INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study	:	Ph.D.

Thesis Title: **Study of Negative Magnetization and Tunable Exchange Bias Behavior in Nanostructured Double Perovskites**

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Thesis Submitted to the Department/ Center	:	Physics
Date of completion of Thesis Viva-Voce Exam	:	25-01-2024
Key words for description of Thesis Work	:	Nanomagnetism, Double Perovskites, Negative Magnetization, Exchangebias Behavior, Spin Frustration.

SHORT ABSTRACT

The recent scientific focus on R_2CoMnO_6 (R is trivalent rare earth element) stems from its intriguingly complex magnetic behavior, which has opened up a diverse range of potential applications. Such as metamagnetic behavior, magneto-electric coupling, multiferroic behavior, spin-phonon coupling, magnetization reversal (MR) and tunable exchange bias behavior, magnetocaloric effect, low-temperature magnetic frustration and large magneto-resistance like properties. Few research groups have been started working on Ho_2CoMnO_6, and reported a FM T_C around 77 K, with a large magnetic entropy (ΔS_m) of value ~ 12 J/kg.K at a 7 T field. This feature makes this material applicable for magnetic refrigeration. R_2FeCrO_6 are also an important family of magnetic double perovskites, while Fe-Cr based perovskites have been extensively studied, there has been relatively limited exploration of Fe-Cr based double perovskites. Hence, our current research is centred on exploring the magnetic DP materials based on Co-Mn (Ho_2CoMnO_6) and Fe-Cr (Y_2FeCrO_6), with the primary objective of tuning and comprehending their magnetic properties in this direction. To the best of our understanding, there hasn't been much study done on nanostructured Ho_2CoMnO_6 and Y_2FeCrO_6 DPs, despite their high interest. In this work we have synthesizing nanostructured Ho_2CoMnO_6 and Y_2FeCrO_6 DPs and emphasis on the investigation of their structural and magnetic characteristics.