

## Department of Physics & Astronomy

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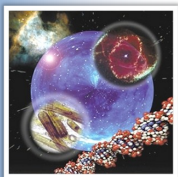
Friday, Feb, 24 2012

Time: 3:15 p.m. -4:15 p.m.

BB 3.04.18

### **Analyses of the Ferroelectric Polarization Induced by Magnetic Order**

The multiferroic phenomena of various transition-metal oxides, induced by their chiral magnetic orders, are analyzed by evaluating their spin exchange interactions and calculating the ferroelectric polarizations for their ordered spin states on the basis of DFT calculations. We probe how the ordered chiral spin arrangements and the ferroelectric polarizations of these compounds are related to their geometric spin frustration and spin-orbit coupling, and discuss the nature of the magnetic structure change needed to take place in reversing the polarization direction when the applied electric field direction is reversed. Finally, we present a general theory of the ferroelectric polarization induced by chiral magnetic order.



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