

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

A Monte Carlo Study of Magnetically Frustrated Chromium¹ ANDREW MACDONALD, SARAH BURKE, DOUG BONN, YAN PENNEC, Univ British Columbia — As the thickness of engineered films decreases exotic magnetic configurations can appear because of boundary conditions, alloying, or metastable crystallographic phases. Characterizing the ground state of such films is imperative to building new and better magnetic devices and gaining a fundamental understanding of magnetic materials. Spin-polarized scanning tunnelling microscopy experiments have recently revealed unexpected types of magnetic order in a thin film of chromium grown epitaxially on gold. In this talk, I will discuss the characterization of the magnetic ground states of this film via classical Monte Carlo simulations. By modelling the film as an Ising system with a variable degree of lattice distortion and diluting with non-magnetic sites the simulations replicate the complexity of the magnetic ordering observed in the experimental data. Comparing the results of simulation and experiment we conclude that the observed magnetic order is a result of substantial gold inter-alloying combined with geometric frustration, making the ordered state highly sensitive to the degree of lattice distortion.

¹NSERC, Westgrid, Quantum Materials Institute

Andrew Macdonald
Univ British Columbia

Date submitted: 15 Nov 2013

Electronic form version 1.4