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Evolution of superconductivity and magnetic order in $LaRu_3Si_2$ by rare earth and transition metal substitutions. RENXIONG WANG, SHANTA R. SAHA, JOHNPIERRE PAGLIONE, Ceter for Nanophysics and Advanced Materials, Department of Physics, University of Maryland, College Park, MD 20742, DANIEL PRATT, QINGZHEN HUANG, JEFFREY W. LYNN, NIST Center for Neutron Research, Gaithersburg, MD 20899 — The recent discovery of high temperature superconductivity in iron based materials has renewed interest to condensed matter physics. Although its mechanism is not yet settled completely, it should have a close relationship with the electron correlations. The compound $LaRu_3Si_2$ shows superconductivity with a transition temperature $T_c = 7.8$ K. Recent study indicates that electron correlations play a significant role for superconductivity in this Kagome lattice of Ru and the Ru band dominates at the Fermi level, similar to Fe-band in iron-superconductors. Superconductivity in $LaRu_3Si_2$ has been found robust against the local paramagnetic moment. We will present our study on the evolution of superconductivity and magnetic order in $LaRu_3Si_2$ due to substitutions of Tm, a J=6 (J is the total angular momentum) ion with a maximum ordered moment of 7 μ_B, and transition metals by measuring magnetic, transport and Neutron scattering properties.

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