

Present Research Programme Undertaken by the Department

1. Development & characterization of Advanced Materials for device applications

- Development and Characterization of metal doped Ferroelectric thin films by Pulsed Laser Deposition Method
- Development of lead free piezoelectric thin films and relaxors
- Effect of charge ordering, spin ordering in Structurally and electronically coupled as well as in improper multiferroics: Bulk and Thin Films
- Perovskite based thin films for Humidity/ Gas Sensor Applications: Optimizing defect chemistry for operating temperature and gas specificity
- Investigation of structural phase transitions and effect of stress / defects in multiferroic thin films using Polarized Raman and ESR Spectroscopy

2. Ion Beam Induced Material modifications

3. Material properties optimization through ion implantation

4. Semiconductor core shell structure Using Organic Capping

5. Molecular Dynamics and Structural Phase Transitions Using Spectroscopic Probes

6. Development of Ferroic Thin Films

7. Spectroscopy of heavy nuclei

8. Large basis nuclear shell model calculations using LINUX/WINDOWS cluster system

9. Study of Coulomb Crystal Formation

10. Formation of Dense Compact Astrophysical Systems

11. Dusty, Strongly coupled and Quantum Plasma