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Giant proximity effect in a phase-fluctuating superconductor DOMINIC MARCHAND, LUCIAN COVACI, MONA BERCIU, MARCEL FRANZ, Department of Physics and Astronomy, University of British Columbia — When a tunneling barrier between two superconductors is formed by a normal material that would be a superconductor in the absence of phase fluctuations, the resulting Josephson effect can undergo an enormous enhancement. We establish this novel proximity effect by a general argument as well as a numerical simulation and argue that it may underlie recent experimental observations of the giant proximity effect between two cuprate superconductors separated by a barrier made of the same material rendered normal by severe underdoping.

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