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**Atomic Resolution Scanning Tunneling Microscopy of Electron-Doped  $\text{Pr}_{1-x}\text{LaCe}_x\text{CuO}_{4-\delta}$**  SHANKAR KUNWAR, FRANCIS NIESTEMSKI, VIDYA MADHAVAN, Boston College — The study of electron-doped superconductors offers a new window into the still intractable problem of high temperature superconductivity. While hole-doped High  $T_C$  superconductors have been extensively studied with scanning tunneling microscopy (STM), there has been very little atomic resolution STM data on electron doped superconductors. We present STM images of *in situ* cleaved  $\text{Pr}_{1-x}\text{LaCe}_x\text{CuO}_{4-\delta}$  (PLCCO), obtained with a low temperature (5.6K), ultra high vacuum (UHV) STM. Due to the post annealing process required for superconductivity, superconducting PLCCO is expected to contain between 0.1% to 1% of the oxide impurity phases,  $(\text{Pr}, \text{Ce})_2\text{O}_3$ . Our STM data on superconducting PLCCO reveal a few different atomic scale features, some of which have a periodicity consistent with the lattice constant expected for the impurity phases. Spectroscopy performed on these areas reveal gaps in the meV energy range. Possible origins of these and the other atomic scale structures will be discussed in this talk.

Shankar Kunwar  
Boston College

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