

Odd-frequency pairing induced by magnetic impurities in superconductors

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The study of magnetic impurities has received a recent resurgence of interest, fueled in part by possible sightings of topological superconductivity in chains of magnetic adatoms on superconducting substrates or the Majorana edge modes of two-dimensional topological superconductors. More than forty years ago, Berezinskii proposed that the pairing function can be odd under time exchange. It has been realized that odd-frequency pairing should appear in heterostructures made of a conventional s-wave superconductor and a ferromagnet which breaks time-reversal symmetry. Here, we will show experimental evidence of the existence of odd- ω pairing in the simplest hybrid system: a single magnetic impurity immersed in a conventional s-wave superconductor, a Pb/Si(111) monolayer. Using measurements of the local electron density of states by STM, we show explicitly how the superconducting odd- ω pairing function can be extracted [1].

[1] V. Perrin et al., Physical Review Letters 125, 117003 (2020).