

SEMINARIO

Instituto Nicolás Cabrera

Día: *Miércoles, 14 de diciembre de 2016*

Hora: 12h30

Lugar: Facultad Ciencias, Módulo 03, Planta 5, Sala Seminario

Programa:

Presentación a cargo de Juan Gabriel Ramirez , Department of Physics, Universidad de los Andes

Título: *Controlling magnetization dynamics in heterostructures with first-order phase transitions*

Abstract: Control of magnetism dynamics (resonance field and linewidth) via proximity effects in hybrid materials is an ongoing challenge that, if successful, will have multiple technological implications. This is due to that the properties of each material inside the hybrid may be radically modified or occasionally a completely new material may emerge. One suitable approach to this idea is to employ materials that undergo first-order structural phase transitions (SPT) in order to control via inverse magnetoelastic effect the ferromagnetic film under contact [1,2]. I will show that, by doing so, we produce a drastic modification of the magnetization dynamics of thin Nickel films caused by the SPT of V2O3 in Ni/V2O3 hybrids [3]. Furthermore, ferromagnetic resonance (FMR) measurements across the SPT show diverse features that cannot be interpreted solely by magneto-elastic effects and that arise from the fact that first order phase transitions are inherently inhomogeneous showing phase coexistence [4] and that their length scales compete with those in the ferromagnetic material giving rise to a complex interplay. These results highlight the strong coupling of the lattice dynamics of a complex oxide to the magnon spectra of a ferromagnet in proximity, and suggest the existence of similar effects in other hybrid materials with structural phase transitions.

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- [1] J. de la venta et al., Applied Physics Letters 104, 062410 (2014).
- [2] T. Saerbeck et al., Journal of Materials Research 29, 2353 (2014).
- [3] J. G. Ramírez et al., Physical Review B 93, 214113 (2016).
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