

# Salvador Velayos Award 2025





# UNIVERSITAT DE BARCELONA



## FORMACION ACADEMICA

### LICENCIATURA EN CIENCIAS FISICAS:

UNIVERSIDAD DE BARCELONA. (OCTUBRE 1979-JUNIO 1984).

### TESINA DE LICENCIATURA:

UNIVERSIDAD DE BARCELONA. (DICIEMBRE 1984).

DEPARTAMENTO DE FISICA ATOMICA Y NUCLEAR.

DIRECCION: DR. J. TEJADA, DR. X. OBRADORS

TITULO: TEXTURA EN CINTAS MAGNETICAS, ESTUDIO

MEDIANTE TECNICAS MACRO Y MICROSCOPICAS.

CALIFICACION GLOBAL: SOBRESALIENTE.

### TESIS DOCTORAL:

UNIVERSIDAD DE BARCELONA. (MAYO 1989)

DEPARTAMENTO DE FISICA FUNDAMENTAL.

DIRECCION: DR. J. TEJADA.

TITULO: PROPIEDADES MAGNETICAS DE MULTICAPAS

METAL DE TRANSICION-METALOIDE-TIERRA RARA.

CALIFICACION: APTO "CUM LAUDE".





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E - 08028 BARCELONA  
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Telf. (93) 330 73 11

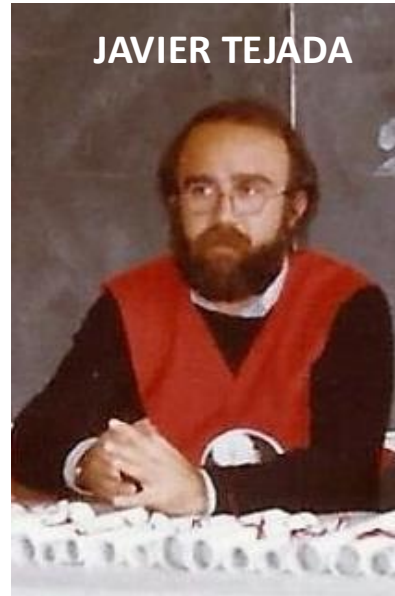
DEPARTAMENT DE FÍSICA FONDAMENTAL  
FACULTAT DE FÍSICA  
UNIVERSITAT DE BARCELONA

TESIS PRESENTADA  
EN LA UNIVERSIDAD DE BARCELONA  
FACULTAD DE CIENCIAS FÍSICAS  
PARA OPTAR AL GRADO DE  
DOCTOR EN CIENCIAS FÍSICAS

PROPIEDADES MAGNÉTICAS DE MULTICAPAS

METAL DE TRANSICIÓN - METALOIDE - TIERRA RARA

BENJAMIN MARTINEZ PEREA  
BARCELONA, 17 DE ABRIL DE 1989



### **TESINA DE LICENCIATURA: (1984-85)**

(2 artículos)

**Textura en cintas magnéticas. Estudio mediante técnicas macro y microscópicas**

### **TESIS DOCTORAL: (1985-89)**

(12 artículos)

**Propiedades magnéticas de multicapas Metal de Transición – Metaloides- Tierra Rara**

Excitaciones magnéticas colectivas en superredes

Multicapas  $\text{Fe}_{1-x}\text{Si}_x/\text{Si}$   $\text{Nd}_{26}\text{Fe}_{68}\text{B}_6/\text{FeB}_8$   $\text{Nb}/\text{Ni}$

- University of Colorado (Prof. R. E. Camley, (2 papers))
- Johns Hopkins University (Prof. J.C. Walker and Prof. C.L. Chien)
- University of Illinois and (Prof. M. B. Salamon)

(Dimensional Crossover of the spin-glass transition in thin Cu-Mn multilayers)

## Random anisotropy in amorphous alloys

$\text{Fe}_{80}\text{B}_{20}$ ,  $\text{Dy}_6\text{Fe}_{74}\text{B}_{20}$  alloys

J. Tejada and A. Labarta (UB)

M. Vazquez and A. Hernando (UCM)

E.M. Chudnovsky. (CUNY)

### RANDOM ANISOTROPY

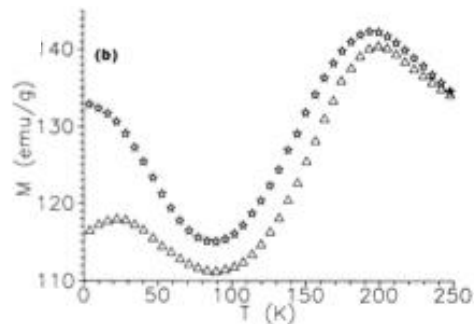
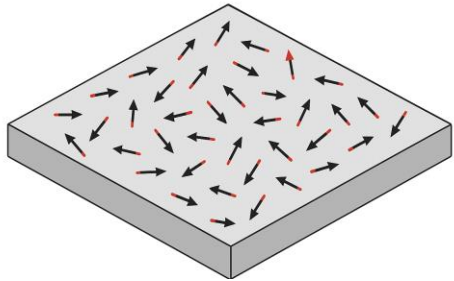
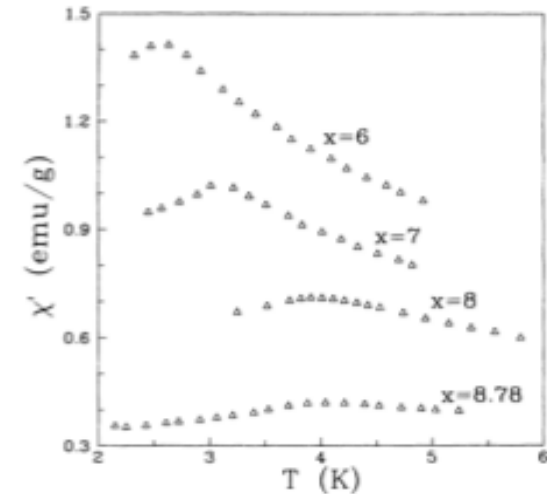
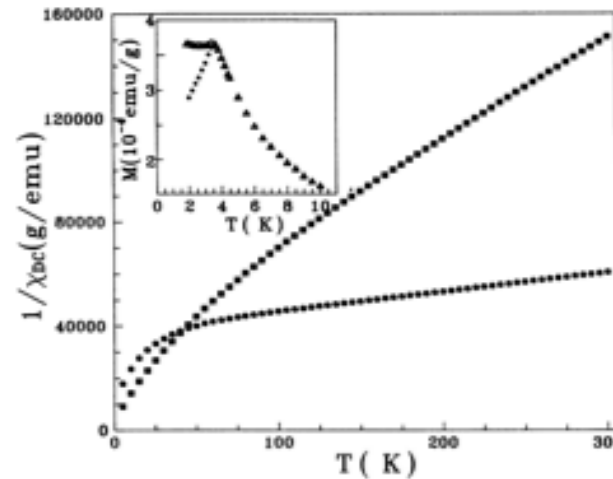
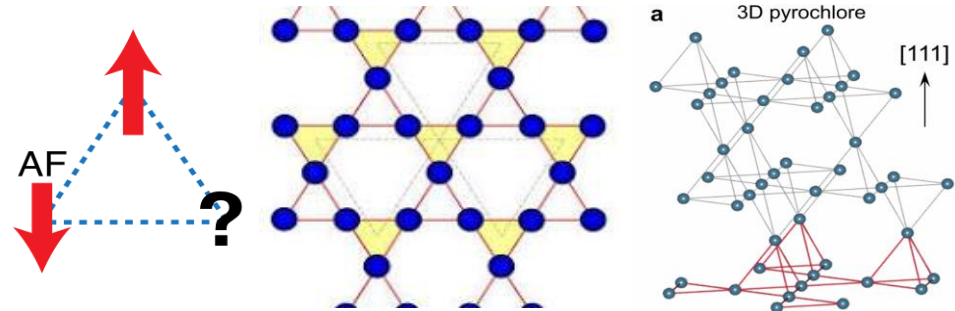


FIG. 5. Low-field magnetization curves obtained in a ZFC-FC process for Nd and Ce samples: (a) Ce [  $\diamond$  (F.C.);  $\triangle$  (ZFC)]; (b) Nd [  $\star$  (FC);  $\triangle$  (ZFC)].

## Magnetic frustration and disordered systems

A. Labarta (UB) and X. Obradors (ICMAB)

Study of the freezing transition in systems with geometrical frustration ( $\text{FeSbO}_4$ ,  $\text{SrCr}_8\text{Ga}_4\text{O}_{19}$ ,  $\text{BaCo}_6\text{Ti}_6\text{O}_{19}$ ).



1990 Científico Titular. ICMAB-CSIC

Department of Magnetic and Superconducting Materials at ICMAB



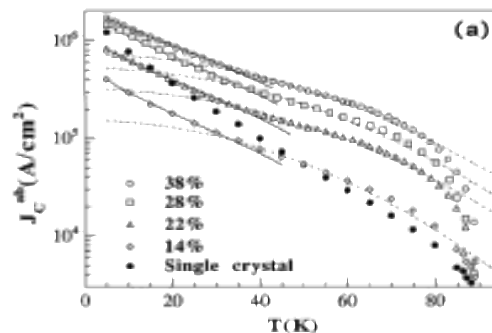
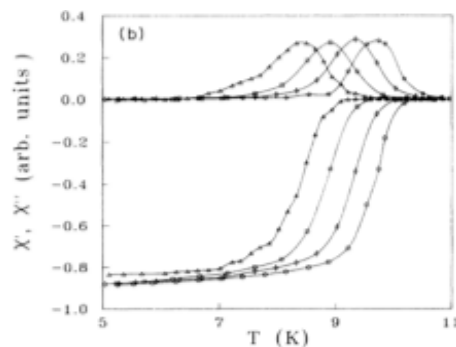
- Basic properties in electronic superconductors  $\text{Pr}_{2-x}\text{Ce}_x\text{CuO}_4$  single crystal (Tesis de L. Fábrega)

- High temperature superconductors:  $\text{YBa}_2\text{Cu}_3\text{O}_7$

- TRIUMF - U. of British Columbia

- Centro Atómico Bariloche-Instituto Balseiro

(Tesis: Anisotropía magnética en superconductores de alta  $T_c$ . Anna Gou)



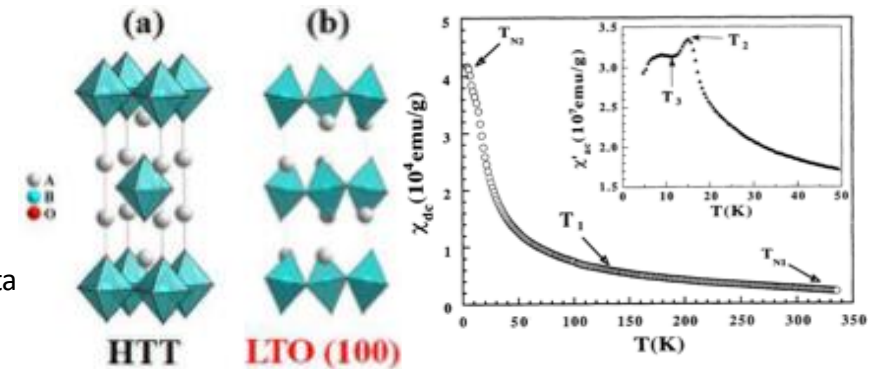
L. Fábrega J. Fontcuberta



S. Piñol. X. Obradors

Complex oxides:

$\text{Nd}_2\text{NiO}_4$  and  $\text{Pr}_2\text{NiO}_4$



X. Batlle



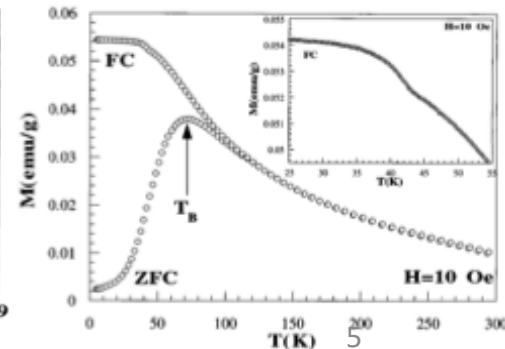
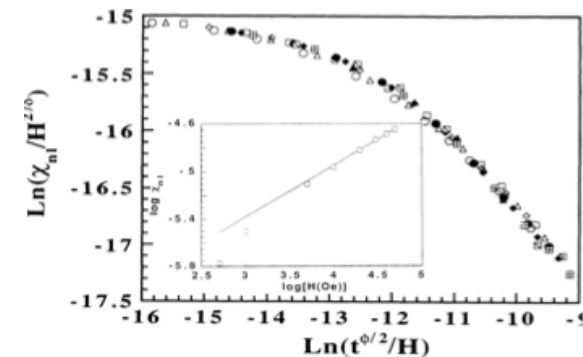
J. Rodríguez



A. Labarta

$\text{BaFe}_{4-2x}\text{Sn}_{2+x}\text{Co}_x\text{O}_{11}$  and  $\text{SrGa}_{12-x}\text{Cr}_x\text{O}_{19}$

$\gamma\text{-Fe}_2\text{O}_3$



## ICMAB-CSIC

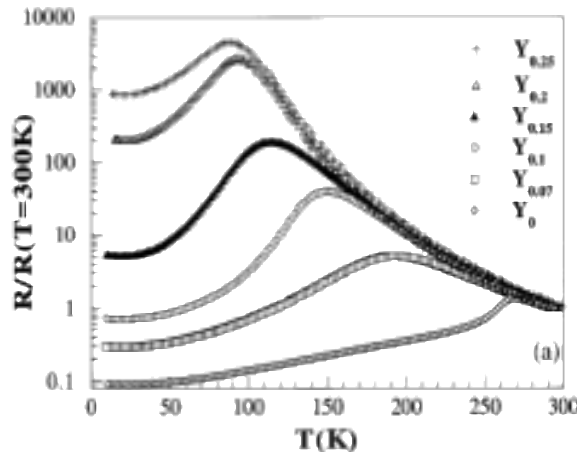
### Department of Magnetic and Superconducting Materials at ICMAB

Advent of the colossal magnetoresistance (CMR):

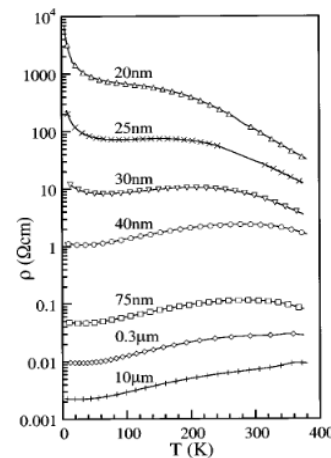
- Perovskite manganites  $\text{La}_{1-x}\text{A}_x\text{MnO}_3$  (Sr, Ca) and other TMOs
- Spin dependent transport phenomena
- Thin film preparation and characterization techniques



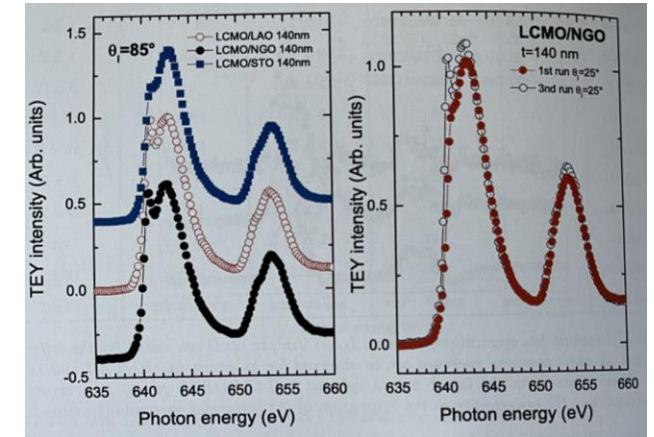
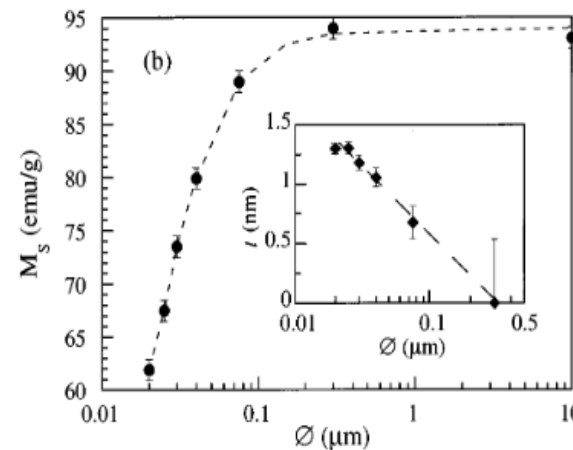
X. Obradors J. Fontcuberta



CMR response of  $\text{L}_{1-x}\text{Ca}_x\text{MnO}_3$



High-field magnetoresistance at interfaces in manganese perovskites



$\text{Mn}^{2+}$  formation. A time dependent process

Magnetoresistencia en óxidos: Mecanismos básicos y desarrollo de dispositivos.

Organismo financiador: CICYT. (MAT97-0699)

Período: 1997-2000

Investigador principal: **B. Martínez** Dotación total: 27.730.000 ptas.

Tesis doctoral: Magnetoresistencia colosal en perovskitas y pirocloros de manganeso

Doctorando: Raphael Senis. Julio 2001

Tesis doctoral: Element-selective study of charge localization processes in manganite thin films

Doctorando: Sergio Valencia. Diciembre 2006 (BESSY Synchrotron)



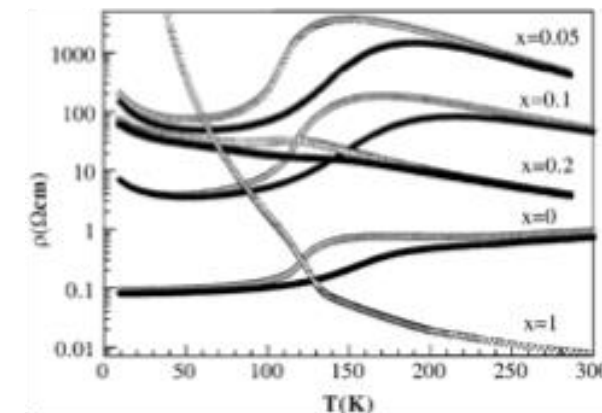
Ll. Balcells



C. Frontera



S. Valencia



$\text{Tl}_2\text{Mn}_{2-x}\text{Ru}_x\text{O}_7$  Pyrochlores

## ICMAB-CSIC

### Department of Magnetic Materials at ICMAB

#### Grupo de Caracterización Avanzada y Nanoestructuración de materiales

- CMR materials covering basic aspects, such as nature of the magnetic interactions, intrinsic and extrinsic MR, charge ordering, pressure effects, etc.
- Spin dependent phenomena. Spin filters and magnetic tunneling junctions.
- High quality TMOs thin films and heterostructures
- Spintronics: Generation and detection of pure spin currents  
Spin-Charge interconversion processes



A. Pomar



Ll. Balcells



C. Frontera



B. Martinez



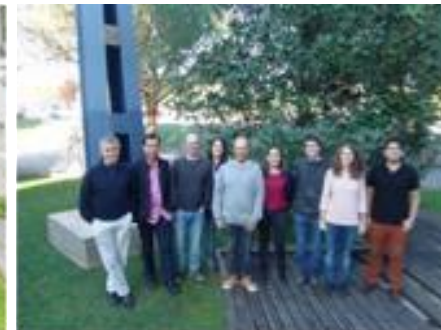
N. Mestres



B. Bozzo



Z. Konstantinovic



- **CMR materials covering basic aspects, such as nature of the magnetic interactions, intrinsic and extrinsic MR, charge ordering, pressure effects, etc.**

Tesis Doctoral: “Efectos estructurales y de interfase en capas finas de  $\text{La}_{2/3}\text{Ca}_{1/3}\text{MnO}_3$ ”

Doctorando: Libertad Abad. (Abril 2007)

Tesis Doctoral: “Sistemas nanoestructurados y propiedades de transporte en capas delgadas de manganita”

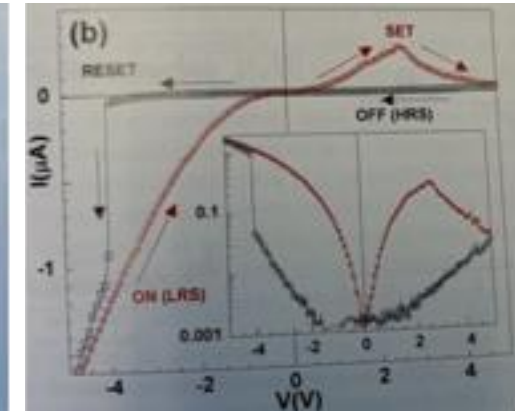
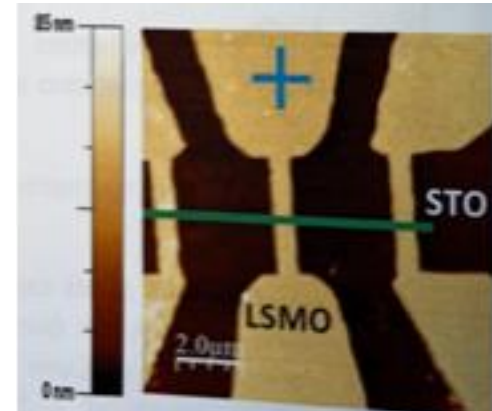
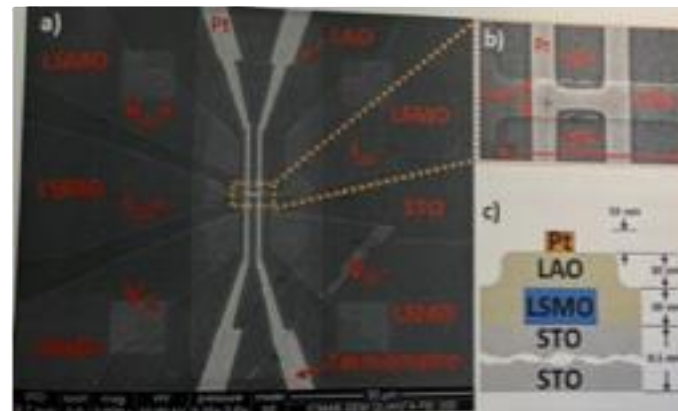
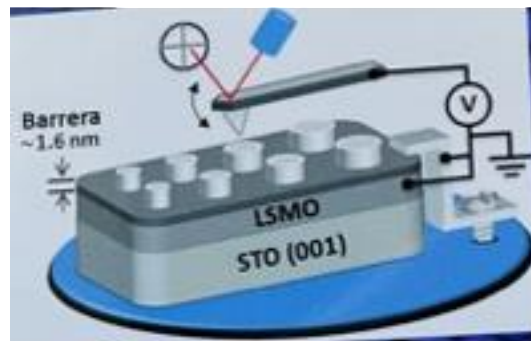
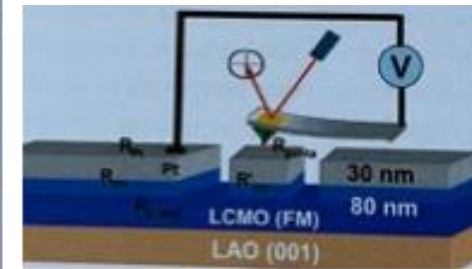
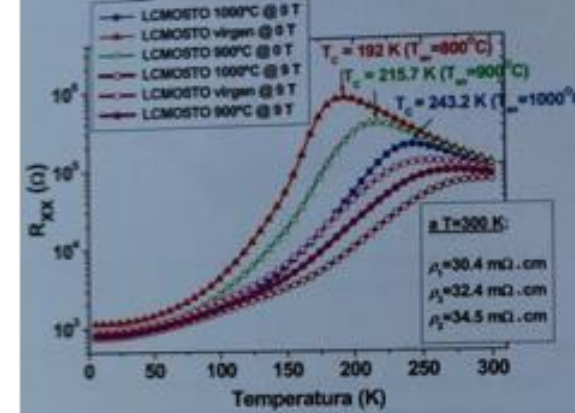
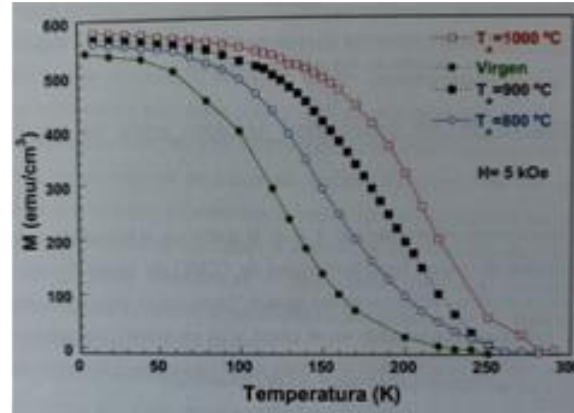
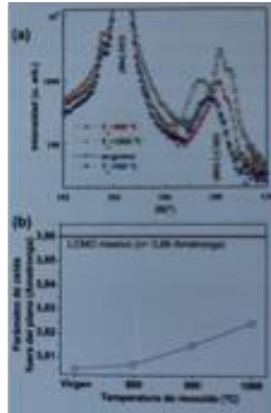
Doctorando: Luís Peña Guédez (Abril 2014)



L. Abad



L. Peña



## - Spin dependent phenomena. Spin filters and magnetic tunneling junctions.

Tesis Doctoral: Spin-dependent transport in oxide-based tunnel junctions

Doctorando: Regina Galceran Vercher (Febrero 2015)

Tesis Doctoral: Transport phenomena and magnetism in nanostructures of lanthanum manganite-based oxide thin films

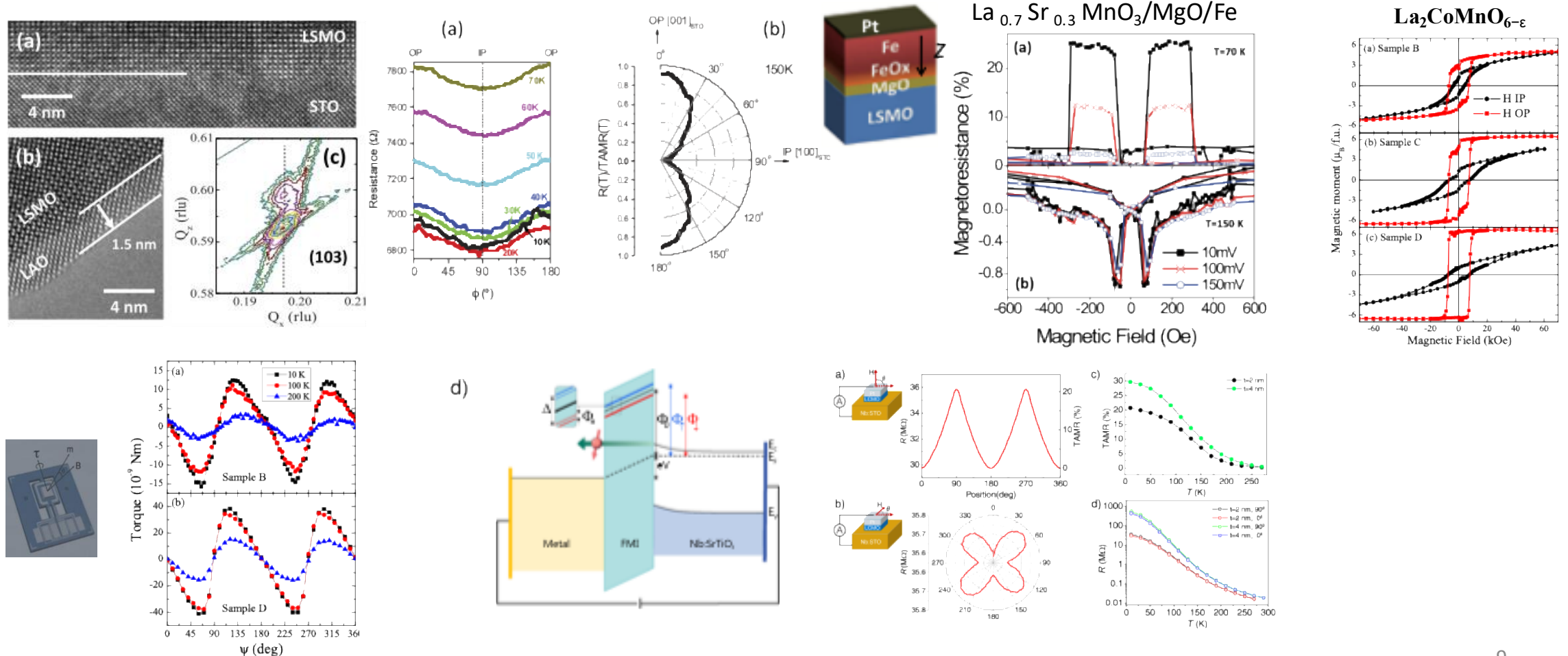
Doctorando: Laura López Mir (February 2018)



R. Galceran



L. López



## - TMOs thin films and heterostructures

Tesis Doctoral: Epitaxial growth of complex functional oxide thin films by green and sustainable chemical solution methods

Doctorando: Hailin Wang

Tesis Doctoral: Resistive Switching in Strontium Iridates

Doctorando: Victor Fuentes

Tesis Doctoral: Ferromagnetic insulator thin films based on ni/mn double perovskites

Doctorando: Mónica Emperatriz Bernal Salamanca



H. Wang

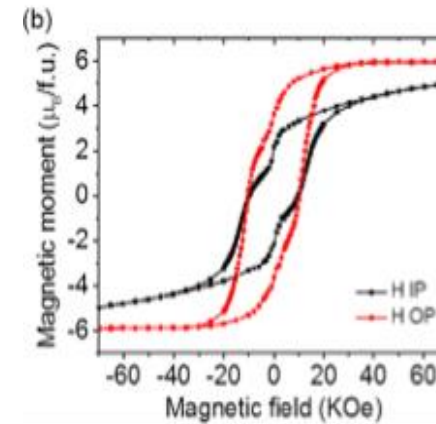
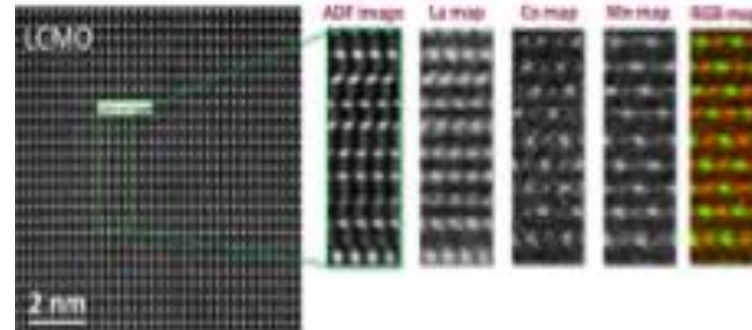


V. Fuentes

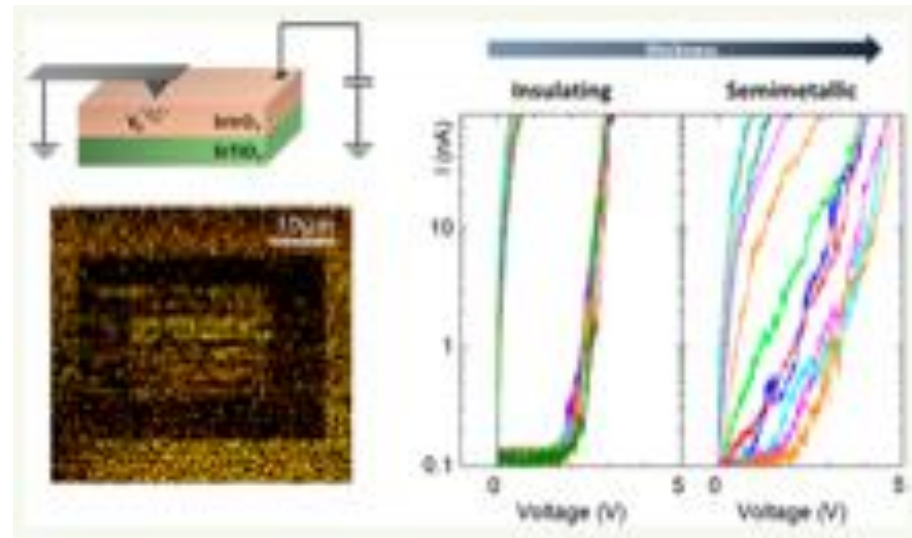


M. E. Bernal

### Preparation of $R_2NiMnO_6$



### Cationic ordering in chemical-solution-grown $La_2CoMnO_6$



### Resistive Switching in Semimetallic $SrIrO_3$ Thin Films

- Spintronics: Generation and detection of pure spin currents

Spin-Charge interconversion processes

Tesis Doctoral: Complex Oxide Heterostructures for Spin Electronics

Doctorando: Sergi Martín Río

Tesis Doctoral: Epitaxial growth and complex oxide thin films and heterostructures for the next generation of spintronic devices

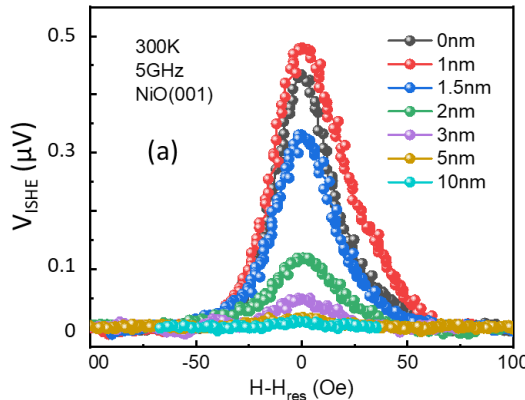
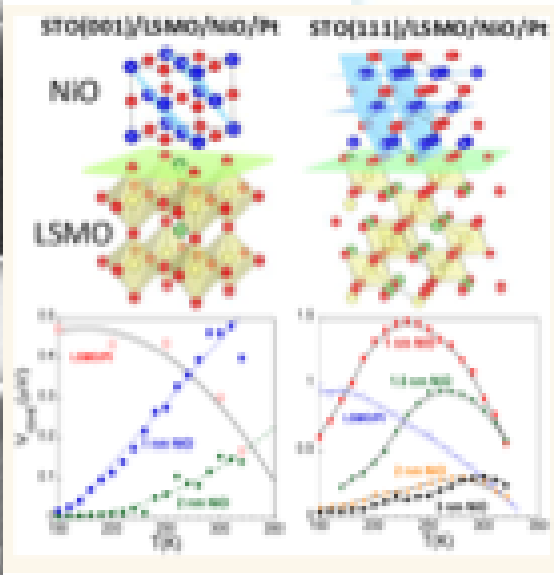
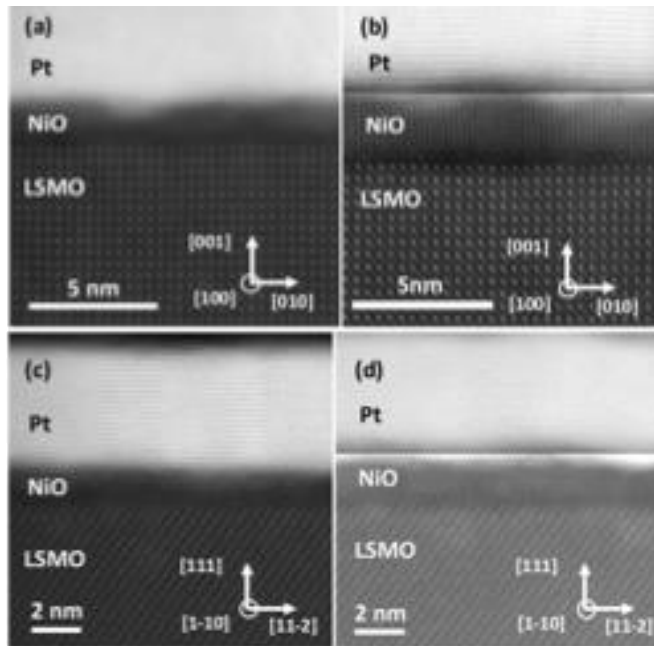
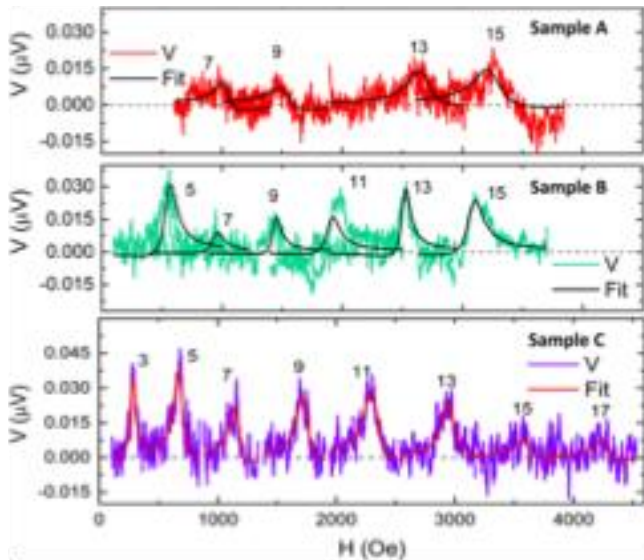
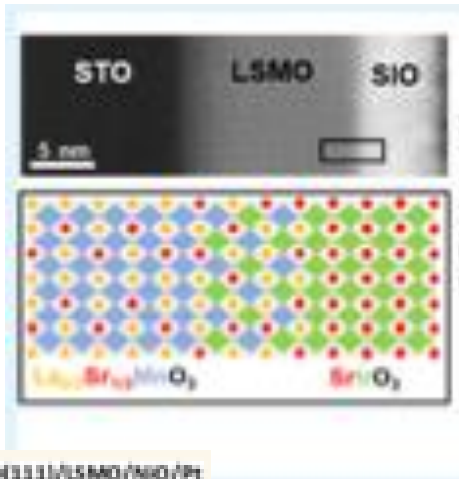
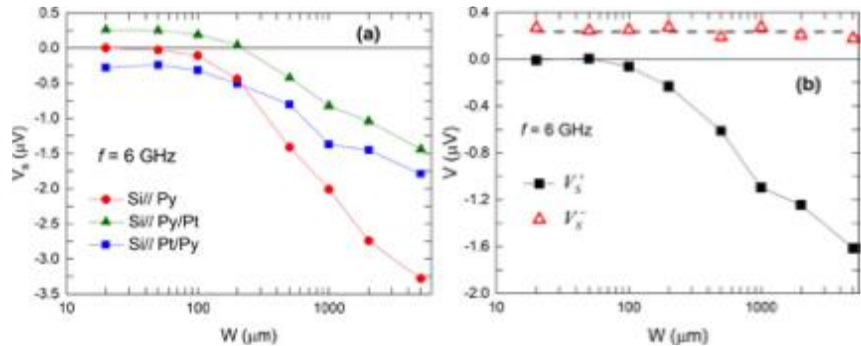
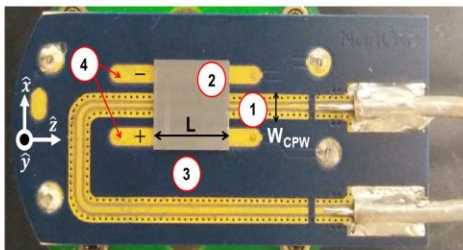
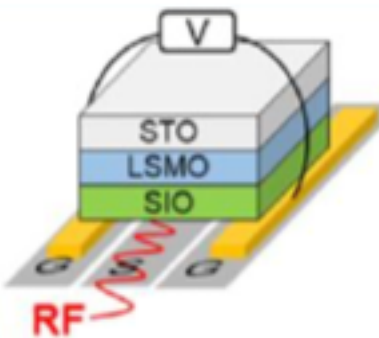
Doctorando: Shoulong Chen



S. Martín



S. Chen



## Teaching:

- **Profesor Asociado Tipo 1.** (1998-2004.) Ingeniería de Materiales. (UPC)  
Depto. de Ciencia de Materiales e Ingeniería Metalúrgica. ETSIIB.  
Asignaturas: Materiales Funcionales II. Propiedades Magnéticas y Ópticas de materiales
- **Programas de Doctorado y Master de la UAB** (1997-2009)

## Participation in international committees and representations:

- Miembro del Steering Committee del European Network on Highly Frustrated Magnetism (HFM). European Science Foundation (2005-2010)
- Miembro de la junta directiva del Club Español de Magnetismo (2007- 2011)
- Vicepresidente del Club Español de Magnetismo (2012- 2014)
- Presidente del Club Español de Magnetismo (2014- 2016)
- Secretario del Spanish Chapter de la IEEE Magnetic Society (2010 - 2011)
- Miembro de la Comisión de Doctorado de la Universitat Politècnica de Catalunya (UPC)
- Programa de Doctorat “Física Computacional i Aplicada” Cursos 2011 - 2012 y 2012 -2013

## R&D management:

- Adjunto de la Comisión de Ciencia y Tecnología de Materiales de la Agencia Nacional de Evaluación y Prospectiva (ANEP). (2010 – 2013)
- Gestor del Plan Nacional de Ciencia y Tecnología de Materiales. Agencia Estatal de Investigación – MINECO. (Julio 2015 – Julio 2018)



Thank you!

