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**Scanning tunneling spectroscopy studies of $Bi_2Sr_2CaCu_2O_{8+x}$ from the strongly underdoped to strongly overdoped regime**

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Using atomically resolved scanning tunneling microscopy (STS), we investigate the electronic structure $Bi_2Sr_2CaCu_2O_{8+x}$ across a range of doping levels from x $\sim$ 0.1 up to as high as $\sim$0.23, with significant changes in electronic structure observed above p$\sim$0.21. New sample preparation processes [1] were used to produce heavily overdoped crystals suitable for the imaging of various forms of electronic heterogeneity. The evolution of the gap map $\Delta$(r), coherence peak height map A(r), the inelastic tunneling signatures $\omega$(r), and the quasiparticle interference LDOS modulations, as well as their interrelations across this range of doping levels, will be presented.

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[1] J. Slezak, K. Fujita, J. C. Davis, in preparation (2005)