Research Trends

- Superconductivity
- Modeling of linear and non-linear optical properties of semiconducting quantum dots
- Modelling of new materials via atomistic (molecular-dynamics and Monte-Carlo) and ab-initio (Full-potential and pseudopotential) codes
- Ising, Hesisenberg, and Hubbard models -
- nano-electronic devices modeling,
- electron and spin transport,
- linear and non-linear optics,
- thermopower and figure of merit,
- spin waves,
- spin dynamics,
- noncollinear magnetism,
- structural phase transition,
- novel magnetic systems,
- new organo-metallic molecules, nanostructures,
- III-VI-II-VI semiconductors-based solar cells superlattices,
- low dimensional systems (quantum dots, clustrers, fullerences, nanotubes, nanowires,..etc),
- catalysis of nanoparticle systems,
- new thermoelectric materials,
- new superconductors with high-Tc,
- nanographene applied in photovoltaic devices,
- potential applications of novel two-dimensional materials in nano-electronic,
  spintronics, and thermoelectric devices.
- high-efficiency of new solar cell materials
- new hybrid perovskites for photovoltaic device applications.
- Chemical and biological sensing
- Magnetic ceramics/Ferrites
- Multiferroic Materials
- Supercapacitors
- Photocatalysts
-Density Functional Theory
- Triboelectrcity
-Micro and nanojoinig of dissimilar materials using femtosecond laser
- Spark Plasma Sintering applications in advanced materials
- Surface coatings and interfacial analysis
- Magnetic behaviour of soft magnetic films.
- Simulation of magnetic nanostructures.

- **Growth and characterization of 2D material films like graphene and TMDs materials (MoS2, WS2) and hetrostructures.**
- **Sensing and detection of heavy metal elements.**
- **Radiation Detectors**
- **Oxide Materials**