

# 2026 HBCU CHIPS Network Conference

Contribution ID: 46

Type: POSTER

## Structural, magnetic, and thermodynamic properties of Nd<sub>2</sub>MoO<sub>6</sub>

Rare-earth molybdates offer an ideal platform for exploring frustrated magnetism arising from the interplay of crystal electric field effects, exchange interactions, and lattice geometry. We report a comprehensive structural, magnetic, and thermodynamic study of the insulating rare-earth molybdate Nd<sub>2</sub>MoO<sub>6</sub>. Powder x-ray diffraction confirms a tetragonal crystal structure featuring a bilayered Nd sublattice separated by MoO<sub>6</sub> octahedral networks. Magnetic susceptibility and isothermal magnetization measurements reveal dominant paramagnetic behavior with strong low-temperature enhancement and no evidence of long-range magnetic ordering. Low-temperature heat-capacity measurements show no sharp anomaly down to the lowest measured temperatures. Instead,  $C_p/T$  exhibits a pronounced low-temperature upturn that is strongly suppressed by an applied magnetic field, indicating a magnetic origin. Analysis of  $C_p/T$  versus  $T^2$  reveals a finite  $T \rightarrow 0$  intercept, consistent with persistent low-energy magnetic excitations. The extracted magnetic entropy is strongly suppressed relative to the free-ion value for Nd<sup>3+</sup>, pointing to a highly frustrated or dynamically fluctuating magnetic ground state.

### Academic or Professional Status

Graduate Student

**Author:** KWABENA ONTUMI, Foster (Norfolk State University)

**Co-authors:** Prof. TEMPLE, Doyle (Norfolk State University); Mr DELGADO, Orion (Norfolk State University); Dr DHAKAL, Pashupati (Thomas Jefferson National Lab); Dr KARNA, Sunil (Norfolk State University); Dr WELP, Ulrich (Materials Science Division, Argonne National Lab)

**Presenter:** KWABENA ONTUMI, Foster (Norfolk State University)

**Session Classification:** Poster Session

**Track Classification:** Materials & Devices: Materials & Devices - (a)