

### Synopsis Seminar

Seminar Title	: Tailoring Structural, Magnetic and Electrical behaviours in Substituted YCrO <sub>3</sub> Perovskite
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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 <sub>3</sub> (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 <sup>3+</sup> -Cr <sup>3+</sup> , Cr <sup>3+</sup> -R <sup>3+</sup> and R <sup>3+</sup> -R <sup>3+</sup> in RCrO <sub>3</sub> 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 <sub>3</sub> ) due to its intriguing physical properties, including biferroic nature and mix phase behaviour. However, properties of pure YCrO <sub>3</sub> are not substantial to fulfil the scientific demand. Substitution on Y site of YCrO <sub>3</sub> 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 <sup>3+</sup> and Sm <sup>3+</sup> ) doped YCrO <sub>3</sub> 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.