

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Sub-lattice melting in hydrogen-rich alloys SIMON GRAVEL, Cornell University, NEIL ASHCROFT — Hydrogen at low temperatures has recently been predicted to undergo a solid to quantum liquid transition at sufficiently high pressure. The resulting quantum liquid is believed to be a metal and exhibit both superfluidity and superconductivity. Pseudopotential methods combined with non-linear response theory have been able to give a simple, qualitative account for this transition. We generalize these methods and apply them to hydrogen-rich compounds in order to determine effective pair and triplet interactions in such alloys. By comparing the binding energies obtained to the proton or deuterium zero-point energy we can determine whether sub-lattice melting can be expected, and obtain an estimate of the required pressures.

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Date submitted: 01 Dec 2004

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