

Colloquium Notice

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Magnetic phase transition in FeRh: a combined approach using first-principles calculations and quantum field theoretical methods

Magnetic binary alloy, iron rhodium (FeRh), has attracted attention since 1938. It is known to exhibit a magnetic phase transition from a ferromagnetic to an antiferromagnetic state at 350 K. While its crystal structure remains unchanged at the transition, its volume undergoes a 1% increase. In this talk, we present our studies of several magnetic binary alloys related to FeRh: FePd, MnRh, MnPd, and FePt, using first-principles calculations based on the linear muffin-tin orbital approach. Our results, which agree with several experiments and calculations, suggest that our approach well describes the crystal and magnetic structures of these binary alloys in their ground states and the structures of the related pseudo-binary alloys. However, our treatment of the magnetic phase transition has thus far not incorporated the effects of temperature due to a limitation in our code. In order to take account of these thermal effects, we present an approach that combines first-principles and quantum field theoretical methods.

Monday
December 5, 2016
Starts at 12:15 PM
Coffee at 12:00 PM
Physics Conference Room, SB B326