

Abstract Submitted  
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**Synthesis of Large Single Crystals Within the Zr - Fe - Si System<sup>1</sup>**

GREG SMITH, JACOB E. GROSE, J.W. SIMONSON, M.C. ARONSON, Physics and Astronomy Dept., Stony Brook University — The synthesis of large single crystals of intermetallic silicides from a metal flux is challenging, owing to the poor solubility of silicon in many of the traditional fluxes at low temperatures. Accordingly, single crystal syntheses of several compounds within the Zr - Fe - Si system from a gallium flux were investigated.  $Zr_4Fe_4Si_7$ , a member of the well-known V-phase family of compounds, forms as silver lustrous rods. Successful growths yielded crystals with dimensions up to 12.1 mm by 0.14 mm by 0.14 mm, large enough to perform the first transport measurements of this compound. We grew for the first time single crystals of the hexagonal Laves phase  $ZrFe_{1.5}Si_{0.5}$ , which has previously only been reported in the polycrystalline form. Two previously unreported phases, including the silver lustrous rods  $Zr_{2-x}Fe_4Si_{12-y}$ , have been discovered as single crystals within this system. The composition of all phases was verified with powder and single crystal x-ray diffraction. Our group is currently investigating the growth of similar compounds using the methods developed for this system.

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