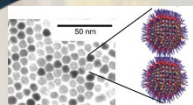
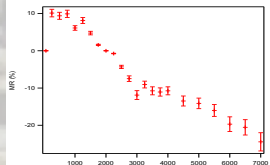


Inorganic Nanomaterials for Energy Applications

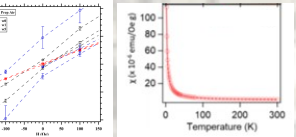
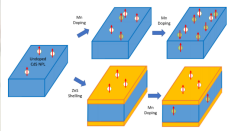
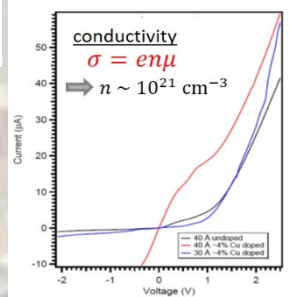
Robert W. Meulenberg, Associate Professor in Physics and FIRST



Magnetoresistance of iron oxide NC films



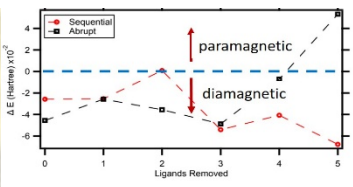
I-V curves of NC films



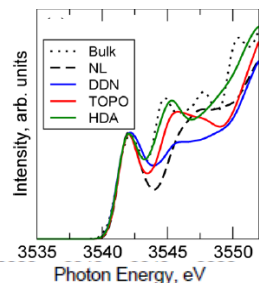
Z-STEM of magnetic nanocrystal

Dopants and surface engineering lead to novel magnetic properties

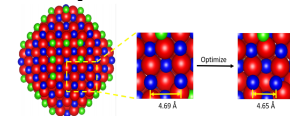
Favorability for unpaired spins in surface reconstructed CdSe



XANES theory: Effect of ligand



Migration of atoms during surface reconstruction



Realistic theoretical calculations to support experiment

Dictate film conductivity through dopant incorporation and particle separation

Conductive Nanocrystalline Solids

Magnetic Materials

NANOSTRUCTURED INORGANIC MATERIALS

Computational Materials Science

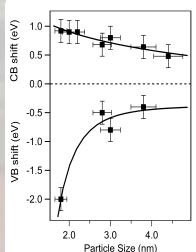
Typical Funding Support
NSF, DOE, National Labs

Synchrotron X-Ray Spectroscopy/Microscopy

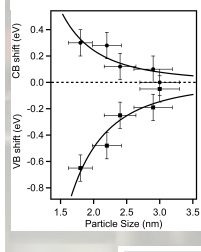
Batteries and Catalysts

Quantum Dots and Nanoparticles

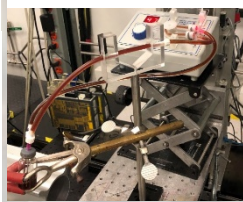
Band edge scaling in CdSe



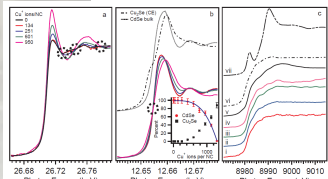
Band edge scaling in Si



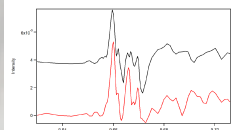
In situ XAS at Argonne



Probing cation exchange in CdSe

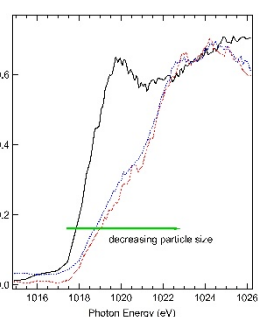


Transient XAS on ZnSe



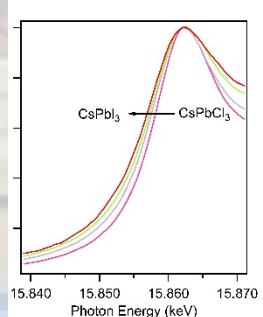
Metal oxides

ZnO Conduction band shift

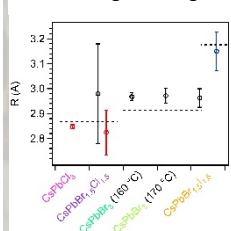


Inorganic Perovskites

Conduction band shift

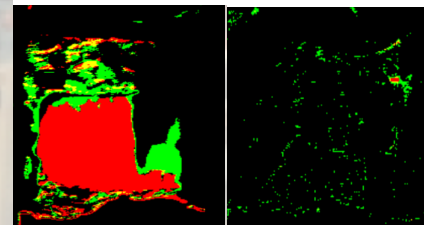


Bond length change



FeS2 thermal batteries

No external load 1 A/cm² load



Ru catalyst

