

Abstract Submitted
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Observation of a mixed pairing state in a mesoscopic-sized Ru island embedded in Sr_2RuO_4 : Interplay between the condensation and the Josephson coupling energies LIBIN WEN, SHUN WANG, HUI XING, Shanghai Jiao Tong University, ALEX YING, BRIAN ZAKRZEWSKI, Pennsylvania State University, JIAN-JIAN GE, ZHIQIANG MAO, Tulane University, YING LIU, Pennsylvania State University, Shanghai Jiao Tong University — A bulk crystal possessing an inversion symmetry can only host either an even-parity, spin-singlet, or odd-parity, spin-triplet superconducting pairing state. As the size of the superconductor is reduced and the inversion symmetry is lost because of the boundary effects, however, a mixed pairing state featuring both odd- and even-parity pairings is allowed by symmetry considerations and can be realized if a proper mechanism exists to facilitate the condensations in both pairing channels. In this talk we report the observation of a mixed pairing state in a mesoscopic-sized Ru island embedded in odd-parity, spin-triplet superconductor Sr_2RuO_4 found in the so-called eutectic phase of Sr_2RuO_4 -Ru. Even though the bulk Ru features only spin-singlet pairing, evidence for a superconducting condensate in the spin-triplet channel was found in the current system from magneto electrical transport measurement through a single Ru island. We argue that the occurrence of the mixed pairing state arises from the interplay between the condensation and the Josephson coupling energies.

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