



IFMP Seminar

Date Monday, June 24, 2024, at 14:50

REC/C213

BigBlueButton: <https://bbb.tu-dresden.de/b/dar-mbs-me8-gsc>

Speaker **Harry Lane**

University of St. Andrews

Title **Excitations in systems with large unit cells: disorder, frustration, and noncollinearity**

Abstract The presence of frustrated interactions or low dimensionality can drive the formation of exotic phases of matter including correlated paramagnets, spin liquids and topologically nontrivial spin textures. The modelling of these phases can be challenging due to the often large size of the magnetic unit cell, which is infinite in the case that translational symmetry is completely broken. As a result, interpreting and fitting neutron scattering measurements to model Hamiltonians can be difficult. In this talk I will discuss recent theoretical work on modelling large magnetic unit cells with both linear spin wave theory and Landau-Lifshitz dynamics. In the first part, I will demonstrate that, for large unit cells, the computational complexity of linear spin wave theory can be improved significantly, allowing the realistic modelling of skyrmion crystals, incommensurate magnetic structures and disordered systems. In the second part, I will discuss recent results using Landau-Lifshitz dynamics to understand finite-temperature spin dynamics close to the magnetic ordering transition. I will argue that these calculations offer key insights into the magnetic fluctuations close to T_N and the mechanism underlying the magnetic phase transition in some real experimental systems.

Host: D. Peets