

INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE

2A&B, Raja S.C. Mullick Road, Jadavpur, Kolkata-700032, India

Seminar Notice

Org. by

Department of Materials Science

Title:	Thin-film Heterostructure of Quantum Materials and Novel Phenomena
Speaker:	Debakanta Samal, Institute of Physics, Bhubaneswar, Odisha, India
Date:	January 23, 2018 (Tuesday)
Time:	03:00 PM
Venue:	C V Raman Hall, IACS
Abstract:	Research in condensed matter physics and materials science in 21 st century has witnessed a paradigm shift in tailoring materials using atomic-layer-engineering scheme. Atomically engineered thin-films and heterostructures offer an exciting playground to precisely manipulate the electronic and/or lattice degrees of freedom at atomic scale. Assembling materials with distinct electronic, magnetic and structural properties in the so called 'designer' heterostructures engender new phases of electron matter and notable interfacial effects that can not be attained in the parent bulk constituents. In particular, heterostructures of quantum materials such as high-Tc cuprates, iridates, and various other electronically correlated and topological materials are fascinating and hold a lot of promise. The first part of this talk will focus on designed cuprate thin films (tetragonal SrCuO₂ & rocksalt CuO) that unveil novel structural, electronic and magnetic phenomena at unitcell level. It would further deliberate on new insights for realizing high-Tc superconductivity in synthetic infinite-layer based cuprate heterostructures. The second part will highlight on the possibility to realize bulk Dirac electrons in oxide layers. Though there have been studies on bulk Dirac electrons in binary compounds, complex oxide systems remains a largely unexplored territory. This part will survey the possible occurrence of Dirac semi-metallic state in inverse-perovskite and perovskite epitaxial thin films of Sr₃PbO and SrIrO₃ respectively.

All are cordially invited to attend the seminar