Abstract Submitted
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**Phase Transitions and Melting in Magnesium to 200 GPa and 4500 K**[1] G. STINTON, The University of Edinburgh, Edinburgh, UK, S. MACLEOD, The Atomic Weapons Establishment, Aldermaston, UK, H. CYNN, Lawrence Livermore National Laboratory, Livermore, CA, USA, D. ERRANDONEA, Universitat de Valencia, Valencia, Spain, J. PROCTOR, The University of Edinburgh, Edinburgh, UK, Y. MENG, Geophysical Laboratory, Carnegie Institute of Washington, Washington D.C., USA, M. MCMAHON, The University of Edinburgh, Edinburgh, UK — Magnesium is a "simple" nearly free-electron metal up to around 100 GPa. Despite similarly-simple group II metals being the subject of numerous studies that have revealed complex high-pressure behaviour, Mg has very few high-pressure diffraction studies, particularly above room temperature. Here we describe such studies to above 200 GPa at 300 K, combined with resistive- and laser-heating experiments to 4500 K and 100 GPa. The hcp-bcc transition at ∼50 GPa exhibits a large region of phase co-existence at all temperatures up to 800 K, and the transition pressure is found to decrease with temperature at the rate of ∼3.4 GPa per 100 K, somewhat smaller than the rate calculated by Mehta *et al.*, [1]. At lower pressures, below the melting curve at 10 GPa, we find the dhcp phase to be stable, in agreement with Errandonea *et al.* [2]. Laser heating studies to 4500 K and 100 GPa show that Mg remains bcc up to the melting curve, our measurement of which is in good agreement with the previous "speckle" studies of Errandonea *et al.* [3]. [1] S. Mehta, *et al.*, J. Chem. Phys. 125, 194507 (2006). [2] D. Errandonea, *et al.*, J. Phys.: Condens. Matter 15 (2003) 1277–1289 [3] D. Errandonea, *et al.* Phys. Rev. B 65, 012108 (2001)

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