



ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

# *PHYSICS COLLOQUIUM*

Thursday, 14 October 2010  
17:00-18:00

3<sup>rd</sup> Floor Seminar Room

## ***"Probing Chirality in Multiferroic Manganite Perovskites"***

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### ABSTRACT:

The structure and dynamics of domains and domain walls are at the heart of any device that utilizes the properties of a ferroic material. Magneto-electric (multiferroic), materials exhibit a strong coupling between ferroelectric and magnetic order, offer the possibility of rich and complex domain arrangement that can be exploited for spintronics and magneto-electric devices. Due to the complex magnetic order that is found in multiferroics, imaging of domains of a composite ferroic nature is challenging. In perovskite manganites such as  $RE\text{MnO}_3$  (RE=rare earth) a magneto-electric coupling results from a cycloidal Mn magnetic order. Such order can have opposite chirality which results in ferroelectric polarization of opposite sign. Using soft X-ray scattering methods we have developed a means to probe the chirality of the magnetic order on the surface of cleaved single crystals. We are able to imprint locally domain boundaries and subsequently read them in terms of their spin chirality. The method we describe here provides for a novel approach to probe complex domains in chiral magneto electric materials.