

Post-M.Sc. Theory Courses: Session 2022

Advanced Courses (Jan-April 2022, Semester-II):

1. *Gravity Waves & Astrophysics* Prof. Arunava Mukherjee
2. *Particle Physics* Prof. Ambar Ghosal & Prof. Prakash Mathews
3. *Quantum Field Theory-II* Prof. Arnab Kundu
4. *Advanced Condensed Matter Physics* Prof. Arti Garg
5. *Basic Ingredients of String Theory (Reading Course)*..... Prof. Harvendra Singh
6. *Research Methodology (Compulsory)*..... Prof. Kumar S. Gupta

Review/Project Topics offered:

1. "Topological properties of magnetic skyrmions": Topologically protected property of the skyrmions is the most important prerequisite to design magnetic skyrmion-based spintronics applications. In this project various mechanisms involved to generate skyrmions in magnetic systems will be reviewed.....**Prof. Kalpataru Pradhan**
2. "Time Crystals and many-body localization in the presence of time periodic drive": Student will read basics of many-body localization, quantum systems in the presence of time periodic drive and time crystals..... **Prof. Arti Garg**
3. "Strong Correlation Physics in twisted bilayer graphene and related heterostructures": Student will first review basics of strong correlation physics in context of Hubbard model. Then review literature on recently developed twisted bilayer graphene and related heterostructures and explore the strong correlation physics in these materials...**Prof. Arti Garg**
4. "Inferring neutron star EOS from gravitational wave astrophysics" **Prof. Arunava Mukherjee**
5. "Holographic methods in Quantum Entanglement": Student is expected to do a survey of recent progress in AdS/CFT and the entanglement entropy as per Ryu-Takayanagi proposal. **Prof. Harvendra Singh**