**S N BOSE NATIONAL CENTRE**
**FOR BASIC SCIENCES**
*Block JD, Sector III, Salt Lake, Kolkata 700 106*

# DEPARTMENTAL SEMINAR

# Condensed Matter and Materials Physics

**12th November 2026** **4.00 PM** **FERMION**

**SPEAKER**



**Prof. Somnath Chanda Roy, Professor,**
**Semiconducting Oxide Materials, Nanostructures and Tailored Heterojunctions (SOMNaTH) Lab**
**Department of Physics, Indian Institute of Technology (IIT) Madras**

## TITLE OF THE TALK

**Highly aligned and vertically oriented metal oxide nanostructures : a pathway to investigate fundamental science and potential applications**

## ABSTRACT

**Highly aligned, vertically oriented nanostructures grown from an underlying substrate offer superior charge transport pathways, excellent optical absorption and catalytic properties. In particular, the metal oxide systems show better chemical and thermal stability leading to longer and repeatable operations. Chemical approaches offer simple and scalable ways to synthesize these nanostructures. One interesting aspect of these nanostructures is that each of them is single crystalline material offering pathway to investigate fundamental charge transport, photophysics and related behaviour and applications such as chemical sensing and solar energy harvesting. In this talk, I will present some of our works on electrochemically synthesized TiO 2 nanotubes, hydrothermally synthesized Fe 2 O 3 nanorods and CuO nanowires prepared by thermal annealing. Further, heterojunctions with graphene oxide will be discussed and their application to photoelectrochemical water splitting and photocatalytic CO 2 reduction will be presented.**

**HOST FACULTY**

**Prof. Thirupathaiah Setti, Professor**

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