



**S N BOSE NATIONAL CENTRE
FOR BASIC SCIENCES**

Block JD, Sector III, Salt Lake, Kolkata 700 106

DEPARTMENTAL SEMINAR

Condensed Matter Physics and Material Sciences

22nd September'2021

4.00PM

MEETING LINK

SPEAKER

Prof. Dhanvir Singh Rana
Professor, Department of Physics,
Indian Institute of Science Education and Research (IISER) Bhopal

TITLE OF THE TALK

Terahertz Quasiparticle Electrodynamics in Transition Metal Oxides

ABSTRACT

Transition metal oxides (TMOs) are amongst the most contemporary topics in condensed matter research. For over past three decades, the most astounding discoveries of high temperature superconductivity, colossal magnetoresistance, multiferroics, topological matter and several other novel electronic and magnetic phases have been realized and hosted in the TMOs. Almost simultaneously and specifically during past five years, the implementation of Terahertz (THz) spectroscopy to unveil the complexity of such materials has delivered unprecedented success. THz spectroscopy extracts material parameters such as dynamic conductivity, dielectric constant and magnetic permeability in spectral range of 1-20 meV. This imparts the capability to probe a variety of quasiparticles emerging from the electrodynamics of collective, bound and free charge carriers, and complex spin orders, which is the key to unravel the complex phases of TMOs class of quantum matter. In this talk, I'll present some examples based on complex rare-earth nickelates and 5d transition metal iridates incorporating potential of spin-orbit coupling where several long-standing issues were resolved and there is enormous potential for lot more to offer, emphasizing the growing indispensability of THz technology in condensed matter.

HOST FACULTY

Dr. Thirupathaiiah Setti

Assistant Professor & Seminar Coordinator, CONDENSED MATTER PHYSICS AND MATERIAL SCIENCES
