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Title: Magnetism in doped Honeycomb Iridates $N a_2Ir_{1-x}Ru_xO_3$

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Keywords: Magnetism
Chemistry
Physics

Issue Date: 21-Jul-2014

Publisher: IISER M

Abstract: A_2IrO_3 materials ($A=Na, Li$) have recently been shown to harbor novel magnetism and the possibility of spin liquids. The novel magnetism is thought to stem in part from the spin-orbit coupling present in these Iridates which leads to anisotropic exchange interactions which in turn lead to magnetic frustration as evident from large Weiss temperature compared to a relatively low ordering temperature. The aim of this project is to synthesize single crystals of $N a_2Ir_{1-x}Ru_xO_3$ ($x=0.02, 0.05, 0.1, 0.2, 0.3$) to study the effect of disorder, reduced spin-orbit coupling, and local moment impurities in the magnetic properties of the parent compound. There are also theoretical predictions that unconventional superconductivity might emerge in these systems if they can be turned metallic.

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