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Prof. Jason Hoffman

Materials Science Division
Argonne National Laboratory

Tuning the Electronic and Magnetic Properties of Complex Oxides with Charge, Strain, and Light

Many complex oxide materials exhibit strong coupling between spin, charge, and lattice degrees of freedom, which gives rise to a tremendous diversity of functional properties, such as magnetism, ferroelectricity, and superconductivity. In some cases, this cross-coupling also leads to an enhanced susceptibility to perturbations. In this talk, I will describe several recent experiments on the use of electrostatic, mechanical, and optical excitations to modify the behavior of nanostructured complex oxide systems, including the formation of non-collinear magnetic structures in (La,Sr)MnO_3/$LaNiO_3$ superlattices, strain-based tuning of the Verwey transition in Fe_3O_4, and the nanosecond recovery dynamics of the charge-ordered state in (La,Sr)FeO_3.

Dr. Jason Hoffman received a BS in physics from The College of William and Mary in 2003 and a PhD degree in Engineering and Applied Science at Yale University in 2010. During his PhD study in the Department of Applied Physics at Yale University, he demonstrated the reversible modulation of magnetism using the ferroelectric field effect, and was awarded an IBM PhD Fellowship in 2007 for this work. Since 2010, he has been a postdoctoral fellow in the materials science division at Argonne National Laboratory, where he uses ozone-assisted molecular beam epitaxy to fabricate complex oxide thin films and superlattices.

Wednesday, April 2, 4:00 pm
Room 136 Jorgensen Hall

Host:
Prof. Xia Hong
Department of Physics

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