

Abstract

Chang-Beom Eom proposes a comprehensive project on the scientific understanding and discovery of a new class of spin manipulating heterostructures based on the quantum properties of noncollinear spin structured antiperovskite materials. The technical approach involves the development and implementation of synthesis approaches for atomic level control of epitaxial antiperovskite heterostructures, the application of forefront experimental spin imaging and characterization approaches, and the combination with theoretical analysis of noncollinear spin structures and their manipulation. This research is enabled by recent advances in the synthesis and understanding of antiperovskite interfaces, the generation of spin polarized currents by noncollinear spin structures, and the underlying relation between these spin structures and the antiperovskite electronic structure. The long-term goal of the research is to transform antiperovskites with noncollinear spin order into the next generation of spin quantum heterostructures for spintronics.