Nanotechnology - science or fiction?

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This presentation can be treated as a brief introduction to Nanotechnology and Nanoscience bearing in mind evolution of these terms over years - Feynman, Taniguchi, Drexler. We will introduce basic ideas of Nanotechnology like bottom-up *versus* top-down philosophy, assemblers, replicators, nanomachines, cyborgs *etc*. We also focus on Nanotechnology as a interdisciplinary science. Finally critics of Nanotechnology from physical and chemical points of view will be presented leading to hardcore and pragmatic definitions of Nanotechnology and Nanoscience.

The second part of the presentation stands on the pragmatic definition of Nanotechnology. The basic obstacles to further miniaturization of conventional semiconductors devices and application of 0-D, 1-D and 2-D semiconductor quantum devices in electronics will be addressed. After that we will show basic principles of operation of molecular electronics devices based on carbon nanotubes and self-assembled molecules. In this part our scanning tunnelling microscopy and spectroscopy results on carbon nanotubes, encapsulated carbon nanotubes, SiC wires, self-assembled molecules, derivative aducts to C_{60} molecules and nanoindentation of TiO_2(110)/(100)/(001) surfaces will be presented and discussed.

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