



PHYSICS AND ASTRONOMY SPECIAL COLLOQUIUM

Dr. Elizabeth Nowadnick

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“Structural complexity as a route to new ferroelectric and multiferroic oxides”

Abstract

"World-wide energy use by consumer electronics and data centers is rapidly increasing, creating a strong need for innovations that lower energy consumption. One path is based on multiferroics - materials that are both ferroelectric and ferromagnetic - which can enable electric field control of magnetic states in memory elements. However, there are few known multiferroic materials that operate at room temperature, motivating the exploration of new materials and mechanisms. In this seminar, I will discuss a recently discovered class of layered perovskite oxide ferroelectrics where couplings between subtle structural distortions offer new pathways to control the electronic and magnetic properties. In particular, I will use a combination of symmetry analysis and density functional theory calculations to understand the ferroic switching and domain structures of these materials, which are key for their functionality and performance. I also will highlight how combining these calculations with data from new nanoscale imaging techniques gives insight into the local structure and dynamics of these complex materials".

Wednesday, February 27, 2019

3:00 p.m.

Elliott Building – Room 230