

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**Scaling of the transition temperature of hole-doped cuprate superconductors with the charge-transfer energy** CHUCK-HOU YEE, Rutgers University, CEDRIC WEBER, University of Cambridge, KRISTJAN HAULE, GABRIEL KOTLIAR, Rutgers University — We use first-principles calculations to extract two essential microscopic parameters, the charge-transfer energy and the inter-cell oxygen-oxygen hopping, which correlate with the maximum superconducting transition temperature  $T_{cmax}$  across the cuprates. We explore the superconducting state in the three-band model of the copper-oxygen planes using cluster Dynamical Mean-Field Theory with an exact diagonalization impurity solver. We find that variations in the charge-transfer energy largely accounts for the trend in  $T_{cmax}$  across the cuprate families.

Chuck-Hou Yee  
Rutgers University

Date submitted: 16 Nov 2011

Electronic form version 1.4