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Spin-orbit engineering in perovskite heterostructures BYOUNG-HAK LEE, Physics Department - Texas State University, GURU KHALSA, NIST - Natl Inst of Stds & Tech — There has been a steadily increasing interest in spin-orbit effects in systems with broken inversion symmetry. These effects may have technological applicability due to recent success in inducing dynamics and switching across heavy metal/ferromagnet interfaces through spin-orbit torque. In addition, broken inversion symmetry and large spin-orbit interactions can lead to novel magnetic and superconducting properties. Little effort has focused on developing a materials platform for studying these effects systematically. The versatility of perovskites along with recent advances in their epitaxial growth may provide such a playground. In this talk we discuss our theoretical efforts to engineer spin-orbit effects in materials systems based on perovskites. We show that Ruddlesden-Popper perovskites provide control of both spin-orbit strength and atomic scale broken inversion symmetry, providing new avenues for customizable materials. Using *ab initio* tools, we predict the spin-splitting in $SrTiO_3$ and $KTaO_3$ based Ruddlesden-Popper perovskites and contrast results with bare surfaces and interfaces.

Guru Bahadur Khalsa
NIST - Natl Inst of Stds & Tech

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