Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Pressure Induced Metal Insulator Phase Transition in $Eu_2Ir_2O_7$
FAZEL FALLAH TAFTI, JUN ISHIKAWA, YO MACHIDA, ALIX MCCOLLAM, SATORU NAKATSUJI, STEPHEN JULIAN — The metal to insulator phase transition of the pyrochlore iridate $Eu_2Ir_2O_7$ has been studied by means of resistivity measurements under pressure in the range 2 to 12 GPa. At ambient pressure, the system is a "metal" at high temperatures with a non-metallic rise of resistivity with decreasing temperature followed by a metal-insulator phase transition at T_{MI} below which it becomes insulating. With increasing pressure, a cross-over from non-metallic to metallic appears in the resistivity curves at a temperature $T^* > T_{MI}$. As the pressure is further increased T^* rises, T_{MI} drops and the low temperature insulating phase melts into a metallic phase through a continuous transition at P $\sim$ 7.8 GPa. The high pressure metallic phase is rather curious and exhibits two characteristic features of Kondo metals: a minimum resistivity and a logarithmic rise of resistivity at low temperatures. We will show that there is a remarkable correspondence between the resistivity curves measured at various pressures and those obtained by successively replacing the R site of the $R_2Ir_2O_7$ family by larger rare earth atoms.

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Date submitted: 28 Dec 2010 Electronic form version 1.4