

Nanoparticles based Nanotechnology

by

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The content of my lecture, entitled “Nanoparticles based Nanotechnology”, is a result of my recent research and educational activities concerning the molecular behavior of condensed matter in small systems. It contains a special viewpoint of nanosystems based on my prior experiences dealing with the study of matter, especially the magnetic, optic and electronic properties of these nanomaterials. Nanomaterials are a field which takes a material-science based approach to nanotechnology. I will start with a short overview of treatments employing nanotechnology with special emphasis on the history and early milestones and continue by speaking about the fundamentals of nanotechnology directed at freshmen or the general public. This will include insights on the scaling laws which give information about the physical ramifications of miniaturization, as well as the specific fundamental differences between macro scale and nanoscale phenomena. The specific material properties of nanoobjects, such as metals, semiconductors, magnetic and carbon based materials will be discussed with examples of their applications in electronics and biomedicine.

