

Abstract Submitted
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Enhanced Surface Superconductivity in Single Crystal $\text{La}_{2-x}\text{Ba}_x\text{CuO}_4$ IVAR MARTIN, Argonne National Laboratory, XIAN YANG TEE, Nanyang Technological University, Singapore, TOSHIMITSU ITO, TOMOHARU USHIYAMA, YASUHIDE TOMIOKA, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan, CHRISTOS PANAGOPOULOS, Nanyang Technological University, Singapore — Surfaces of materials often possess properties which are distinctly different from their bulk. The atomic structure can develop intricate new patterns due to surface reconstruction and the electronic properties can be very distinct, as most dramatically manifested in topological insulators. However, more subtle collective phenomena such as superconductivity are not as strongly affected by the presence of surfaces. Here, we report an unprecedented finding of enhanced superconductivity at the ab-plane surface of high- T_c cuprate $\text{La}_{2-x}\text{Ba}_x\text{CuO}_4$. Spatially-resolved electrical and thermoelectric transport measurements detect a superconducting surface below the transition temperature T_{cs} which is considerably higher than the bulk T_c . The effect is pronounced in the region of charge carrier doping (x) with strong spin-charge stripe correlations. Notably, for $x = 0.12$, T_{cs} reaches 36 K, exceeding even the highest reported bulk T_c in this material for any doping. Possible interpretations for the novel effect are discussed.

Ivar Martin
Argonne National Laboratory

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