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7. Brief account of your research interests with special focus on Nano Science and Technology (strictly within 300 words):

RESEARCH INTERSET

- **Synthesis of semiconductor nanoparticles/ nanowires**

To synthesize nanoparticles/ nanowires, two techniques viz. Electrochemical and Chemical bath are being used. Different kind of nanoparticle viz. CdS, CdSe, HgS, HgTe and posous Si and nanowires viz. CdSe and HgTe have been synthesized by using these two technique.

- **Surface functionalization and Nano-bio hybrid structure:**

Attempts have been made to self – assemble the nanoparticles by surface functionalization procedure using DNA for technological application. Single stranded DNA tagged CdSe nanobead of 3nm size and ssDNA along with its conjugate tagged CdSe nanowire has been synthesized using the above principle. Similarly DNA tagged HgTe nanostars also synthesized using the same principle

where the nanowire and nanostar samples were proven to be very much useful for biomolecular recognition application. Si-Glucose and ZnO-Glucose nano-hybrid structures are under progress.

- **Synthesis of Metallic and Metal oxide clusters using vacuum systems :**

To synthesize metallic and metal oxide nano-clusters, Low Energy Cluster Beam Deposition (LECBD) technique is being used. The metallic and metal oxide nano-clusters viz. Sb, Se, Sb₂O₃, and SeO₂ are synthesized using LECBD technique and different properties have been studied.

- **Structure, Surface and Interface study**

The structure, surface and interface property of different nanostructures such as CdSe, CdS and HgTe using Transmission Electron microscope (TEM), Grazing angle X-ray diffraction (GAXRD) and Atomic Force Microscopy (AFM).

- **Optical characterization of Nanoparticles using different tools**

The optical properties CdSe, CdS, HgTe, HgS and Porous Si were studied using PL Micro Raman and Optical absorption and FTIR techniques. Biomolecular recognition with DNA tagged CdSe NWs has been established by photoluminescence measurements. Similarly different optical properties of other nanostructures such as CdS, HgTe, HgS and Porous Si have been studied.

- **Fabrication and study of ITO/nano-CdSe/Au Schottky device :**

The ITO/nano-CdSe/Au Schottky junction interface was characterized by current (I) –voltage (V) and capacitance (C) -voltage (V), as a function of frequency. The same has been compared with ITO/bulk-CdSe/Au Schottky junction interface.

8. Keywords related to your research interests (maximum 10, different lines separated by commas): Semiconductor nanomaterials, Nanorods, Nanowires, Nanoelectronic, Device, Quantum dots, DNA, Glucose, Protein,