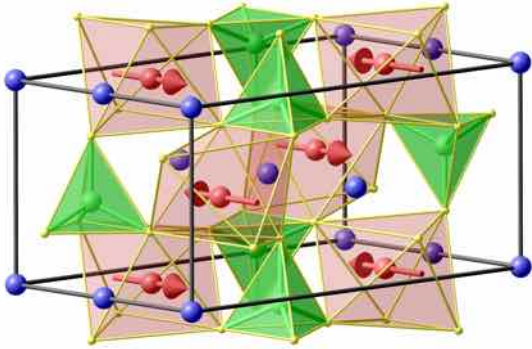


PhD thesis project

Tailoring the magnetoelectric ground states of lithium orthophosphates



Aims

The ambition of this project is to investigate the prospects of tailoring magnetoelectric ground states, by mixing ions with mismatched single ion anisotropies within the lithium orthophosphate class of isostructural magneto-electrics. It has been shown by non-linear optical methods that substitution of Fe^{2+} for Ni^{2+} in magnetoelectric LiNiPO_4 affects the magnetic ground state [Zimmermann *et al.*, Phys. Rev. B 88, 014420 (2013)], a result confirmed by our preliminary neutron diffraction studies. The first subproject focuses on expanding this preliminary work to the entire substitution series $\text{LiNi}_{1-x}\text{Fe}_x\text{PO}_4$ and aims to demonstrate control of magnetoelectricity.

A second, thematically related, subproject aims to demonstrate that Ni^{2+} substitution for Co^{2+} in LiCoPO_4 increases the collinear spin rotation away from the easy b -axis which is key to the appearance of ferrotoroidal moments.

Methods

In this project we will investigate both powder and single-crystal samples using a combination of bulk measurement techniques, unpolarised

neutron diffraction, spherical neutron polarimetry, neutron spectroscopy and Monte Carlo simulations.

You have a master or diploma in Physics or equivalent? You are interested in experimental work on material properties of the future? You are excited to work in an international environment at large-scale facilities?

Then this project could be interesting for you! Feel free to contact us for more information!

When: open now

Where: Technical University of Denmark & Institut Laue-Langevin

Duration: 3 years (1 in Copenhagen + 2 in Grenoble)

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