Inducing quantum states in materials with light

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Abstract:

Recent advances in laser technology allow for higher levels of quantum state control in materials. In this talk, I will describe recent theoretical studies from my group exploring different mechanisms of quantum state control. I will discuss situations of coexisting competing orders, Floquet engineering of psuedo-magnetic fields, and a scheme for opto-electrical control of chiral lattice structure for reversable, non-contact enantiomer control in a material. The signatures of these states and transitions in various observables will be discussed, along with new frontiers for artificial intelligence in the theory of these systems.