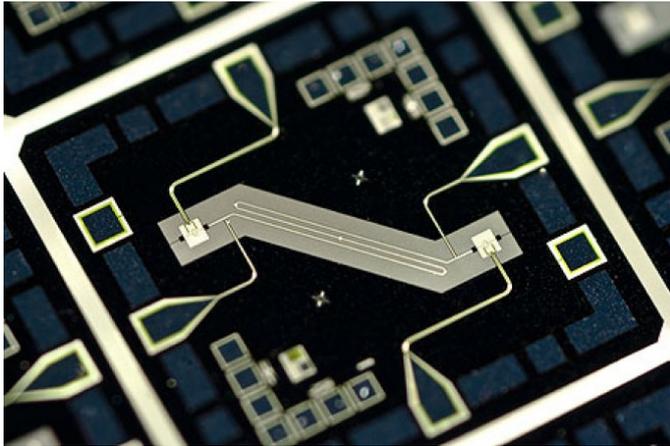


Quantum Entanglement Made Visible

Laura Sanders

Editor's Note: Quantum Entanglement is one of those things that would be so damn useful if we can get it to work right. A related article on how human eyes can detect quantum effects can be found on the Physorg.com website [HERE](#) [1].



([Wired News](#) [2]) - By linking the electrical

currents of two superconductors large enough to be seen with the naked eye, researchers have extended the domain of observable quantum effects. Billions of flowing electrons in the superconductors can collectively exhibit a weird quantum property called entanglement, usually confined to the realm of tiny particles, scientists report in the September 24 Nature.

Entanglement is one of the strangest consequences of quantum mechanics. After interacting in a certain way, objects become mysteriously linked, or entangled, so that what happens to one seems to affect the fate of the other. For the most part, researchers have only found signs of entanglement between tiny particles, such as ions, atoms and photons.

John Martinis and colleagues at the University of California, Santa Barbara looked for entanglement between two superconductors, each less than a millimeter across. These superconducting circuits, made of aluminum, were separated by a few millimeters on an electronic chip. At low temperatures, electrons in the superconductors flow collectively, unfettered by resistance.

Despite each superconductor's relatively large size, the electrons within move together in a naturally coherent way. "There are very few moving parts, so to speak," Girvin says, which helped the scientists spot evidence of entanglement. "It's a general fact that the larger an object is, the more classical it is in its behavior, and the more difficult it is to see quantum mechanical effects."

After attempting to entangle the superconducting circuits, Martinis and his team measured the directions of the currents 34.1 million times. When one current flowed clockwise (measured as a 0), the team found, the other flowed

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counterclockwise (measured as a 1) with very high probability. So the two were linked in a way that only quantum mechanics could explain.

[Click Here](#) [3] for the rest of the article.

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