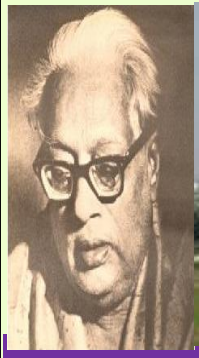

Bose Colloquium

S. N. Bose National Centre for Basic Sciences

(An Autonomous Research Institute established under DST, GOI)

25th February, 2026

3.00 PM

At Silver Jubilee Hall

YouTube Link

Webinar Link

Title: EXAFS: a local structural tool for understanding materials

Abstract: Understanding how atoms arrange themselves inside materials is central to explaining their properties and improving their performance. Yet in many functional materials, the most important structural details occur at the local scale, often invisible to conventional diffraction techniques.

Extended X-ray Absorption Fine Structure (EXAFS) is a powerful method that allows us to visualize the immediate atomic neighborhood around a chosen element. When a material absorbs X-rays, it emits a high-energy electron that travels through the surrounding atomic environment. As this electron scatters from nearby atoms, subtle interference effects arise, resulting in characteristic oscillations in the absorption signal. By analyzing these oscillations, we can determine distances to neighboring atoms, coordination numbers, and the degree of local disorder.

Although the experimental measurement is relatively straightforward, extracting reliable structural information requires careful modeling and physical insight. In this talk, I will introduce the basic ideas of EXAFS and illustrate how it helps uncover hidden local structures in a range of functional materials where the local environment of atoms or ions plays a decisive role in performance.

Speaker: *Prof Kaustubh R. Priolkar*

Director, UGC-DAE CSR, Indore and also a Senior Professor at the School of Physical and Applied Sciences, Goa University

Short Biography of the Speaker:

Prof. Kaustubh R. S. Priolkar is the Director of UGC-DAE Consortium for Scientific Research, Indore. He is also a Senior Professor at the School of Physical and Applied Sciences, Goa University. He received his M. Sc. And Ph.D. degrees from Goa University.

The major focus of his research is to study different functional materials using x-ray absorption fine structure spectroscopy. His research highlights the importance of local structural distortions and structural defects in functional properties of such materials.

He has published 136 research papers and has mentored 15 students for their doctoral thesis and about 40 students for their master's thesis. Prof. Priolkar has several awards to his credit. He was a visiting professor at the Chimie Paris-Tech, Paris, France and University of Duisburg-Essen, Duisburg, Germany. He serves as a member of several national level committees including the National Steering Committee of DST-DESY Programme of Cooperation for Petra III utilization.