

Materials Science and Technology Division

“Phase Diagrams of the Multiferroic Perovskite Manganites”

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Wednesday, August 5, 2009

11:00 a.m.

HTML/4515, Room 265

Abstract

Perovskite manganites RMnO_3 exhibit a variety of magnetic and electric phases including multiferroic phases and fascinating magnetoelectric phenomena. We theoretically study the phase diagram of RMnO_3 by constructing a microscopic spin model, which includes not only the superexchange interaction but also the single-ion anisotropy and the Dzyaloshinsky-Moriya interaction. Analysis of this model using the Monte-Carlo method reproduces the experimental phase diagrams as functions of the R-ion radius and temperature, which contain two different multiferroic states, i.e. the ab-plane spin cycloid with ferroelectric polarization $P//a$, the bc-plane spin cycloid with $P//c$, and the E-type phase. We also discuss the sinusoidal collinear spin state at high temperature.

Host: Satoshi Okamoto

*Note: There will be an additional information seminar by Prof. Furukawa to be held **Tuesday, August 4, in 4515, Room 114, at 2:00 p.m.** His talk will be, “Theory of electric field induced one-magnon resonance in cycloidal spin magnets.”*