

Seminar

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Electronic states in rare-earth and transition metal nitrides

-12.15pm-

-Tuesday 1st November-

-Rankin Brown 107, Victoria University of Wellington-

-Video Conference Room, C-Block, IRL, Gracefield Site, Lower Hutt-

-Level-3 lecture theatre (A309), ECE Dept Building, Canterbury University-

-Turitea R1.07, Massey University-

-Conference Room 2, Otago University-

One of the most fascinating aspects of the study of solids is the enormous range of electronic states that can result from seemingly minor variations in the arrangement of the constituent atoms. Among the possibilities are metals, semiconductors, insulators, superconductors, and magnetically ordered solids, all of which are utilised in electronic devices. In the continued drive to find new materials with useful properties much recent attention has been focussed on metal nitrides. Understanding the electronic states in these materials is an ongoing challenge for both theorists and experimentalists.

In this talk I will describe our study of transition metal and rare-earth nitrides, focussing on manganese nitride and gadolinium nitride. We have grown thin films of these materials and studied their properties with a range of techniques. For MnN I will present both optical and x-ray spectroscopy measurements that we have used to characterise the band structure of this anti-ferromagnetic material, and compare these to theoretical calculations. For GdN I will present evidence that the ground state is a ferromagnetic semiconductor, in contrast to some recent theoretical predictions and experimental observations.



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