The generation of high brilliance X-rays at synchrotrons is a uniquely placed tool for studying various catalytic systems. One such technique that harnesses the incredibly high photon flux on offer is X-ray absorption spectroscopy (XAS). XAS is a technique based on the photoelectric effect caused by the excitation of ground state electrons toward the continuum of an absorbing species. As the energy required to excite a photoelectron is intrinsically linked to the absorbing atom, XAS is used as an element specific technique.  
 Measuring the photoelectric effect as a function of energy, enables us to elucidate the average oxidation state and geometry (XANES), and local environment surrounding the absorbing element (EXAFS) (Figure 1). Furthermore, *in situ* or *operando* measurements can be performed, yielding time or spatially resolved data, improving our understanding of the fundamental processes that occur during synthesis, reaction and deactivation in laboratory or industrial scale systems.   
 In addition, I am researching the use of bifunctional catalysts for the hydroconversion of *n*-alkanes to value added isomerized derivatives. This research continuous on the works published by previous members of the MCC group: Zečević, Chang, and Smulders.[1-3] Here, they described preferential synthesis procedures to enhance the synergistic relationship of metal nanoparticles with the physically mixed metal oxide + zeolite supports they are impregnated onto. Crucially, the localisation of the metal nanoparticles away from the zeolite channels and pores is paramount in increasing isomer selectivity over the formation of cracked alkanes (typically C3-C4 chains).