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Hydrostatic High-Pressure Studies to 25 GPa on the Model Superconducting Pnictide $LaRu_2P_2$[1] NEDA FOROOZANI, JINHYUK LIM, JAMES SCHILLING, Washington University in St. Louis, ROXANNA FOTOVAT, CHONG ZHENG, Northern Illinois University, ROALD HOFFMANN, Cornell University — Prior to the discovery of the Fe-pnictides in 2008, the ruthenium phosphide $LaRu_2P_2$ possessed the highest value of the superconducting transition temperature $T_c \approx 4$ K in the entire pnictide family. Recently, there has been renewed interest in this compound in an effort to understand why its T_c value is as much as 15x lower than for some Fe-pnictides. Recent soft x-ray angle-resolved photoemission spectroscopy studies [1] have revealed that $LaRu_2P_2$ exhibits Fermi liquid behavior with weak electron-electron correlations. The superconducting properties of $LaRu_2P_2$ are also more isotropic than those of the Fe-pnictides. Unfortunately, the dependence of T_c on hydrostatic pressure has not yet been determined, although such studies have an excellent track record for uncovering valuable systematics and pointing the way to higher T_c values. We report the first measurement for $LaRu_2P_2$ of the dependence of T_c on hydrostatic pressure. In these studies a He-gas system provides pressures to 1 GPa followed by a He-loaded diamond-anvil cell to higher pressures. T_c initially increases under pressure, but exhibits a relatively sharp downturn above 2 GPa, indicating a possible structural phase transition. The results of these studies are compared to related work on the Fe-pnictides. [1] Razzoli *et al.,* Phys. Rev. Lett. 108, 257005 (2012).

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