

NANOSELECT NOE ANNUAL MEETING

MINECO (MAT2015-68994-REDC)
<http://projects.icmab.es/nanoselect>

8-10 JUNE 2016



Sant Feliu de Guixols, Catalunya, Spain,
Hotel Edén Roc, C/ Punta Port Salvi s/n





SUMMARY:

The Network of Excellence (NOE) NANOSELECT is a natural continuation of the corresponding Consolider Project (Advanced materials and NANOTEchnologies for innovative electrical, ELECTronic and magneto-electronic devices) which was focused in Functional Oxide Materials. The project, as it's clearly indicated by the corresponding indicators, was extremely successful: one of the achievements was to settle a powerful ensemble of Scientific Platforms, at the same time that it contributed to reach an extensive and efficient collaborative network among Research Groups with complementary profiles in related fields, around Functional Oxides, and so a strong synergy was generated. The present proposed action has as its main objective to profit of the previous effort investing now in keeping in place a set of networking activities while at the same time we further promote the international identification of NANOSELECT as a reference, a distinction which became a hallmark of the project. The new NOE proposal has established novel and attractive scientific objectives in domains having a large societal and economic impact: energy, electronics and nanomedicine. The scientific objectives are linked to the following topics: 1/ Energy: Superconducting materials for power applications; Oxides for photovoltaic generation; 2/ Oxide electronics: Towards energy efficient spintronic devices; Integration of functional oxides on Silicon; Plasmonics in hybrid ferroic systems; 3/ Nanomedicine: Oxide nanoparticles for therapy and diagnosis; Oxide nanoparticles anchored in biocompatible scaffolds for tissue regeneration.

The scheduled actions in the context of the NOE NANOSELECT are focused in facilitating the continuation of a high degree of collaboration between the 9 Research Groups of 5 different centers:

ICMAB-CSIC:	Superconducting Materials and Large Scale Nanostructuration Magnetic Materials and their Applications Advanced Characterisation and Nanostructuration of Magnetic Materials X Ray, Diffraction, Crystallography and Solid State Chemistry Theory and Material Simulation
ICMM-CSIC:	Structure of Nanometric Systems
CNM-IMB-CSIC:	Nanotechnology
UB:	Thin Film Structures for Spintronics
UAB:	Superconductivity



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SCIENTIFIC PROGRAM



8th JUNE

Time	Title	Speaker
	ARRIVAL OF PARTICIPANTS	
13:00 – 15:00	LUNCH TIME	
Chair: Prof. M. Teresa PUIG		
15:00 – 15:10	Welcome	XAVIER OBRADORS
15:10 – 15:55	Uncovering nanoscale redox-reactions during the operation of complex oxide memristive devices	REGINA DITTMANN
15:55 – 16:15	Emerging dilute ferromagnetism in high-Tc superconductors driven by point defect clusters	JAUME GÁZQUEZ
16:15 – 16:35	Volume resistive switching in functional oxides driven by the metal-insulator transition	JUAN CARLOS GONZÁLEZ
16:35 – 16:55	CSD YBCO nanocomposites: where nanostrain enhances vortex pinning	FERRÀN VALLÉS
16:55 – 17:25	Coffee-Break	
Chair: Prof. Carmen OCAL		
17:25 – 17:45	NANOCOSMOS Project	JOSÉ ÁNGEL MARTÍN-GAGO
17:45 – 18:10	In-situ Optical Imaging of Magnetoelastic Coupling	BLAI CASALS
18:10 – 18:30	A cluster source for fabricating nanoparticles	LÍDIA MARTÍNEZ
18:30 – 18:50	Understanding magnetic hysteresis loops in oxides containing multiple magnetic sublattices? Ce:YIG	JULIAN GESHEV
20:00 – 22:30	DINNER	



9th JUNE

Time	Title	Speaker
Breakfast (buffet)		
Chair: Prof. Enric CANADELL		
09:00 – 09:45	Thermal transport in 2D materials: the paradigmatic case of monolayer graphene	LUCIANO COLOMBO
09:45 – 10:05	Computing magnetic skyrmions in thin film samples: creation and guiding	CARLES NAVAU
10:05 – 10:25	Atomistic modeling of phonon transport through ferroelectric domain walls	MIQUEL ROYO
10:25 – 10:45	Flexovoltaics by design	ANDREA SCHIAFFINO
10:45 – 11:15	Coffee-Break	
Chair: Dr. M. Rosa PALACÍN		
11:15 – 12:00	X-ray diffraction fast data acquisition approaches using Flyscan platform (at Synchrotron SOLEIL)	CRISTIAN MOCUTA
12:00 – 12:20	Towards growth of nanocomposite YBCO films by CSD-Transient Liquid Assisted Growth	JULIA JAREÑO
12:20 – 12:40	Structure solution by δ -recycling from synchrotron multidomain tts-microdiffraction data	JORDI RIUS
12:40 – 13:00	Ferroelectric domains and polarization switching in epsilon-Fe ₂ O ₃	MARTÍ GICH
13:00 – 13:20	Stepped surface catalysts and surface dependence with catalytic activity	XAVIER TORRELLES
13:20 – 15:30	LUNCH TIME	
Chair: Dr. Gervasi HERRANZ		
15:30 – 16:15	Abrupt, non-volatile metal-insulator transition in oxide interfaces controlled by gate voltage and light	FABIO MILETTO
16:15 – 16:35	Temperature dependence of electroresistance in ferroelectric tunnel junctions	MENGDI QIAN
16:35 – 16:55	Spin currents diffusion across hybrid Pt/paramagnetic interfaces	ANTONIO HELGUERA
16:55 – 17:15	Unravelling hidden imprint fields in ferroelectric capacitors by light	FANMAO LIU
17:15 – 19:00	Coffee-Break and POSTER SESSION	
20:00 – 22:30	DINNER	



10th JUNE

Time	Title	Speaker
Breakfast (buffet)		
Chair: Prof. Amparo FUERTES		
09:00 – 09:50	Mixed-anion semiconductors for visible light induced water splitting	RYU ABE
09:50 – 10:10	Z-scheme Water Splitting into H ₂ and O ₂ Using Tungsten Acid as an Oxygen-evolving Photocatalyst under Visible Light Irradiation	HAJIME SUZUKI
10:10 – 10:30	Discharge products of metal/O ₂ batteries observed with nm resolution by energy-dependent x-ray transmission microscopy at the O-K edge	DINTO TONTI
	On-surface bottom-up synthesis of atomically precised nanostructures	CARLOS SÁNCHEZ
10:50 – 11:20	Coffee-Break	
Chair: Prof. Joan BAUSELLS		
11:20 – 11:40	Use of atomic layer deposition for improving pattern transfer in directed self-assembly of PS-b-PMMA	LAURA EVANGELIO
11:40 – 12:00	Strain effects on LCMO thin films: tuning magnetic anisotropy and transport properties	LAURA LÓPEZ-MIR
12:00 – 12:20	Chemical and structural characterization of misfit dislocation cores in ultrathin La _{0.7} Sr _{0.3} MnO ₃ epitaxial films on LaAlO ₃	NÚRIA BAGUÉS
12:20 – 12:40	Manipulating magnetic states in nanostructures with strain waves	FERRAN MACIÀ
12:40 – 13:00	Pyrolysis study of thick deposited YBCO precursor layers by ink jet printing. What have we learned?	BOHORES VILLAREJO
13:00 – 15:30	LUNCH TIME	
Chair: Prof. Benjamín MARTÍNEZ		
15:30 – 16:15	Ferroelectricity from spiral magnetic order close to RT in layered perovskites	MARISA MEDARDE
16:15 – 16:35	Some uncommon phenomena in cobalt oxides	JOSE LUIS GARCIA
16:35 – 16:55	Leakage Radiation Microscopy: A New Tool for Plasmon Imaging	RAFAEL CICHELERO
16:55 – 17:15	Batteries beyond Li-ion: viability of alternative chemistries	M. ROSA PALACÍN
15:15 – 17:35	Orange-red luminescence in rare earth activated oxynitridosilicates: LnM ₂ SiO ₃ N: Eu or Ce (Ln= La; M= Sr, Ba, Eu)	ASHLEY P. BLACK
17:35 – 18:00	Coffee-Break	
18:00 – 18:30	Summary and conclusions	Xavier Obradors
18:30	END OF SESSION	



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POSTER SESSION



- 1.- *On surface chemistry towards formation of azo-compounds on metals*
N. Ruiz del Arbol
- 2.- *Graphene growth from a MBE carbon source*
J. Mendez
- 3.- *Comparative study of the field-induced and spontaneous AF2' multiferroic phases in $MnWO_4$ and $Mn_{0.90}Co_{0.10}WO_4$ within the magnetic-symmetry framework*
I. Urcelay-Olabarria, J. L. García-Muñoz, E. Ressouche, A. A. Mukhin and V. Skumryev
- 4.- *Large magneto-dielectric effect and magnetic properties under field in Yb_2CoMnO_6*
J. Blasco, J. L. García-Muñoz, J. García, J. Stankiewicz, G. Subías, C. Ritter and J. A. Rodríguez-Velamazán
- 5.- *Magnetic ordering and spin reorientation across the magnetocrystalline transition in metallic $Pr_{0.50}Sr_{0.50}CoO_3$, investigated by neutron diffraction and x-ray techniques*
J.L. García-Muñoz, J. Padilla-Pantoja, J. Herrero-Martín, X. Torrelles, J. Blasco, E. Pellegrin, F. Fauth, B. Bozzo and J.A. Rodríguez-Velamazán
- 6.- *Origin of the multiferroic-like properties of Er_2CoMnO_6*
Javier Blasco, Gloria Subías, Joaquín García, Jolanta Stankiewicz, José Alberto Rodríguez-Velamazán, Clemens Ritter and José Luis Garcia-Muñoz
- 7.- *Magnetic properties above room temperature in magnetoelectric ϵ - Fe_2O_3*
M. Gich, J. Padilla, J. Nogués, J. Kreisel, A. Roig and J. L. Garcia-Muñoz
- 8.- *Synthesis of magnetic nanomaterials and their application in catalysis and bioimaging*
Changyong Lu, Susagna Ricart, Ramon Yáñez, Gerard Tobias and Josep Ros
- 9.- *Nanoengineered ferroelectric materials for next generation photovoltaics*
Pamela Machado, Mariona Coll, Mariano Campoy-Quiles, Xavier Obradors and Teresa Puig
- 10.- *Study of oxide nanoparticle evolution in ex-situ YBCO nanocomposites*
Ziliang Li, Mariona Coll, Natalia Chamorro, Bernat Mundet, Jaume Gazquez, Ferran Vallés, Anna Palau, Josep Ros, Susagna Ricart, Xavier Obradors and Teresa Puig
- 11.- *Oxygenation process of YBCO thin films studied from insitu electric resistivity measurements*
Alexander Stangl, Pablo Cayado, Cesar Sánchez, Anna Palau, Xavier Obradors and Teresa Puig
- 12.- *Synthesis of ABO₃ perovskite type nanoparticles by polyol methodology*
Natalia Chamorro, Susagna Ricart, Ramón Yáñez and Josep Ros
- 13.- *The role of citrate as self-assembler molecule in LnF₃ nanoparticles synthesis*
Jordi Martínez-Esaín, Jordi Faraudo, Susagna Ricart, Ramón Yáñez and Josep Ros
- 14.- *Deep investigation of antiphase-boundaries defects in rare-earth nickelates*
Bernat Mundet Bolós



- 15.- *Thermal conductivity of ferroelectric oxides through non-equilibrium molecular Dynamics*
Juan Antonio Seijas
- 16.- *First-principles calculations of the thermal conductivity of SiO₂ next to a phase transition*
Hugo Aramberri
- 17.- *Semiconductor oxides for Perovskite solar cells*
A Mingorance, J. Zhang, M. Campoy, G. Boschloo and M. Lira-Cantu
- 18.- *1000h Outdoor stability for Organic-Inorganic Halide Perovskite based Solar Cells (PSCs): Lifetime study and the effect of light intensity*
Y. Reyna, M. Salado, S. Kazim, A. Pérez-Tomas, S. Ahmad and M. Lira-Cantu
- 19.- *Photocatalytic hybrid nanocomposites of bacterial cellulose and Au/TiO₂ nanoparticles for hydrogen production*
Anna May-Masnou
- 20.- *Tuning the structure and the mechanical properties of epoxy-silica sol-gel hybrid materials*
Berta Domènech, Ignasi Mata, Mònica Benito and Elies Molins
- 21.- *Prominent local transport in silicon carbide composites containing in-situ synthesized three-dimensional graphene networks*
Pilar Miranzo, Laura López-Mir, Benito Román-Mansoa, Ana Pérez, Manuel Belmonte, M. Isabel Osendi and Carmen Ocal
- 22.- *Hard Carbon (HC) as Electrode Material for Sodium Ion Batteries*
E. Irisarri, A. Ponrouch and M.R. Palacin
- 23.- *How graphene improves the electrochemistry of iridium oxide: The new nanostructured hybrid as neural bioelectrodes*
E. Pérez, M. Lichtenstein, L. Ballesteros, C. Suñol and N. Casañ-Pastor
- 24.- *Optical Microscopy of Ferroic Domains*
Chen Yu
- 25.- *Influence of growth conditions and buffer layers on lattice strain and ferroelectricity of epitaxial BaTiO₃ films on silicon*
J. Lyu, M. Scigaj, I. Fina, G. Herranz and F. Sánchez
- 26.- *Growth and characterization of Y₃Fe₅O₁₂ ferrimagnetic thin films*
D. Bugallo, R. Cichelero, B. Casals, G. Herranz, V. Skumryev and F. Sánchez
- 27.- *Development of transparent conductors based on 3d transition-metal oxides*
Mathieu Mirjolet
- 28.- *Electron and phonon transport in twisted graphene nanoribbons: perspective for thermoelectricity*
A. Antidormi



- 29.- *Structural characterization of Gd₂Mo₃O₁₂ thin films grown onto YSZ(001) and YSZ buffered Si(001) substrate*
Graczyk P, Ferrater C, Bernal M, Coy L.E, Polo M.C, Bassas J.M and Varela M.
- 30.- *General Methodology for the construction of effective model potentials for lattice-dynamics simulation*
C. Escorihuela-Sayalero, Jacek C. Wojdel and Jorge Íñiguez
- 31.- *Magnetic properties of Ag₂Cu₃Cr₂O₈(OH)₄, a new mixed oxide with bidimensional Cu-O layers*
Alberto García, Nieves Casañ-Pastor, David Muñoz-Rojas, Jordi Rius, Oriol Vallcorba, Inma Peral, Judith Oró-Solé, Daniel S. Cook and Richard I. Walton
- 32.- *Homogeneous layer of core shell Fe/Fe₃O₄ Nano-cubes produced by Cluster Aggregation Source for Arsenic Removal*
Aanchal Alagh, Judith Oró, Laura López, Narcís Mestres, Carlos Frontera, Benjamín Martínez and Lluís Balcells
- 33.- *Exotic Magnetic order in Mn_{0.85}Co_{0.15}WO₄ multiferroic disclosed by RMXS*
Javier Herrero