

Abstract Submitted  
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**New insights into cuprate superconductivity and pseudogap by STM of BSCCO** E.W. HUDSON, GREGORY LAU, M.C. BOYER, W.D. WISE, MIT, KAMALESH CHATTERJEE, Baker Hughes, MICHELLE TOMASIK, LAURA POPA, MIT, TAKESHI KONDO, Ames Laboratory and Dept. of Physics and Astronomy, Iowa State University, TSUNEHIRO TAKEUCHI, HIROSHI IKUTA, Nagoya University — Using a new fitting method which enables us to extract k-space information from STM spectroscopy, we have obtained spatially dependent measurements of the superconducting gap and pseudogap structure as a function of temperature and doping in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$  (Bi-2212) and  $\text{Bi}_2\text{Sr}_2\text{CuO}_{6+x}$  (Bi-2201). These results confirm our previous picture of spatially homogeneous superconductivity with a gap that closes at  $T_C$  coexisting with an inhomogeneous pseudogap [1]. They also highlight the particle-hole asymmetry of the pseudogap. This, when combined with local measurements of the checkerboard charge order, which we have attributed to a charge density wave [2], provides new insight into the nature of the pseudogap state. [1] Boyer *et al*, *Nat. Phys.* **3**, 802 (2007) [2] Wise *et al*, *Nat. Phys.* **4**, 696 (2008) ; *Nat. Phys.* **5**, 213 (2009)

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