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Magnetic order in $La_{1-x}Ca_xMnO_3$ nanopowder CHETAN DHITAL, Boston College, CLARINA DELA CRUZ, High flux Isotope reactor, Oak Ridge Tennessee, KEFONG WANG, Boston College, Chestnut Hill, MA,02467, JUN-MING LIU, Nanjing University, ZHIFENG REN, STEPHEN WILSON, Boston College, Chestnut Hill, MA,02467 — Here we present neutron diffraction studies exploring the spin behavior in nanocrystalline $La_{1-x}Ca_xMnO_3$ (LCMO). Confinement effects and the influence of phase separation have long been key issues within the underlying electronic behavior of the manganites. The coexistence of competing electronic phases has been reported across length scales exceeding 100nm in bulk manganites in proximity of the first-order metal-to-insulator phase transition in their phase diagrams. When the grain size of manganite crystals approaches the size of intrinsically phase-separated domains, new magnetic phases can be stabilized and the resulting electronic behavior dramatically altered. In this talk, we present results from our recent investigations of the magnetism in LCMO samples whose grain-size has been reduced to the nanometer scale. Newly stabilized static spin order and its relevance to phase separation in this manganite system will be discussed.

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