

Abstract Submitted  
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**Search for new phases in the Praseodymium-Silicon system<sup>1</sup>**

JOSE DE LA VENTA, ALI C. BASARAN, University of California San Diego, TED GRANT, University of California Irvine, J. GALLARDO-AMORES, Universidad Complutense, J.G. RAMIREZ, University of California San Diego, M.R. SUCHOMEL, Advanced Photon Source, Argonne National Laboratory, M.A. ALARIO-FRANCO, Universidad Complutense, ZACHARY FISK, University of California Irvine, IVAN K. SCHULLER, University of California San Diego — We searched for new superconducting and magnetic phases in the Pr-Si system using high-pressure high-temperature and conventional arc melting syntheses. High pressure synthesis is a unique technique which allows incorporation of elements into compounds which otherwise cannot be synthesized at ambient pressure Both high and low Si concentration areas of the phase diagram were explored. To investigate the high Si concentration compounds,  $\text{PrSi}_2$  with an excess of Si was subjected to HP-HT synthesis. To explore the high Pr concentration binary compound  $\text{Pr}_5\text{Si}_3$ , we have synthesized undoped  $\text{Pr}_5\text{Si}_3$  as well as different samples doped with C or B. High resolution X-ray powder diffraction, Magnetic Field Modulated Microwave Spectroscopy and magnetic characterization found that the addition of C gave rise to multiple previously-unknown ferromagnetic phases. Furthermore, X-ray refinement of the undoped samples confirmed the existence of the so far unconfirmed  $\text{Pr}_3\text{Si}_2$  phase.

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