



Joe Paddison

Eugene P. Wigner Fellow

Where and when did you earn your PhD?

I earned my PhD through a joint project of Oxford University and Britain's neutron source, the ISIS Neutron and Muon Source in Oxfordshire, England.

What was the subject of your dissertation?

My dissertation addressed computational techniques to predict 3D neutron scattering data from powder data.

What was your dissertation's major contribution to your field?

My work showed that unexpected amounts and types of information can be obtained from neutron scattering measurements.

Who is your ORNL mentor?

My mentor is Andy Christianson, a neutron scattering scientist in the Materials Science and Technology Division. I am working in the Materials Science and Technology Division, Physical Sciences Directorate.

What does your fellowship research focus on?

My work focuses on using neutron scattering techniques to develop a deeper understanding the behavior of magnetic materials such as quantum-spin liquids. I'm also exploring materials for which the effects of quantum mechanics and crystalline geometry coincide to create entangled states of matter driven by their magnetic moments.

What is your project's expected contribution to your field?

I hope to better understand collective quantum effects in magnets and their signatures in neutron scattering experiments.

What are your research interests?

My research interests lie at the intersection of neutron scattering, materials' structure, and models of materials' behavior.

What led you to science and your specific discipline?

My high school geometry classes inspired my love of shapes, which led to my interest in chemistry and investigating crystalline structures. My undergrad research experience introduced me to the joys of empirical study. My undergrad inorganic chemistry coursework taught me a lot about materials. I think of myself as a physicist given the time I've spent understanding materials with neutrons.

What did you do before coming to ORNL?

I've bounced back and forth between the United States and my home, the United Kingdom, over the past few years. After receiving my PhD, I did a postdoctoral fellowship at Georgia Tech that focused on neutron spectroscopy. Then I did a junior research fellowship in physics at the University of Cambridge before coming to Oak Ridge as a Wigner Fellow.

Could you share an interesting fact or two about yourself?

My main interest outside science is music. I played guitar in a funk band growing up in Britain. My favorites are Americana, alternative country, and blues in addition to funk, which is very fun to play.