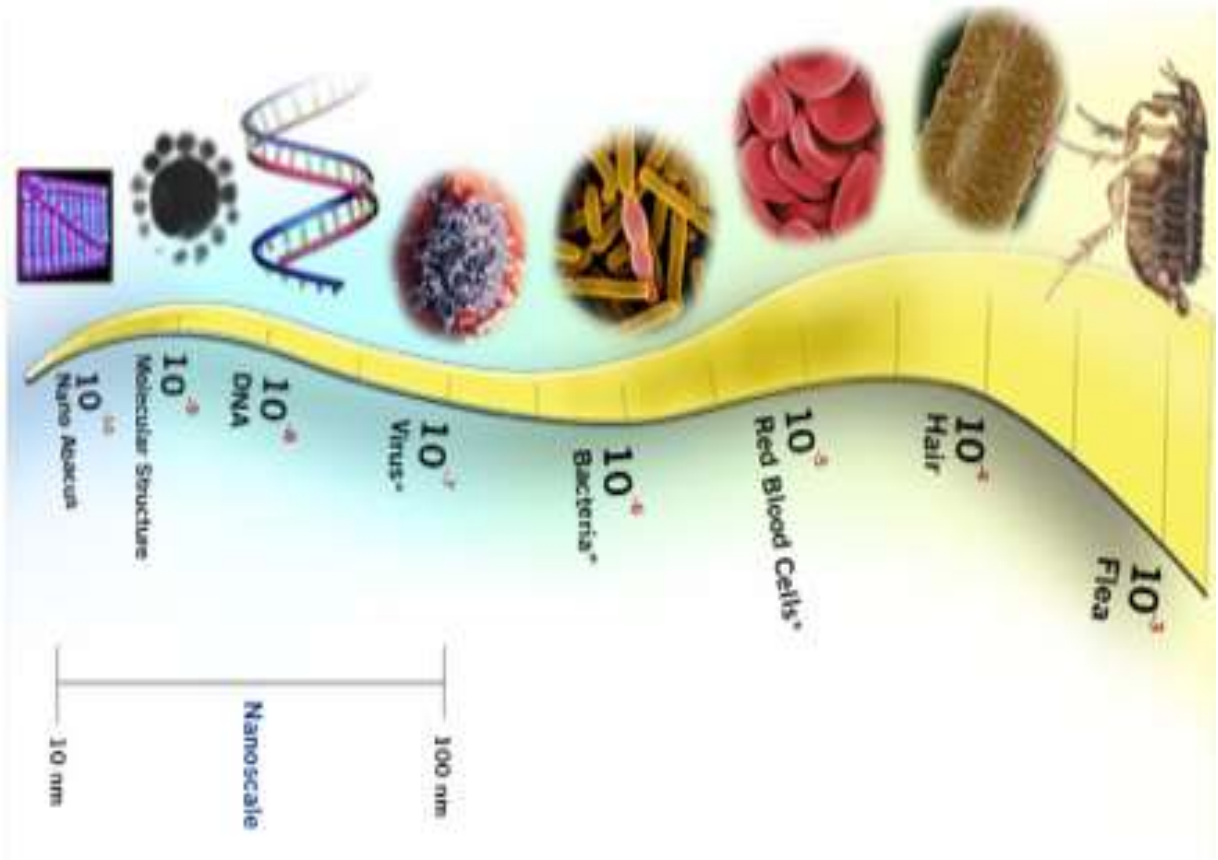


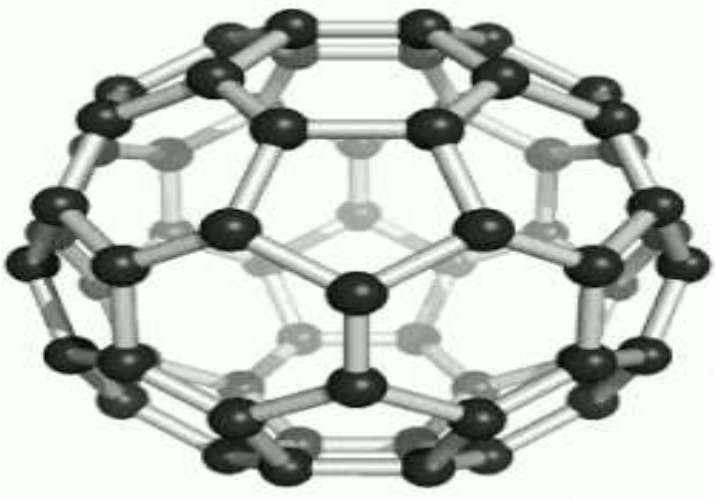
Milestones in Nanotechnology.

—1951 • E. Müller developed the Field Ion Microscope which enabled the imaging of atoms from the tip of metallic samples.

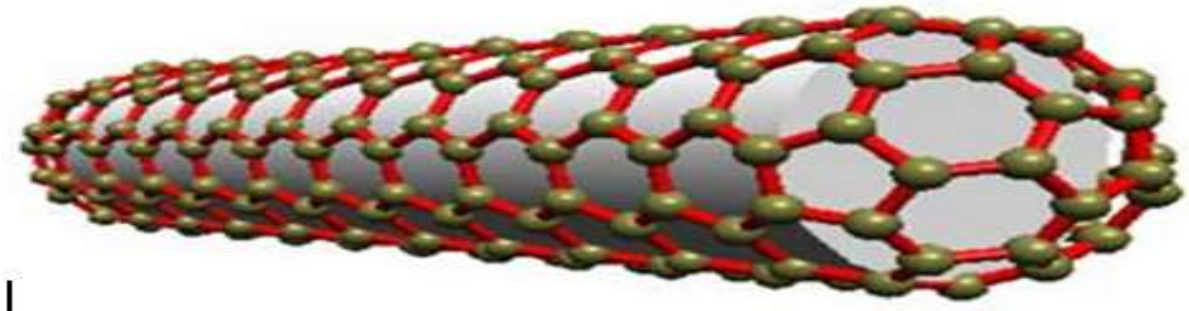
—1959 • R. Feynman delivered his famous "There's Plenty of Room at the Bottom" lecture, stating that reducing the dimensions of materials would produce amazing materials. This groundbreaking lecture envisioned the possibility of manipulating matter at the atomic and molecular levels, inspiring the field of nanotechnology.



—1970 • L. Esaki demonstrated the quantum size effect (QSE) in semiconductors.
__ 1980 • A.I. Akimov showed Q.S.E in Cd and CdSe particles dispersed in glass , triggering there search on nanoparticles.
___1981 • G. Binnig and H. Rohrer developed the scanning tunneling microscope (STM) by which atomic resolution could be obtained . This was also followed by a family of scanning probe micro scopes of various types.
—1985 • R.F. Curl , H.W. Krotoand R.F. Smalle ysynthesized sixty atom Carbon molecule , laternamedas ‘Fullerene.’
Fullerenes: are a class of carbon allotropes in the form of spherical cage molecules with carbon atoms positioned at the corner of a polyhedral structure composed of pentagons and hexagons. One carbon atom is located at each corner of the 20 hexagons and 12 pentagons that form the surface of the sphere.



—1991 •S. Iijima discovered ‘carbon nanotubes’ (Carbon Nanotube (CNT) is single-layer graphene rolled into a tube, The single-wall Carbon) dealing with very small dimension materials usually in the range of (1–100 nm) .



When at least one of the dimensions of any type of material is reduced below (100 nm) , its mechanical, thermal , optical ,magnetic and other properties change at some size characteristic of that material . Thus with