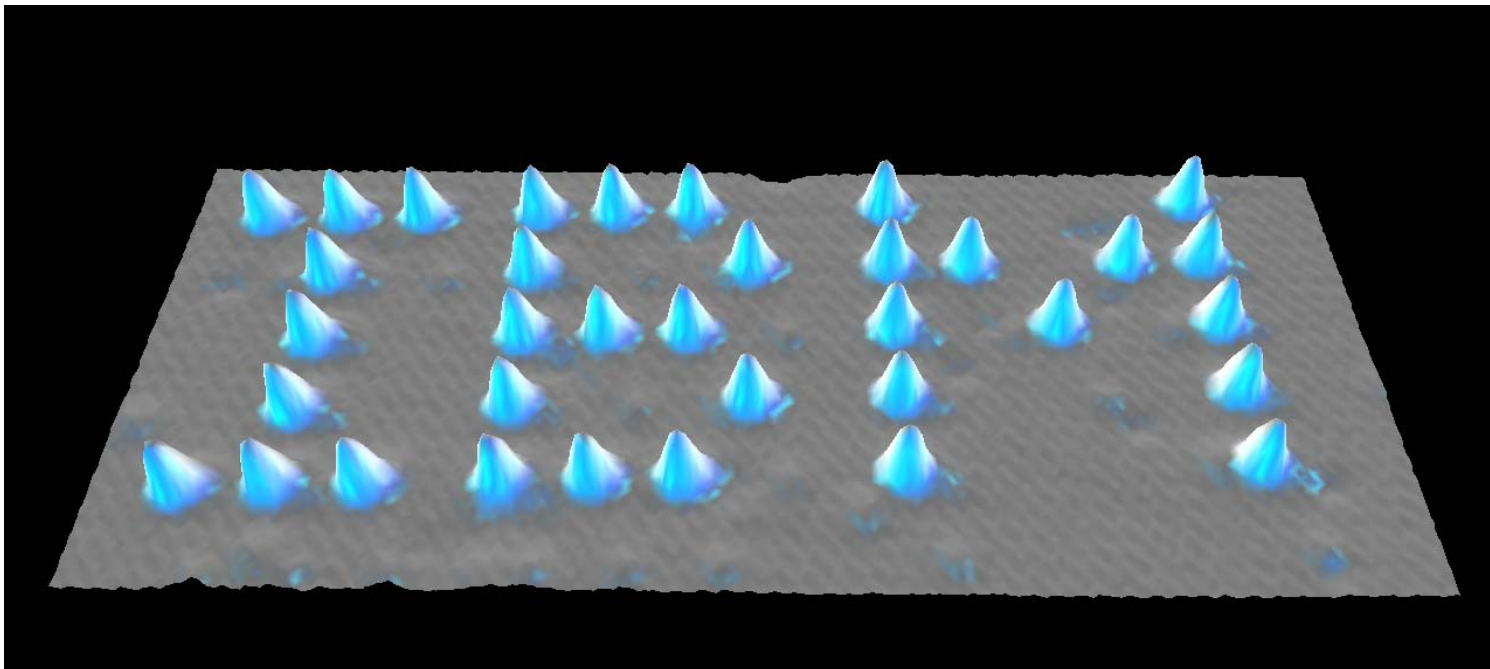


Sodium chloride (NaCl) crystal structure.
Image is 3.9 nm wide.

Image created by Dr. H.J. Hug, B. Stiefel, A. Moser, P.J.A. van Schendel, O. Knauff, S. Martin and H.-J. Güntherodt; University of Basel



Images of Atoms

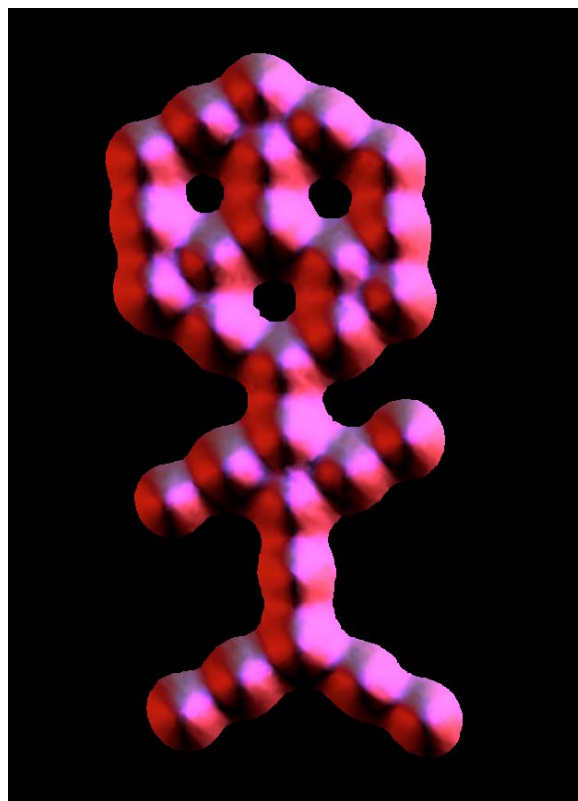


Xenon atoms on nickel.

Image originally created by IBM Corporation.



Images of Atoms

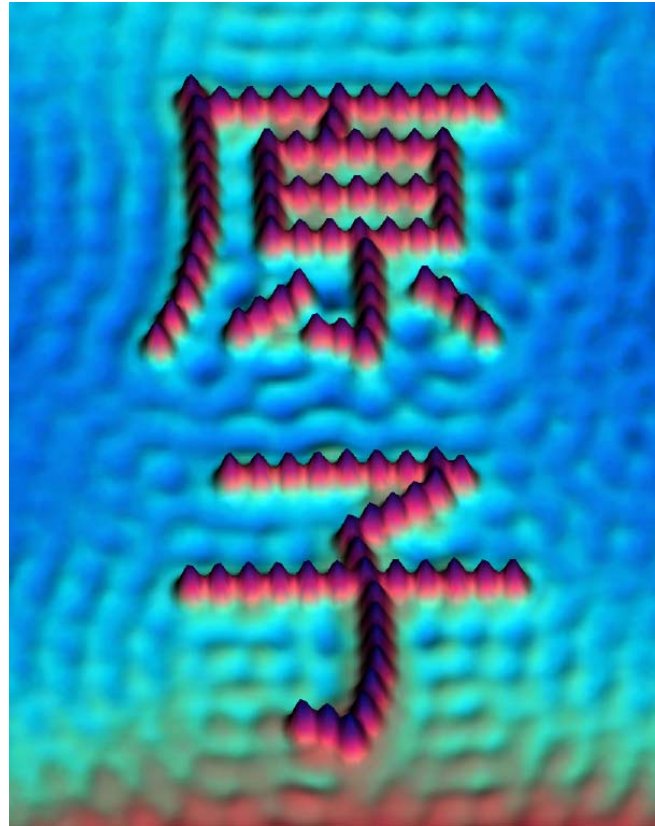


Carbon monoxide molecules on platinum.

Image originally created by IBM Corporation.



Images of Atoms



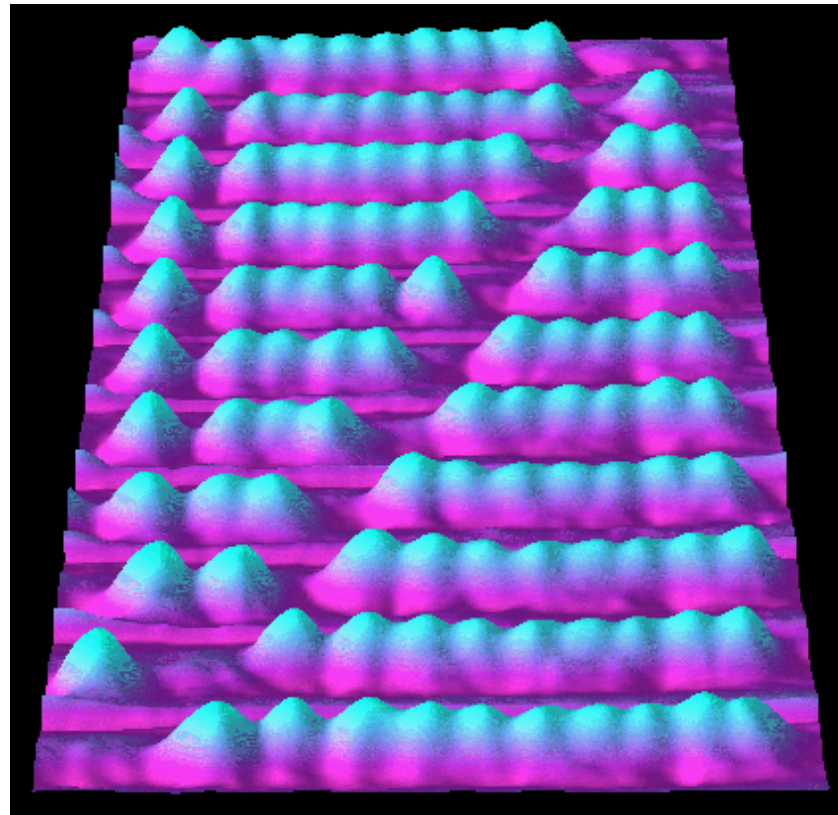
Iron atoms on copper.

The Kanji characters for “atom” (literally: “original child”).

Image originally created by IBM Corporation.



Images of Atoms



Carbon “buckyballs” on a carbon surface.
The buckyballs were moved back and forth like the beads on an abacus.
(Click on the image for a movies of the abacus in action.)
Image originally created by IBM Corporation.