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Tracking Cooper Pair Formation in a Cuprate Superconductor: An Ultrafast ARPES Study CHRISTOPHER SMALLWOOD, JAMES HINTON, Department of Physics, UC Berkeley; Materials Science Division, LBNL, CHRIS JOZWIAK, Advanced Light Source, LBNL, WENTAO ZHANG, JAKE KORALEK, Materials Science Division, LBNL, HIROSHI EISAKI, Nanoelectronics Research Institute, National Institute of Advanced Industrial Science and technology, DUNG-HAI LEE, JOSEPH ORENSTEIN, ALESSANDRA LANZARA, Department of Physics, UC Berkeley; Materials Science Division, LBNL — A basic mystery in high temperature superconductivity is the process that drives quasiparticles to form Cooper pairs, the fundamental charge carriers in any superconductor. We use time- and angle-resolved photoemission spectroscopy (TR-ARPES) to measure the relaxation dynamics of low energy excitations in the optimally doped cuprate superconductor Bi-2212. Results are discussed within the context of the Rothwarf-Taylor model of quasiparticle recombination.

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