

Abstract Submitted  
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**Superconductivity in  $R_3T_4Ge_{13}$  ( $R = Y, Lu$  and  $T = Rh, Co, Os$ ) single crystals**<sup>1</sup> BINOD RAI, Rice University, IAIN OSWALD, University of Texas at Dallas, JIAKUI WANG, Rice University, GREGORY MCCANDLESS, JULIA CHAN, University of Texas at Dallas, EMILIA MOROSAN, Rice University — Single crystals of  $R_3T_4Ge_{13}$  ( $R = Y, Lu$  and  $T = Rh, Co, Os$ ) have been grown by flux methods and have been found to adopt the  $Pr_3Rh_4Sn_{13}$  structure type. Magnetization and specific heat measurements confirm that all four compounds are bulk superconductors. Reduced superconducting gaps observed in the specific heat suggest that these may be multi-band superconductors. We observe an unusual increase of the electrical resistivity and a decrease of the charge carrier density on cooling in the normal state in all four reported compounds. However, band structure calculations reveal a metallic ground state in all four compounds, consistent with the emergence of superconductivity at low temperatures. We empirically show that large atomic displacement parameter ratios in  $R_3T_4Ge_{13}$  compounds are correlated with the semiconducting-like behavior, resolving the contradiction between the experiment and the calculations.

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