

MAR16-2015-000925

Abstract for an Invited Paper
for the MAR16 Meeting of
the American Physical Society

Resonant X-ray scattering studies of magnetic order and excitations in pyrochlore iridates.

DESMOND MCMORROW, London Center Nanotechnology

The rare-earth pyrochlore iridates ($R_2Ir_2O_7$, R=rare earth) have been proposed to host a number of exotic electronic states as a consequence of the existence of strong spin-orbit coupling of the Ir^{4+} ion in the presence of significant electron correlations. Of crucial importance to understanding whether any of these states can be realized in practice is to determine the effective low-energy Hamiltonian describing the system. Here we report a comprehensive series of resonant X-ray experiments, both elastic (REXS) and inelastic (RIXS), which reveal the nature of the magnetic order and excitations in single crystals of $Sm_2Ir_2O_7$ and $Nd_2Ir_2O_7$.