

Projects available for incoming Ph.D. students (admission in Semester-II, 2024-2025)

Artificial intelligence driven materials discovery for optoelectronics
Atomic scale imaging and spectroscopy studies of quantum materials
Nano-endoscopy for real-time cancer diagnosis
Multiferroicity and polar metallic states in oxide thin films and heterostructures
Spin-orbit torque for Memory applications
BSM physics through EWPT and GW
Electronics properties of twisted graphene layers and moiré materials (Broad area : Graphene related van der Waals heterostructures)
Particle in Cell simulations for laser interacting with magnetized plasma
Quantum communication networks under National Quantum Mission
optoelectronics of hybrid semiconductors
AdS/CFT duality and Quantum Information Theory
Developing micro-plasma discharges for energy application
Astrophysics, Gravitation and Cosmology
High Energy Particle Physics: Phenomenology of the strong force at small x
Laser Plasma Interactions
Quantum transport of topological phases of matter
Scanning Tunneling Microscopy & Spectroscopy study in superconducting thin films
Quantum computing and sensing with cold atoms
Physical properties of Sodium based complex oxides
"Silicon Carbide >> Based Power Devices
Energy harvesting using liquid crystals
Field emission study of nano-hybrid materials
Exploring 2D quantum materials from first principles
High-resolution Digital Holographic Hyperspectral Microscopy and Nanoscopy
Magnetic quasiparticle dynamics and their manipulation
Quantum-Inspired Oscillator Ising Machines using spin Hall nanooscillators
BSM physics through EWPT and GW
Fractional Chern Insulators (Broad area Topological Condensed Matter systems)
Particle in Cell simulations on finite sized plasma microdroplets
Quantum secure communication under National Quantum Mission
Studies on hybrid heterostructures
Magnetized Plasma Expansion
STM Study of Chiral Molecules on Surface
development of cost-effective Sodium-ion batteries
Entangled photon sources using liquid crystals
Exploring excited states from many body perturbative methods
Development of Hybrid spintronic-NV Quantum Sensor Platform
Particle in Cell simulations for long scale magnetic field generation in beam plasma interaction
Quantum Entanglement studies under National Quantum Mission
Photonic studies of Bio-compatible luminescent nanocrystals
Superconductivity