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Title: Multipolar Spin Liquids

The Kitaev model, characterized by bond-dependent Ising spin interactions among spin-orbit entangled dipole moments in Mott insulators, offers a new approach to quantum spin liquids. Such bond-dependent interactions are not limited to Kramers doublets. In the $5d^2$ Mott insulators with strong spin-orbit coupling, the non-Kramers doublet hosts quadrupole and octupole moments while lacking a dipole moment. After a quick review of multipolar physics in double perovskites, I will present a microscopic theory of the multipolar interactions that exhibit bond-dependent quadrupole-quadrupole interactions. Remarkably, these interactions on the honeycomb lattice take the form of the extended Kitaev model including the bond-dependent off-diagonal and Heisenberg interactions. I will discuss a way to realize the exactly solvable Kitaev limit in multipolar honeycomb Mott insulators.