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Oliver E. Buckley Condensed Matter Prize Talk: High-resolution Photoemission Studies of the High Tc Superconductors[1]

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In the last decade, high resolution angle-resolved photoelectron spectroscopy has evolved into one of the most powerful probes of the electronic structure of condensed matter systems. This development reflects new technological advances coupled to the enormous research effort devoted to the study of strongly correlated systems, particularly the high T_c cuprate superconductors. Two decades after their initial discovery the latter still present some of the biggest challenges for materials science. In this talk we review some of the developments in new instrumentation and analysis techniques in photoemission and include discussion of both self-energy effects and Fermi surface studies. In the latter case, the discussion will focus on the pseudogap phase of the underdoped cuprates with particular reference to an observed particle-hole asymmetry and the possibility of hole pockets.

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