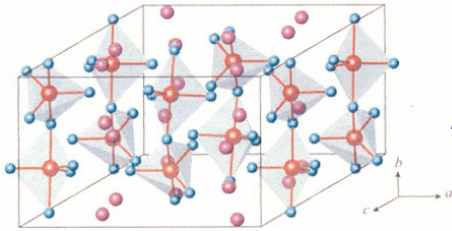
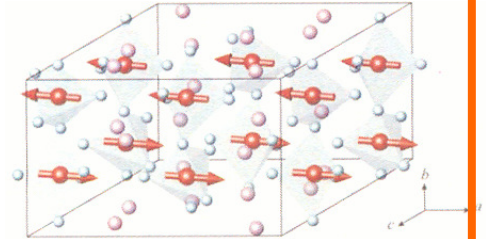


# Layered Iridates: A New Playground of Correlated Electrons



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**ABSTRACT:** The discoveries of exotic ground states (p-wave superconductivity, non-Fermi liquid) in layered ruthenates have inspired extensive investigations on 4d and 5d materials. Typified by their extended 5d orbitals, it is commonly expected that the iridates should be more metallic and less magnetic than their 3d, 4d and 4f counterparts, because of the broader 5d-bandwidth and the weaker exchange interaction  $U$ , so that  $Ug(E_F) < 1$ , where  $g(E_F)$  is the density of states at the Fermi energy  $E_F$ . However, in marked contrast to these expectations, most of the known iridates, such as layered  $\text{BaIrO}_3$  and  $\text{Sr}_{n+1}\text{Ir}_n\text{O}_{3n+1}$  ( $n = 1$  and  $2$ ), are insulators exhibiting weak ferromagnetism. These layered iridates order at relatively high temperatures ( $T_C = 175, 240,$  and  $285$  K for  $\text{BaIrO}_3, \text{Sr}_2\text{IrO}_4$  and  $\text{Sr}_3\text{Ir}_2\text{O}_7$ , respectively), but they attain only a small fraction of the expected ordered moment. The iridates exhibit strong phase transition signatures in magnetization but none of their  $T_C$ 's and resistivities is very sensitive to high magnetic fields. Although a metallic state does not commonly occur in the iridates, the unusual circumstances cited above almost guarantee that it will exhibit extraordinary properties when it does occur. In this talk, anomalous transport and thermodynamic properties of non-Fermi-liquid  $\text{SrIrO}_3$  will be presented and discussed along with comparisons drawn with other related iridates and ruthenates.

**Condensed Matter Seminar**  
**Monday, September 10, 2007, 4:00pm in Robeson 304**  
**Coffee & cookies at 3:30 pm**