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**Multiferroic properties of artificially designed Perovskite-Spinel Heterostructures** SANDRA DUSSAN, MANOJ K. SINGH, RAM S. KATIYAR, University of Puerto Rico — Multiferroics materials are a class of functional material that combines two or more ordered parameters i.e. ferromagnetic, ferroelectric and ferroelastic. The recent finding of multiferroic composite material with the coexistence of these properties has attracted the attention of various researchers due to its potential applications in highly sensitive sensors and actuators as well as multistate memory devices. We synthesized and characterized  $\text{CoFe}_2\text{O}_4\text{-BiFeO}_3$  (CFO-BFO) heterostructure thin films grown on  $\text{SrTiO}_3(111)$ , (100) substrates using Pulsed laser deposition. The XRD patterns of CFO-BFO multilayered films evidenced that all peaks correspond to CFO and BFO structure also confirmed by their respective Raman spectra. We observed three peaks at 136, 168, and  $215\text{ cm}^{-1}$  that can be assigned to  $A_1(\text{TO})$  modes of the BFO pure phase and at 468 and  $695\text{ cm}^{-1}$  correspond to CFO. Room temperature M-H exhibited well-shaped magnetization hysteresis loops, good saturation and high coercivity. Preliminary results evidenced the existence of ferroelectricity and magnetic properties in heterostructure.

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