Contribution ID: **104** Type: **Poster**

Structural and magnetic characterization of $Pr_{0.5}Ca_{0.09}Sr_{0.41}MnO_3$ manganites

Tuesday, 14 April 2026 18:13 (7 minutes)

Manganites with a $CaMnO_3$-type structure are generally antiferromagnetic and insulating at low temperatures. However, chemical substitution with rare-earth elements induces strong competition between coexisting antiferromagnetic (AFM) and ferromagnetic (FM) phases, often leading to phase separation and field-induced metamagnetic transitions. These transitions can be understood as percolation events, where FM metallic clusters grow within an AFM insulating matrix until a conducting network spans the system at the percolation threshold, driving the metal-insulator transition. Despite extensive research, the coupling between structural distortions and magnetic ordering in these systems remains not fully understood.

Here, we present a structural and compositional characterization of $Pr_{0.5}Ca_{0.09}Sr_{0.41}MnO_3$ (PCSMO) powder. The crystal structure and phase purity were examined by X-ray diffraction (XRD) and Raman spectroscopy, while the elemental composition was analyzed using energy-dispersive X-ray spectroscopy (EDX). Magnetic characterization was done through vibrating sample magnetometry (VSM) measurements performed at different temperatures to evaluate magnetic transitions. Our results suggest potential applications in neuromorphic computing as well as in magnetic and thermal sensing devices.

Primary author: RODRIGUEZ, Gabriela (Los Andes University)

Co-authors: Mr HERNÁNDEZ, Daniel (Universidad de Los Andes); Dr RAMÍREZ, Juan Gabriel (Universidad de Los Andes); Dr CARRANZA, Diego (Universidad de Los Andes)

Presenter: RODRIGUEZ, Gabriela (Los Andes University)

Session Classification: Poster session

Track Classification: Statistical Physics