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# Chiral Superconductivity on a Silicon Surface

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## Abstract

Chiral superconductors represent an exotic and heavily pursued state of matter where the angular momentum state of the superconductive Cooper pairs is ‘unconventional’ and time-reversal symmetry is broken. While there are several candidates for the realization of chiral superconductors, including e.g.  $\text{Na}_x\text{CoO}_2$  and hole-doped graphene, conclusive evidence for the existence of chiral superconductivity has yet to be established. Here we present evidence for the existence of chiral d-wave superconductivity in a dilute monatomic Sn layer on the Si(111) surface. This triangular single-band antiferromagnetic Mott insulator becomes superconducting upon hole doping, with a critical temperature reaching 9 K. With a coverage of only 1/3 monolayer of Sn, this represents the thinnest and most dilute superconductor known to date. Importantly, chirality produces a unique feature in quasi-particle interference images below the superconducting  $T_c$ , while the experimental edge state spectra are consistent with the calculated edge states for a chiral d-wave order parameter. Whereas most candidates for chiral superconductivity are complex materials, the simplicity and experimental control of simple adsorbate systems provide a powerful testbed for theoretical models and discovery of elusive phases of quantum matter.

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