

Researchers discover 'exotic' interface between two materials

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In another step toward understanding matter at its most fundamental levels, Cornell researchers have found that two rather conventional materials can be made to exhibit very unconventional properties when they interface.

David A. Muller, Cornell professor of applied and engineering physics, and graduate student Lena Fitting Kourkoutis, along with European colleagues, created a superconducting phase at the atomic interface of two oxygen-based compounds by exposing them to the extremely cold temperature of 200 millikelvin (about minus 459 degrees Fahrenheit) -- close to absolute zero on the temperature scale. A superconductor is capable of conducting electricity with virtually no resistance.

The scientists reported these findings in an August edition of *Science Express*, which provides early online publication of selected regular articles from the journal *Science*.

The two oxides, lanthanum aluminate and strontium titanate, are ordinarily good insulators, or poor conductors, of electricity. Though the compounds by themselves are insulators, at their interface, the scientists were able to create a superconducting phase, or a phase of perfect electrical conductivity.

"It would be a bit like sticking together two different flavors of Wonder Bread and finding that it made its own chocolate raspberry truffle jam," Muller said.

Source: Cornell University

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