Fall 2018 Joint Colloquium
Materials Department & Materials Research Laboratory

Professor Patrick Woodward
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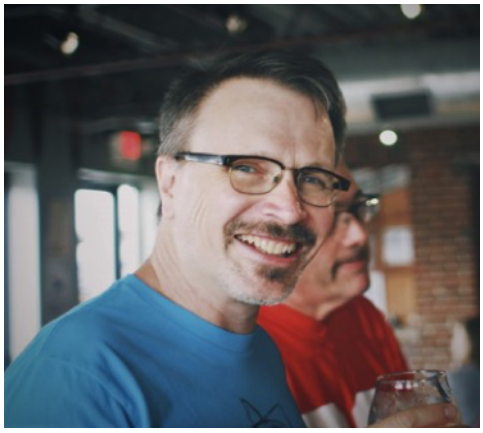
Ohio State University



Friday, November 9th, 2018
11:00 am, Elings 1601

The Magnetism of Double Perovskites Containing 5d Transition Metal Ions

The magnetism of oxides containing 5d transition metal ions differs from 3d transition metal oxides in several fundamental ways: (1) the 5d orbitals extend further from the nucleus which can lead to unexpectedly strong superexchange interactions, (2) for similar electron configurations the spin-orbit coupling of 5d ions is much stronger, and (3) competing magnetic ground states in 5d transition metal oxides are very sensitive to distortions of the lattice. In this talk I discuss our studies of the magnetic properties of $A_2MM'O_6$ double perovskites where M' is either osmium, rhenium, or iridium. I will begin with double perovskites where the 5d ion is the only magnetic ion in the structure. In the latter half of the talk, I will discuss double perovskites that contain both 3d and 5d ions. A common theme throughout is an extreme sensitivity to changes in the filling of d-orbitals and relatively subtle distortions of the lattice.

Bio

Patrick Woodward was an undergraduate student at Idaho State University, completing bachelors degrees in both Chemistry and General Engineering. He attended graduate school at Oregon State University where he worked on the synthesis and structure of double perovskites with Art Sleight. He received a MS in Materials Science and a PhD in Chemistry in 1996. After a two year postdoc in the Physics Department at Brookhaven National Laboratory where he studied powder diffraction with David Cox, he accepted a faculty position at Ohio State University in 1998. At Ohio State he has been recognized with an NSF Career Award, an Alfred P. Sloan Fellowship, and most recently as a Leverhulme Visiting Professor at Durham University in the UK. Woodward currently serves as an IRG co-leader in the OSU MRSEC, and Vice President of the Neutron Scattering Society of America.

https://research.cbc.osu.edu/woodward.55/

Hosted by Stephen Wilson.