

Abstract Submitted  
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**Superconductivity and magnetism in  $\text{Eu}_{1-x}\text{K}_x\text{Fe}_2(\text{As}_{1-y}\text{P}_y)_2$**  H.S. JEEVAN, J. MAIWALD, PHILIP GEGENWART, Physikalisches Institut, Georg-August-Universitaet Goettingen, D-37077 Goettingen, Germany, DEEPA KASINATHAN, HELGE ROSNER, MPI CPfS - Dresden — We report detail investigation of superconductivity and magnetism in  $\text{EuFe}_2\text{As}_2$  by doping of K in Eu site and P in As site. In this new class of FeAs-based superconductors, it is found that superconductivity appears close to a magnetic instability, suggesting a possible unconventional pairing mechanism. We have synthesized single crystals of both doped and undoped samples and investigated their physical properties by means of heat capacity, resistivity, magnetization and thermal conductivity measurements. The parent compound shows an antiferromagnetic spin-density-wave ( $T_{SDW}$ ) at  $\approx 190\text{K}$  related to the  $\text{Fe}_2\text{As}_2$  layers and magnetic ordering of  $\text{Eu}^{2+}$  ( $T_N$ ) moments at  $\approx 20\text{K}$ . Upon doping Eu with K  $>30\%$ ,  $T_{SDW}$  gets suppressed and superconductivity (SC) appears at  $\approx 32\text{K}$  and also  $\text{Eu}^{2+}$  ordering suppressed to the low temperature. On the other hand, P doping to the As site suppresses the SDW transition and results in SC, but Eu ordering remains undisturbed. Further increasing the P doping, Eu order transitions from AFM to FM phase which leads to disappearance of SC. We will compare our experimental findings with density functional theory based calculations.

Deepa Kasinathan  
MPI CPfS

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