**Description:** The electronic and magnetic properties of transition metal oxides have been widely investigated as a result of the array of outstanding functional properties discovered. High temperature superconductivity (HTSC) in copper oxides and colossal magnetoresistances (CMR) in manganite perovskites are two particularly important phenomena that have been extensively studied. The recent report of high temperature superconductivity in oxyarsenides such as LnFeAsO1-xFx with superconducting transition temperatures (Tcs) up to 55 K has led to a rapid expansion in the research of oxypnictide materials. We have recently discovered a new mechanism of colossal magnetoresistance (CMR) in the Mn2+ analogue NdMnAsO1-xFx (x = 0.05-0.08). A negative magnetoresistant material exhibits a large reduction in electronic resistivity upon application of a magnetic field. Magnetoresistance, MR, is defined as MR = ((ρH-ρ0)/ρ0), where ρ0 and ρH are equal to the resistivity in zero and applied field respectively. Magnetoresistant materials are of technological importance and are applied in magnetoresistive sensors and spintronic devices.

In this PhD project the effect of anion doping (P3-‑ ↔ As3-) on the colossal magnetoresistance of NdMnAsO0.95F0.05 will be investigated. The synthesis of novel more complex Mn oxypnictides will also be performed with the aim of discovering new properties such as superconductivity and interesting magnetism. Materials will be synthesised via solid state chemistry and characterised by X-ray and neutron diffraction, SQUID magnetometry, (magneto)resistivity measurements, electron microscopy and thermal measurements.

This PhD project is co-financed by the University of Aberdeen and the Institut Laue-Langevin (ILL) based in Grenoble, France. The student will spend the first year at the University of Aberdeen synthesising and characterising the new compounds. The final two years at the ILL, performing neutron diffraction experiments and analysing the data.

**Supervisors:** Dr. Abbie Mclaughlin and Dr. Clemens Ritter

**Application details:** The deadline for the application is 9th June 2017. Formal applications can be completed online: http://www.abdn.ac.uk/postgraduate/apply. You should apply for Degree of Doctor of Philosophy in Chemistry, to ensure that your application is passed to the correct College for processing.

PLEASE ENSURE THAT YOU QUOTE THE PROJECT TITLE AND SUPERVISOR NAME ON THE APPLICATION FORM.   
Informal inquiries can be made to Dr A McLaughlin (a.c.mclaughlin@abdn.ac.uk) with a copy of your curriculum vitae and cover letter.

Applicants should have (or expect to obtain) at least the equivalent of a UK 2:1 honours degree in Chemistry or Physics. The studentship will cover tuition fees and an annual maintenance grant for 36 months. The position will start in September 2017.