
Synopsis Seminar

Seminar Title	: Tailoring Structural, Magnetic and Electrical behaviours in Substituted YCrO ₃ Perovskite
Speaker	: Sujata Kumari Ray (Rollno : 519ph1001)
Supervisor	: Suryanarayan Dash
Venue	: Seminar Room (MC-126), Dept. of Physics and Astronomy
Date and Time	: 16 Jul 2025 (11:00 AM)
Abstract	: Chromium-based perovskites have attracted considerable interest because of their intriguing magnetic and ferroelectric properties as well as potential technique applications. The set of chromium-based RCrO ₃ (R = rare earths, Y) compounds was suggested to be another family of multiferroic materials, usually displaying ferroelectricity, weak ferromagnetism, and a wide application in fields of catalyst, thermistor, solid-oxide fuel cell, and non-volatile memory devices. There are complex magnetic interactions between the Cr ³⁺ -Cr ³⁺ , Cr ³⁺ -R ³⁺ and R ³⁺ -R ³⁺ in RCrO ₃ bring out a variety of physics such as spin reorientation, temperature induced magnetization reversal, exchange bias and so on. In this endeavour, this thesis work focuses on the Yttrium chromite (YCrO ₃) due to its intriguing physical properties, including biferroic nature and mix phase behaviour. However, properties of pure YCrO ₃ are not substantial to fulfil the scientific demand. Substitution on Y site of YCrO ₃ is beneficial to improve its various physical properties. Lone pair active ion and rare-earth ion substitution is one of the desirable approaches in this regard, which really opens a new avenue for the researchers to tune the physical properties of the material. In this context, a series of (Bi ³⁺ and Sm ³⁺) doped YCrO ₃ have been prepared by sol-gel auto combustion route. The phase purity, structure, morphologies are characterized by XRD, FESEM techniques. Magnetic and electrical properties of the materials are thoroughly studied using SQUID-VSM and Impedance spectroscopy.