



Physical Sciences Seminar

Double-perovskite materials as a platform for studying spin-orbit-lattice entangled state

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Spin-orbit coupling (SOC) is important in understanding the physics of numerous magnetic materials. In particular, it was found that effective spin-half moments arising from the spin-orbit entangled state are responsible for many exotic quantum magnetism found in iridates and ruthenates. However, recent studies have cast doubt upon this simple atomic picture, illuminating the significance of lattice degrees of freedom in these materials. Double perovskite materials with a 5d1 electronic configuration offer an ideal platform for exploring such an interplay between the lattice and the spin-orbit entangled state. In this talk, I will give a brief overview of double-perovskite materials and present our latest findings from resonant inelastic X-ray scattering (RIXS) experiments. Our results reveal the presence of the dynamic Jahn-Teller effect in the $A_2\text{MgReO}_6$ ($A = \text{Ca}, \text{Sr}, \text{Ba}$) family of 5d1 double perovskites, indicating that the vibronic coupling must be included in the complete description of the ground state of magnetic materials with strong spin-orbit coupling.

Wednesday, April 24, 2024 11:00am - 12:00pm

Office Bldg West / Ground floor / Heinzl Seminar Room



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