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IRIDIUM-THULIUM EUTECTICS, A BINARY MAGNETIC SUPERCONDUCTOR

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GJ 3 Iridium-Thulium Eutectics, A Binary Magnetic Superconductor.* J. L. Smith, Z. Fisk,** J. A. O'Rourke, J. D. Willis, and B. T. Matthias,** Los Alamos Scientific Laboratory.--Iridium-yttrium eutectics with a layered structure of Ir and YIr₂ show an extraordinary enhancement of the superconducting transition temperature over that of either phase. In the similar Ir-Tm system, the TmIr₂ present in the layers orders magnetically at 0.96 K.^c In samples of composition near Ir Tm₂, a superconducting transition is seen

at 1.9 K^B by resistivity and ac susceptibility measurements. While it remains difficult to identify the superconducting phase, it can only be due to some combination of Ir and Tm. This is a significant demonstration of the importance of eutectics because the superconductivity occurs in the presence of probable local moments.

*Work performed under the auspices of the Department of Energy

**Also at UCSD, La Jolla, CA where the research is sponsored by NSF DMR 77-08469.

¹Deceased, formerly also at Bell Laboratories.

²B. T. Matthias et al., Science 208, 401 (1980).

³J. L. Smith and B. T. Matthias, J. Mag. Mag. Materials 21, L203 (1980).