

Abstract Submitted
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Visualizing the Emergence of Heavy Fermions in a Kondo Lattice (Part I)¹ EDUARDO H. DA SILVA NETO, PEGOR AYNANIAN, Princeton University, RYAN BAUMBACH, J.D. THOMPSON, Los Alamos National Laboratory, ZACHARY FISK, University of California, Irvine, ERIC BAUER, Los Alamos National Laboratory, ALI YAZDANI, Princeton University — The interaction between magnetic moments and conduction electrons is at the heart of many phenomena in condensed matter physics, from the Kondo effect in magnetic alloys and nanostructures to superconductivity in strongly correlated systems. We use the scanning tunneling microscope (STM) to detect the emergence of these heavy excitations with lowering of temperature in a prototypical 115 family of Ce-based heavy fermion compounds. Experiments on different atomically terminated layers and their modeling are used to demonstrate the sensitivity of the tunneling process to the composite nature of these heavy quasiparticles, which arise from quantum entanglement of itinerant conduction and f -electrons. The momentum space electronic structure of those heavy excitations will be discussed in the next talk by Pegor Aynanian.

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