Delocalized Magnetism In the intercalated honeycomb iridate Ag3LiIr2O6

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Recognition that the Kitaev model, an exactly soluble quantum spin liquid, may have material realization in heavy transition metal oxides has driven significant research on the honeycomb iridates for the past decade. Although dominant Heisenberg exchange interactions these compounds result in low temperature magnetic order, Kitaev interactions are known to be strong, giving hope that chemical modification may stabilize a Kitaev spin liquid. The relevance of the Kitaev model stems from a balance of electronic correlations and spin orbit coupling that result in a localized spin-orbit entangled jeff=1/2 magnetic degree of freedom. Recently, a new intercalated honeycomb iridate, Ag3LiIr2O6 was shown to exhibit thermodynamic signatures of a spin liquid, potentially indicating dominant Kitaev interactions. In this talk, I will discuss a series of complementary local structure and x-ray spectroscopy measurements on Ag3LiIr2O6 that reveal a strong modification of the Ir electronic structure from the parent α-Li2IrO6. We find that a delocalized, molecular orbital, picture is more appropriate for understanding the magnetism in Ag3LiIr2O6 and the relevance of the Kitaev model is questionable. Our measurements show how intercalation can influence the single ion state in transition metal magnets and bring about new regimes of magnetism.