

Abstract Submitted  
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**Real-space imaging of Kondo screening in a two-dimensional Kondo lattice**<sup>1</sup> YING JIANG, YANNING ZHANG, JUEXIAN CAO, RUQIAN WU, WILSON HO, Department of Physics and Astronomy, University of California, Irvine, CA 92697-4575 — Kondo lattice systems exhibit nonuniversal many-body behaviors, mainly resulting from the competition and interplay between onsite Kondo screening and intersite coupling. In reduced spatial dimensions, the many-body correlation effects are expected to be more relevant. We report the realization of a two-dimensional (2D) Kondo lattice formed by self-assembled triplet oxygen molecules on the Au (110)-1×2 reconstructed surface. By mapping the Kondo resonance in the 2D O<sub>2</sub> lattice with a scanning tunneling microscope, the interplay between the intermolecule coupling and the onsite Kondo effect was manifested as the unexpected coexistence of both local and nonlocal Kondo screening at the atomic level. While the latter provides evidence of the collective deconfinement of magnetization in Au, the former shows local hybridization between the Kondo clouds of nearest-neighbor O<sub>2</sub> molecules, as revealed by density functional calculations. These findings may assist in our understanding of the unusual electronic properties in various strongly correlated electron systems, such as heavy fermion compounds and Kondo insulators.

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