



DEPARTMENT OF  
**PHYSICS & ASTRONOMY**  
**SPEAKER SERIES**

PRAIRIE UNIVERSITIES PHYSICS SEMINAR SERIES

*Resonant X-ray Studies of  
Quantum Materials at the  
Canadian Light Source*

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University of Saskatchewan



**Thurs, March 14**  
**1:40-2:55PM**  
**D632**

**Everyone welcome!**

The impact of materials science on society over the past century has been immense – as a key example, the development of quantum mechanics and band theory improved our understanding of semiconductors, leading to the invention of the solid state transistor. Today most people carry billions of transistors around with them everywhere they go, enabling uninterrupted access to global information and communication.

Now, a new generation of materials science is emerging in the form of “quantum materials”, and has the potential to again revolutionize electronic devices. Whereas electrons move around and scatter essentially independently of one another in conventional electronic materials, in quantum materials the electrons engage in highly correlated motions, leading to a wide range of fascinating and useful electronic and magnetic properties. However, as they are a realization of quantum many-body physics, these correlated properties can be very difficult to understand and control, from both theoretical and experimental viewpoints.

In this talk I will give a brief introduction to the field of quantum materials, and describe some of our recent experiments at the Canadian Light Source using advanced x-ray scattering techniques to help develop our understanding of various exciting quantum materials. By studying how finely tuned x-rays are reflected and diffracted from materials and interfaces, and using detailed quantum mechanical models to analyze the data, we can develop our understanding of the emergent properties of quantum materials and work toward the next generation of electronic and magnetic devices.

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