

**Michigan State University**  
**Science at the Edge**  
***Engineering Seminar***

**December 5<sup>th</sup>, 2014**

11:30 a.m., Room 1400 Biomedical and Physical Sciences Building  
Refreshments served at 11:15 a.m.

**Darrell Schlom**  
Materials Science and Engineering  
Cornell University

***Playing the “Strain Game” to Enhance the Properties of Oxides***

Abstract

Using epitaxy and the misfit strain imposed by an underlying substrate, it is possible to strain oxide thin films to percent levels—far beyond where they would crack or plastically deform in bulk. Under such strains, the properties of oxides can be dramatically altered. For example, materials that are not ferroelectric or ferromagnetic in their unstrained state can be transmuted into ferroelectrics, ferromagnets, or materials that are both at the same time. Results of fundamental scientific importance as well as revealing the tremendous potential of utilizing multicomponent oxide thin films to create devices with enhanced performance will be shown.

Bio

*Darrell Schlom is the Herbert Fisk Johnson Professor of Industrial Chemistry and Head of the Department of Materials Science and Engineering at Cornell University. After receiving a B.S. degree from Caltech, he did graduate work at Stanford University receiving an M.S. in Electrical Engineering and a Ph.D. in Materials Science and Engineering. He was then a post-doc at IBM’s research lab in Zurich, Switzerland in the oxide superconductors and novel materials group managed by Nobel Prize winners J. Georg Bednorz and K. Alex Müller. He has received various awards including young investigator awards from the National Science Foundation and the Office of Naval Research, an Alexander von Humboldt Research Fellowship, and the MRS Medal. He is a Fellow of both the American Physical Society and the Materials Research Society.*

For further information please contact Prof. Richard Lunt, Department of Chemical Engineering and Materials Science at  
rlunt@msu.edu

*Persons with disabilities have the right to request and receive reasonable accommodation. Please call the Department of Chemical Engineering and Materials Science at 355-5135 at least one day prior to the seminar; requests received after this date will be met when possible.*