

Inorganic/TcSUH Seminar

Texas Center for Superconductivity at the University of Houston

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Merging Form and Function: Insights into Electronically and Magnetically Active Ceramics

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Room 102, University of Houston Science Center

11:00 a.m. – 12:00p.m.

Abstract

The power of periodic solids is their hybridization of vast arrays of atomic orbitals. This enables strong magnetism, excellent electronic conduction, and a host of intriguing collective phenomena which are generally absent in molecular compounds. The oxides of ruthenium are some of the most interesting transition metal oxides, as they can be very conductive (due to their extended 4d orbitals) while retaining strong magnetic interactions (which are rare outside of the 3d oxides). I will talk about the wide variety of properties observed for the ruthenates I have synthesized and studied, including geometric frustration, orbital ordering, and quantum ($T=0$) phase transitions. Some properties can be simply explained by a close look at crystal structures, while others need a detailed calculation of their electronic structures, and a few are pushing the envelope of the modern understanding of crystalline solids. I will discuss how a detailed understanding of and control over the energy levels of solids can offer promising solutions to the global need for clean energy.

Persons with disabilities who require special accommodations in attending this lecture should call (713) 743-8210 as soon as possible.



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