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Superconductivity and Ferromagnetism in AEuFe₄As₄ (A = Rb and Cs).¹

GUANG-HAN CAO, Zhejiang Univ

Superconductivity (SC) and ferromagnetism (FM) are mutually antagonistic collective phenomena in solids, and therefore, bulk SC rarely coexists with FM in a single material. Here we report evidence of coexistence of bulk SC and full FM in 1144-type iron pnictides AEuFe₄As₄ (A=Rb and Cs), variants of EuFe₂As₂ in which every alternate Eu layer is replaced by non-magnetic Rb/Cs layer. Both materials show bulk SC at 35-36 K and Eu-spin ferromagnetic ordering at ca. 15 K. The robustness of SC and FM in AEuFe₄As₄ suggests that the expected mutual suppression between SC and FM can be minimized via a certain mechanism, which may shed light on the mechanism of iron-based SC.

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