Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Visualizing Heavy Fermions in Thin Films by in situ ARPES SHOUVIK CHATTERJEE, DARRELL SCHLOM, KYLE SHEN, Cornell University — Heavy Fermions are an important class of materials, which has attracted a lot of interest as they seemingly host a number of exotic ground states viz. unconventional superconductivity, Quantum Critical Fermi Liquid, FFLO states etc. Stabilizing these materials in a thin film form and extraction of their spectral function via ARPES opens up new possibilities of dimensional and strain tunability and in understanding and designing materials with exotic emergent properties. I will present our recent efforts in stabilizing thin films of Yb based heavy fermion compound $YbAl_3$ and the conventional metal analog $LuAl_3$ on MgO substrates. With the aid of an Al buffer layer crystalline, phase pure and fully-oriented epitaxial thin films can be grown with sub-nm surface roughness. Using *insitu* angle resolved photoemission we, for the first time have been able to directly map out their electronic bandstructure and Fermi Surface. Measurements on $LuAl_3$ were found to be in good agreement with ab-initio calculations that provided us with an excellent reference to identify the signatures of heavy fermion formation in $YbAl_3$.

Shouvik Chatterjee
Cornell University

Date submitted: 14 Nov 2014 Electronic form version 1.4