

Subject: MSD Colloquium, Wang, Thurs, 4/12, 11am, 212, A-157
From: Suzanne Kokosz <kokosz@anl.gov>
Date: Thu, 22 Mar 2007 11:00:09 -0500
To: Materials Science Division <msd@anl.gov>

SPEAKER: Ruey-Ven Wang
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TITLE: Chemical Control of Polarization in
Ultrathin PbTiO₃ Films

DATE: Thursday, April 12, 2007

TIME: 11:00 a.m.

PLACE: Building 212, Room A157

HOST: Paul Fuoss

Refreshments will be available at 10:45 a.m.

Abstract:

The reorientable spontaneous electric polarization of ferroelectric materials gives them unusual dielectric properties and utility for information storage. Polarization orientation is typically switched by applying a voltage across electrodes. In this talk, I will discuss real-time synchrotron x-ray scattering experiments showing that the polarization can also be reversibly switched by changing the chemical environment in contact with one surface of a ferroelectric film. Oxidizing or reducing conditions induce outward or inward polarization, respectively, in a PbTiO₃ film. We found that the PbTiO₃ strain as a function of pO₂ obeys a classic "butterfly loop"². A new surface reconstruction was observed under reducing conditions.