S. Varma

1) Scanning Probe Microscopy (AFM, STM,MFM) for investigating Surfaces:

   Scanning Probe Microscopy (SPM) consists of many powerful techniques including Atomic Force microscopy (AFM), Scanning Tunneling Microscopy (STM), Magnetic Force Microscopy(MFM), Lateral Force Microscopy (LFM), conducting-AFM etc. which can be utilized to study surface modifications due to Dynamic interactions, Ion irradiation, Biomolecules, temperature etc. SPM will be used here to study some of these techniques on surfaces.

2) Raman Spectroscopy, Photoluminescence and UV-Visible-NIR spectroscopy

   These are important techniques for understanding the structural phases, disorders, refractive index, absorption, and transmission behavior at various wavelengths, and show applications in areas like solar cells, photocatalysis, sensors, thin films, nanostructures of metal-oxides, pervoskites, semiconductors, graphene, melting of DNA etc. Some of these properties will be investigated here using above techniques.

3) Investigating disorder Resistant properties of Graphene

   The single layer and multi-layer graphene layers have demonstrated excellent defect resistant properties which can be very important in many space applications as well as in many sensors. Ion irradiation can induce controlled disorder in graphene. Disorder and morphology of graphene layers will be investigated here by techniques like Atomic Force Microscopy, Raman Spectroscopy and UV-Vis-NIR spectroscopy.