National Institute of Technology Rourkela

Registration Seminar

Seminar Title	: Investigation of Multiferroic Properties in Y-Type Hexaferrite
Speaker	: Gitanjali Palai (Rollno : 522ph1010)
Supervisor	: Prof. Anil Kumar Singh
Venue	: MC-126
Date and Time	: 27 Sep 2024 (03:45 PM)
Abstract	: The drive to create novel and miniaturized devices with multiple degrees of control has led to extensive research on multiferroic materials. Multiferroic materials are scientifically and technologically fascinating, not because of their ability to display multiple order states but because of the cross-coupling effects between them. This cross-coupling between electric and magnetic order is known as magnetoelectric coupling. This work focuses on polycrystalline, Y-type hexaferrite $Ba_2Mg_2Fe_{12}O_{22}$ (BMFO), which is synthesized using the sol-gel auto-combustion method. Room temperature Rietveld refinement of the X-ray diffraction pattern confirms the phase purity with the rhombohedral crystal structure (*R-3m* space group). From UV-visible measurement, the optical bandgap of BMFO is estimated to be ~ 1.66(7) eV. Temperature-dependent magnetic study observed the phase change at TC ~ 515 K. Temperature-dependent dielectric study attributes the ferroelectric transition at ~ 520 K. The occurrence of dielectric and magnetic phase transitions at nearly the same temperature suggests the presence of magnetodielectric (MD) coupling. This temperature-dependent MD effect value is calculated to be ~ -0.15% at an applied field of 1.3T. In her talk, the speaker will present her PhD registration seminar and discuss her plan of action for the next few years during her PhD tenure.