

## DR. MARTÍ GICH

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Group of Nanoparticles & Nanocomposites  
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### PERSONAL DETAILS:

PLACE AND DATE OF BIRTH: SABADELL, SPAIN 20/01/1975  
NATIONALITY: SPANISH

### PROFESSIONAL APPOINTMENTS:

TENURED SCIENTIST (ICMAB-CSIC)	2014-PRESENT
RAMÓN Y CAJAL FELLOW (ICMAB-CSIC)	2010-2014
RESEARCH ENGINEER, SAINT-GOBAIN, AUBERVILLIERS, FRANCE	2006-2010
PH.D. STUDENT (ICMAB-CSIC)	2002-2006
PHYSICS LECTURER, ESCOLA UNIVERSITÀRIA DEL MEDI AMBIENT, BARCELONA	1998-2005

### EDUCATION:

Ph.D. in Materials Science, Universitat Autònoma de Barcelona, Spain	2006
M.Sc. in Materials Science, Universitat Autònoma de Barcelona, Spain	2002
B.Sc. in Physics, Universitat Autònoma de Barcelona, Spain	1998

### LINGUISTIC SKILLS:

Catalan, Spanish	native languages
English, French, Italian	good
Polish, Portuguese, Romanian	average
German	basic

**Dr. Martí Gich** is lecturer of the Master in Advanced Nanoscience and Nanotechnology of Universitat Autònoma de Barcelona and currently holds a permanent position of researcher at the Materials Science Institute of Barcelona ([www.icmab.es](http://www.icmab.es)), which belongs to the Spanish research council ([www.csic.es](http://www.csic.es)) and recognized as one of the top institutes in Spain by the “Severo Ochoa Centers of Excellence” label. He is a member of the Group of Nanoparticle and Nanocomposites (<http://departments.icmab.es/nn/>). His work focuses primarily on the understanding the structure-properties relationships in functional oxides and the preparation of nanoparticles in porous matrices and thin films. He has successfully supervised the PhD Thesis of the former CSC fellow Dr. Pengfei Niu (2012-2015) and is currently supervisor of the CSC fellow Zhang Qianzhe (PhD defense in September 2019) and Zheng Ma (PhD defense in September 2020).

### CURRENT RESEARCH INTERESTS:

I define myself as a materials scientist interested in the synthesis and understanding of functional materials through the study of structure-properties relationships. Specifically, my current research is focused into two main topics:

- I- **Preparation of functional oxides for applications.** The goal is to achieve significant advances in the preparation of oxides on supports compatible with its integration into devices. A first research line deals with the sol-gel synthesis of functional oxides on Si. A second line in this topic is the preparation of metal oxides based in  $\epsilon$ -Fe<sub>2</sub>O<sub>3</sub> in form of thin films for magneto-optical, magnetic and magnetoelectric applications.
- II- **Technological applications of porous nanocomposite materials.** This research topic aims at exploiting my expertise in this type of systems in a context of highly applied research in close collaboration with industry. Specific examples are i) the development of porous carbon/nanoparticle composites as electrodes in electrochemical sensors for the semi-continuous monitoring of water contaminants and ii) the development of mesoporous silica/metal oxide nanocomposites for drug delivery and medical imaging applications.

**FORMER RESEARCH INTERESTS:** Metallic glasses, nanocrystalline alloys and glass-ceramics.

—PUBLISHED PAPERS —

**(h-index=21; 984 citations in ISI Web of Knowledge with: Author=(gich m), May 2018)**

1. "Unveiling a new high-temperature ordered magnetic phase in  $\epsilon$ -Fe<sub>2</sub>O<sub>3</sub>" J.L. Garcia-Muñoz, A. Romaguera, F. Fauth, J. Nogués, M. Gich, *Chemistry of Materials* **29** (2017) 9705-9713.
2. "Piezo-generated charge mapping revealed through direct piezoelectric force microscopy", A. Gómez, M. Gich, A. Carretero-Genevriér, T. Puig, X. Obradors, *Nature Communications* **8** (2017) 1113.
3. "Electrical and mechanical switching of resistive states in semiconducting BaTiO<sub>3.6</sub> films on Si", A. Gómez, J. M. Vila-Fungairiño, R. Moalla, G. Saint-Girons, J. Gàzquez, M. Varela, R. Bachelet, M. Gich, F. Rivadulla, A. Carretero-Genevriér, *Small* **13** (2017)170164.
4. "Carbon-silica composites to produce highly robust thin-film electrochemical microdevices", P. Niu, L. Asturias-Arribas, X. Jordà, A. R. Goñi, A. Roig, M. Gich, C. Fernández-Sánchez, *Advanced Materials Technologies* **2** (2017) 1700163.
5. "Screen-printed electrodes made of a bismuth nanoparticle porous carbon nanocomposite applied to the determination of heavy metal ions", P. Niu, C. Fernández-Sánchez, M. Gich, C. Navarro-Hernández, P. Fanjul-Bolado, and A. Roig, *Microchimica Acta* **183** (2016) 617.
6. "Gold nanotriangles decorated with superparamagnetic iron oxide nanoparticles: a compositional and microstructural study" J.A. Hachtel, S. Yu , A.R. Lupini, S.T. Pantelidea, M. Gich, A. Laromaine, A. Roig, *Faraday Discussions*, **191** (2016) 215.
7. "Alignment under magnetic field of mixed Fe<sub>2</sub>O<sub>3</sub>/SiO<sub>2</sub> colloidal mesoporous particles induced by shape anisotropy", J.G. Li, G. Fornasieri, A. Bleuzen, M. Gich, A. Gloter, F. Bouquet, M. Impéror-Clerc, *Small* **12** (2016) 5981.
8. "Electrochemically Active Thin Carbon Films with Enhanced Adhesion to Silicon Substrates", P. Niu, L. Asturias-Arribas, M. Gich, C. Fernández-Sánchez, A. Roig, *ACS Applied Materials & Interfaces* **8** (2016) 31092.
9. "Preparation of macroporous quartz films in silicon by chemical solution deposition" A. Carretero-Genevriér, M. Gich, *Journal of Visualized Experiments* (2015) e53543.
10. "Screen-printed electrodes made of a bismuth nanoparticle porous carbon nanocomposite applied to the determination of heavy metal ion" P. Niu, C. Fernandez Sanchez, M. Gich, C. Navarro-Hernandez, P. Fanjul, A. Roig, *Microchimica Acta* **183** (2015) 617-623.
11. "Integration of functional complex oxide nanomaterials on silicon" J. M. Vila-Fungairiño, R. Bachelet, G. Saint-Girons, M. Gendry, M. Gich, J. Gàzquez, E. Ferain, F. Rivadulla, J. Rodríguez-Carvajal, N. Mestres, A. Carretero-Genevriér, *Frontiers in Physics* **3** (2015) 38.

12. "Electroanalytical Assessment of heavy Metals in Waters with Bismuth Nanoparticle-Porous Carbon Paste Electrodes", P. Niu, C. Fernández-Sánchez, M. Gich, C. Ayora, A. Roig, *Electrochimica Acta* **165** (2015) 155-161.
13. "Crystallization of hollow mesoporous silica nanoparticles" G. L. Drisko, A. Carretero-Genevri, A. Perrot, Alexandre, M. Gich, J. Gàzquez, J. Rodríguez-Carvajal, L. Favre, D. Grosso, C. Boissière, C. Sanchez, *Chemical Communications* **51** (2015) 164-167.
14. "Chiral Habit selection on nanostructured epitaxial quartz films" A. Carretero-Genevri, M. Gich, L. Picas, C. Sanchez, J. Rodríguez-Carvajal, *Faraday Discussions* **179** (2015) 227-233.
15. Crystallization of hollow mesoporous silica nanoparticles. G. L. Drisko, A. Carretero-Genevri, A. Perrot, Alexandre, M. Gich, J. Gàzquez, J. Rodríguez-Carvajal L. Favre, D. Grosso, C. Boissière, C. Sanchez, *Chemical Communications* **51** (2015) 164-167.
16. "Zero-field quantum tunneling relaxation of the molecular spin in Fe-8 observed by Fe-57 Mössbauer spectrometry" E. Molins, M. Gich, J. Tejada, J. M. Grenèche, F. Macià, *Europhysics Letters* **108** (2014) 47004.
17. "Water-Induced Phase Separation Forming Macrostructured Epitaxial Quartz Films on Silicon" G. L. Drisko, A. Carretero-Genevri, M. Gich, J. Gàzquez, D. Ferrah, D. Grosso, C. Boissière, J. Rodríguez-Carvajal, C. Sanchez, *Advanced Functional Materials* **24** (2014) 5494-5502.
18. "Multiferroic Iron Oxide Thin Films at Room Temperature", M. Gich\*, I. Fina, A. Morelli, F. Sánchez, M. Alexe, J. Gàzquez, J. Fontcuberta, A. Roig, *Advanced Materials* **26** (2014) 4645-4652.
19. "Electronic and Magnetic Structure of LaSr-2 x 4 Manganese Oxide Molecular Sieve Nanowires" J. Gàzquez, A. Carretero-Genevri, M. Gich, N. Mestres, , M. Varela, *Microscopy and Microanalysis* **20** (2014) 760-766.
20. "Electromagnon in ferrimagnetic  $\epsilon$ -Fe<sub>2</sub>O<sub>3</sub> nanograin ceramics" Ch. Kadlec, V. Goian, F. Kadlec, M. Gich, M. Kempa, S. Rols, M. Savinov, J. Prokleska, M. Orlita, S. Kamba *Physical Review B* **88** (2013) 104301.
21. "Facile Synthesis of Porous Bismuth-Carbon Nanocomposites for the Sensitive Detection of Heavy Metals" M. Gich\*, C. Fernández-Sánchez, C. Cotet, P. Niu, A. Roig *Journal of Materials Chemistry A* **1** (2013) 11410-11418.
22. "Soft Chemistry Based Routes to Epitaxial  $\alpha$ -Quartz Thin Films with Tunable Textures" A. Carretero-Genevri, M. Gich, L. Picas, J. Gàzquez, G. L. Drisko, J. Rodríguez-Carvajal, C. Boissière, D. Grosso, C. Sanchez *Science* **340** (2013) 827-831.
23. "Surface reactivity of ferrite nanoparticles by microwave synthesis; comparison with thermal decomposition route" O. Pascu, E. Carezza, M. Gich, S. Estradé, Francesca Peiró, G. Herranz, A. Roig *The Journal of Physical Chemistry C* **116** (2012) 15108-15116.
24. "2D magnetic frames obtained by Microwave assisted synthesis" O. Pascu, M. Gich, G. Herranz, A. Roig, *European Journal of Inorganic Chemistry* (2012) 2656-2660.
25. "Charge transport and Electrochemical Properties of Colloidal Greigite" (Fe<sub>3</sub>S<sub>4</sub>), A. Paoella, Ch. George, M. Povia, Y. Zhang, R. Krahne, M. Gich, A. Genovese, A. Falqui, M. Logobardi, P. Guardia, T. Pellegrino, L. Manna, *Chemistry of Materials* **23** (2011) 3762-3768.
26. Epitaxial stabilization of  $\epsilon$ -Fe<sub>2</sub>O<sub>3</sub> (001) thin films on SrTiO<sub>3</sub> (111)", M. Gich\*, J. Gàzquez, A. Roig, A. Crespi, J. Fontcuberta, J.C. Idrobo, S.J. Pennycook, M. Varela, V. Skumryev, M. Varela, *Applied Physics Letters* **96** (2010) 112508.
27. "Nanospheres of Silica with an  $\epsilon$ -Fe<sub>2</sub>O<sub>3</sub> Single Crystal Nucleus", E. Taboada, A. Roig, M. Gich *ACS Nano* **3** (2009) 3377-3382.
28. "Nonzero orbital moment in high coercivity  $\epsilon$ -Fe<sub>2</sub>O<sub>3</sub> and low-temperature collapse of the magneto-crystalline anisotropy", Y.-Ch. Tseng, N. M. Souza-Neto, D. Haskel, M. Gich\*, C. Frontera, Anna Roig, Michel van Veenendaal, and Josep Nogués, *Physical Review B* **79** (2009) 094404.

29. "Magnetic behaviour of Fe-Cr nanoparticles system" K. Racks, A. Slawska-Waniewska, A. Kryzewski, M. Gich, A. Roig, E.A. Shafranovsky and Yu. I. Petrov, *Journal of Magnetism and Magnetic Materials* **320** (2008) e683–e687.
30. "Stabilization of metastable phases in spatially restricted fields: the case of the Fe<sub>2</sub>O<sub>3</sub> polymorphs", M. Gich, A. Roig, E. Taboada, E. Molins, C. Bonafos, E. Snoeck, *Faraday Discussions* **136** (2007) 345-354.
31. "The Villabeto de la Peña meteorite fall: III. Bulk Chemistry, mineralogy, magnetic properties 57Fe Mössbauer spectroscopy and Raman spectroscopy", J. Llorca, M. Gich, E. Molins, *Meteoritics and Planetary Science* **42** (2007) A117-A182 suppl. S.
32. "Versatility in the mode of coordination {(N), (N, O), (C, N), (C, N, O)<sup>2-</sup>} of [(η<sup>5</sup>-C<sub>5</sub>H<sub>5</sub>)Fe{(η<sup>5</sup>-C<sub>5</sub>H<sub>4</sub>)-CH=N-C<sub>6</sub>H<sub>4</sub>-2OH)] to palladium (II)", S. Perez, C. López, A. Caubet, X. Solans, M. Font-Bardía, M. Gich, E. Molins, *Journal of Organometallic Chemistry* **692** (2007) 2402-2414.
33. "High and low-temperature crystal and magnetic structures of ε-Fe<sub>2</sub>O<sub>3</sub> and their correlations to its magnetic properties", M. Gich\*, C. Frontera, A. Roig, E. Taboada, E. Molins, H. R. Rechenberg, J. D. Adrison, W. A. A. Macedo, C. Ritter, V. Hardy, J. Sort, V. Skumryev, J. Nogués, *Chemistry of Materials* **18** (2006) 3889-3897.
34. "Spin transition in a triazine-based Fe(II) complex: variable-temperature structural, thermal, magnetic and spectroscopic studies", M. Quesada, M. Monrabal, G. Aromí, V. A. De la Peña-O'Shea, M. Gich, E. Molins, O. Roubeau, S. J. Teat, E. McLean, P. Gamez, J. Reedijk, *Journal of Materials Chemistry* **16** (2006) 2669-2676.
35. "Structural and magnetic properties of bulk alloys and aerosol nanoparticles in the Fe<sub>100-x</sub>Cr<sub>x</sub> system", E.A. Shafranovsky, Yu.I. Petrov, M. Gich, K. Racka, A. Slawska -Waniewska, A. Roig, E. Molins, *Journal of Alloys and Compounds* **416** (2006) 51–57.
36. "Synthesis and Structural Characteristics of Carbon Aerogels with a High Content of Fe, Co, Ni, Cu, and Pd", L.C. Cotet, M. Gich, A. Roig, I.C. Popescu, V. Cosoveanu, E. Molins, V. Danciu *Journal Non-Crystalline Solids* **352** (2006) 2772–2777.
37. "Magnetoelectric coupling in ε-Fe<sub>2</sub>O<sub>3</sub> nanoparticles" M. Gich\*, N. Bellido, C. Frontera, A. Roig, E. Molins, J. Fontcuberta, Ch. Simon, C. Fleta, *Nanotechnology* **17** (2006) 687-691.
38. "Faraday rotation measurements in maghemite-silica aerogels", E. Taboada, R. P. del Real, M. Gich, A. Roig, E. Molins, *Journal of Magnetism and Magnetic Materials* **301** (2006) 175-180.
39. "Structural and magnetic properties of bulk alloys and aerosol nanoparticles in the Fe<sub>100-x</sub>Cr<sub>x</sub> system" E. A. Shafranowsky, Y. I. Petrov, M. Gich, K. Racka, A. Slawska-Waniewska, A. Roig, E. Molins, *Journal of Alloys & Compounds* **416** (2006) 51-57.
40. "Investigations of the stability of {[t(acn)<sub>6</sub>Fe<sub>8</sub>(μ<sub>3</sub>-O)<sub>2</sub>(μ<sub>2</sub>-OH)<sub>12</sub>]Br<sub>7</sub>(H<sub>2</sub>O)}Br·8H<sub>2</sub>O, (Fe<sub>8</sub>) cluster in aqueous solution by spectroscopic and magnetic methods" E. Rodriguez, M. Gich, A. Roig, E. Molins, N. Nedelko, A. Slawska-Waniewska, A. Szewczyk,, *Polyhedron* **25** (2005) 113-118.
41. "Large coercivity and low-temperature magnetic reorientation in ε-Fe<sub>2</sub>O<sub>3</sub> nanoparticles", M. Gich, A. Roig, C. Frontera, E. Molins, J. Sort, M. Popovici, G. Chouteau, D. Martín y Marero, J. Nogués, *Journal of Applied Physics* **98** (2005) 044907.
42. "High-quality microwave archeointensity determinations from an early 18<sup>th</sup> century AD English brick klin", Ll. Casas, J. Shaw, M. Gich, J. A. Share, *Geophysical Journal International* **161** (2005) 653-661.
43. "Aerosol nanoparticles in the Fe<sub>1-x</sub>Cr<sub>x</sub> system –room temperature stabilization of the σ-phase and σ → α phase transition", M. Gich, E. A. Shafranovsky, A. Roig, A. Ślawska-Waniewska, K. Racka, Ll. Casas, Yu. I. Petrov, E. Molins, M. F. Thomas, *Journal of Applied Physics* **98** (2005) 024303. Also selected for online publication in the *Virtual Journal of Nanoscale Science and Technology* **12** (2005).

44. "Magnetic properties of Fe nanoparticle systems", K. Racka, M. Gich, A. Ślowska-Waniewska, A. Roig, E. Molins, *Journal of Magnetism and Magnetic Materials* **290-291** (2005) 127-130.
45. "Optimized synthesis of the elusive  $\epsilon$ -Fe<sub>2</sub>O<sub>3</sub> phase by sol-gel chemistry" M. Popovici, M. Gich, D. Nižňanský, A. Roig, C. Savii, Ll. Casas, E. Molins, K. Zaveta, C. Enache, J. Sort, S. de Brion, G. Chouteau, J. Nogués, *Chemistry of Materials* **16** (2004) 5542-5548.
46. "Effect of surface modifications on magnetic coupling in Fe nanoparticle systems", A. Ślowska-Waniewska, A. Roig, M. Gich, Ll. Casas, K. Racka, N. Nedelko and E. Molins, *Physical Review B* **70** (2004) 054412.
47. "Ultra-porous single phase oxide-silica nanostructured aerogels from ferrous precursors", M. Popovici, M. Gich, A. Roig, Ll. Casas, E. Molins, C. Savii, D. Becherescu, J. Sort, S. Suriñach, J. S. Muñoz, M. D. Baró, J. Nogués, *Langmuir* **20** (2004) 1425-1429.
48. "High-coercivity ultralight transparent magnets", M. Gich, Ll. Casas, A. Roig and E. Molins, J. Sort, S. Suriñach, M.D. Baró, J.S. Muñoz, L. Morellon, M.R. Ibarra, J. Nogués, *Applied Physics Letters* **82** (2003) 4307-4309.
49. "Crystallization of Al<sub>4</sub>Ni<sub>6</sub>Ce glass and its influence on mechanical properties", M. A. Muñoz-Morris, S. Suriñach, M. Gich, M. D. Baró and D. G. Morris, *Acta Materialia* **51** (2003) 1067-1077.
50. "Glass forming ability and crystallization processes in the Al-Ni-Sm system", M. Gich, T. Gloriant, S. Suriñach, A. L. Greer, M. D. Baró, *Journal of Non-Crystalline Solids* **289** (2001) 214-220.
51. "Evaluation of the volume fraction during devitrification of Al-based amorphous alloys. T. Gloriant, M. Gich, S. Suriñach, A. L. Greer, M. D. Baró, *Materials Science Forum* **343-346** (2000) 365-368.

— PATENTS —

1. Title: Device and Method for mapping Ferroelectric and/or Piezoelectric Samples  
Inventors: A. Gómez, M. Gich, A. Carretero-Genevri, T. Puig, X. Obrador  
Application number: EP 16382398  
Priority date: 18/08/2016
2. "Material Compuesto que comprende una matriz porosa de carbón amorfo y nanopartículas de Bi obtenible mediante un procedimiento sol-gel, procedimiento de obtención y uso"  
Application Number : P201231869  
Date of application: 30/11/2012. Applicant: CSIC  
Inventors: César Fernandez-Sanchez, Martí Gich, Anna Roig, Liviu Cosmin Cotet
3. "Procédé de préparation d'une couche de quartz-alpha épitaxiée sur support solide, matériau obtenu et applications"  
Application Number : FR1257101  
Date of application: 23/07/2012. Applicants: UPMC, CNRS, CSIC.  
Inventors: C. Boissière, D. Grosso, A. Carretero, C. Sanchez, M. Gich,
4. "Guide Optique par laser dans vitroceramique"  
Priority Number: FR2010002789 2000701  
Date of application: 01/07/2010. Applicant: Eurokera SNC.  
Inventors: G. Counil, L. Canova, M. Gich, S. Pelletier, J. Sellier, A. Huignard
5. "Thin fine grained fully dense glass-ceramic seals for SOFC stack" US patent application number 12/947.407. Filing date: 16/11/2010. Applicant: Saint-Gobain Ceramics & Plastics, Inc.  
Inventors: S. S. Parihar, G. Querel and M. Gich.

6. "Glass-ceramic materials and methods of forming". US patent provisional application number US\_61-250437. Date of application 09.10.2009 Applicant: Saint-Gobain; Inventors: F. Lienhart, G. Querel and M. Gich.

—BOOK CHAPTERS—

1. "Multiferroic Oxide Thin Films", M. Gich and Zheng Ma, in *Encyclopedia of Interfacial Chemistry: Surface Science and Electrochemistry*, included in the Elsevier's Reference Module in Chemistry, Molecular Sciences and Chemical Engineering (<https://doi.org/10.1016/B978-0-12-409547-2.12879-3>), Elsevier, 2017
2. "Nanocomposites for Electrochemical Sensor Applications", Niu, P.; Gich, M.; Fernández-Sánchez, C.; Roig, A. Sol-Gel. In *The Sol-Gel Handbook*; Levy, D., Zayat, R., Eds.; Wiley-VCH Verlag GmbH & Co. KgaA: Weinheim, Germany, 2015; pp. 1413–1434. ISBN 978-3-527-67081-9
3. "Catalytic wet peroxide oxidation of reactive azo dyes over iron-containing pillared catalyst" in *Materiales Arcillosos: de la geología a las nuevas aplicaciones*. Pp. 87-98 C. Catrinescu, M. Neamtu, J. Míche-Brendlé, M. Gich and A. Kettrup Edited in 2006 by the Sociedad Española de Arcillas, M. Suárez, M. A. Vicente, V. Rives and M. J. Sánchez Editors. ISBN: 84-689-6471-9

— PROCEEDINGS —

1. "Mössbauer studies on Ultraporous Fe-oxide/SiO<sub>2</sub> Aerogels" A. Lančok, K. Zavěta, M. Popovici, C. Savii, M. Gich, A. Roig, E. Molins, J. Nogues, K. Bračová, *Hyperfine interactions* **165** (2003) 203-208.
2. "Large Room Temperature Coercivity in  $\epsilon$ -Fe<sub>2</sub>O<sub>3</sub> nanoparticles" (extended abstract) J. Nogués, M. Gich, A. Roig, J. Sort, C. Frontera, M. Popovici, V. Skumryev, W. A. A. Macedo, H. R. Rechenberg, E. Molins, Proceedings of the international conference on Composites/nanoengineering, David Hui Editor.
3. "Magnetic properties of Fe-Fe oxide particle systems", K. Racka, M. Gich, A. Roig, A. Krzyzewski, A. Slawska-Waniewska, *Archives of Materials Science* 25, 4 (2004) pp. 469.
4. "Synthesis and Characterization of Magnetic Aerogels Prepared from Iron and Nickel Precursors", M. Popovicia, A. Roig, C. Savii, M. Gich, M. Benito, E. Molins, D. Becherescu, J. Nogués, *Annals of the West University of Timmisoara, Series Chemistry* 12, 3 (2003) 1023-1028.
5. "Cavitation. A miscellaneous topic for the introductory physics course" M. Gich and D. Couso in *International Conference Physics Teacher Education Beyond 2000. Selected Contributions*, R. Pintó and S. Suriñach editors. Elsevier Editions ISBN 2-84299-312-8 Paris 2001.

—COMPETITIVE RESEARCH PROJECTS AS PRINCIPAL INVESTIGATOR—

1.

Funding Agency:	Spanish Government (MINECO)
Contract:	MAT2014-61835-EXP
Start date:	September 1st 2015
End date:	August 31st 2016
Project title:	Discovery of new low density materials under negative pressures
Funds:	54.450 €

2.  
Funding Agency: European Union, Marie Curie Actions  
Contract: PCIG09-GA-2011-294168  
Start date: September 1st 2011  
End date: March 1st 2015  
Project title: Confined synthesis of metastable complex oxides  
Funds: 87.500 €

3.  
Funding Agency: Spanish Government (MINECO)  
Research Institution: Institut de Ciència de Materials de Barcelona-CSIC  
Contract: RyC-2009-04335  
Start date: April 15th 2010  
End date: April 15th 2012  
Project title: Relationship between structure and functional properties in oxide nanoparticles and thin films  
Funds: 15.000 €

—COMPETITIVE RESEARCH PROJECTS AS PARTICIPANT—

1.  
Funding Agency: Spanish Government (MINECO)  
Contract: MAT2015-64442-R  
Start date: January 2015  
End date: December 2018  
Project title: *Desarrollo de Materiales Nanocompuestos de Celulosa Bacteriana*  
Funds: 217.800 €  
PI: Anna Roig

2.  
Funding Agency: Spanish Government (MINECO)  
Contract: MAT2012-35324  
Start date: January 2013  
End date: December 2015  
Project title: *Técnicas Avanzadas de Preparación de Nanopartículas y su Evaluación Biomédica y Bioambiental*  
Funds: 105.300 €  
PI: Anna Roig

3.  
Funding Agency: European Union, Marie Curie Actions  
Contract: FP7 OCEAN-2013- Reference 614155  
Start date: November 1st 2013  
End date: February 1st 2017  
Project title: *Cost-Effective Sensors, interoperable with international existing ocean observing systems, to meet EU policies requirements (COMMON SENSE)*  
Funds: 104.988 € (out of 4.664.072 €)  
PI: LEITAT

—INVITED TALKS AT MEETINGS AND SYMPOSIA—

1. *Discovering new low density polymorphs via negative pressure synthesis.* iPolymorphs workshop, June 2016, Donosti (Spain)
2. *Multiferroicity and magnetoelectric coupling in iron oxides.* Challenges in multiferroics workshop, October 2015, Jülich (Germany)

—ATTENDANCE TO MEETINGS AND SYMPOSIA—

3. Oral presentation: *Stabilisation of metastable multifunctional polymorphs.* Advanced Complex Inorganic Nanomaterials 2011, Namur (Belgium)
4. Oral presentation: *Enlarging the scope of magnetoelectric oxide materials: the case of  $\epsilon$ - $\text{Fe}_2\text{O}_3$ .* NANOSELECT Workshop 2010. Sant Feliu de Guíxols, Spain, July 2010.
5. Oral presentation: *Magnetic structure and magnetoelectric coupling in  $\epsilon$ - $\text{Fe}_2\text{O}_3$  Nanoparticles.* Polymorphs. 7<sup>th</sup> International Conference on Fine Particle Magnetism (ICFPM-2010), Uppsala, Sweden June 2010.
6. Oral presentation: *Stabilisation of metastable phases in spatially restricted fields: the case of  $\text{Fe}_2\text{O}_3$ .* Polymorphs. Faraday Discussions 136, London, April 2007.
7. Oral presentation: *Magnetoelectric coupling in  $\epsilon$ - $\text{Fe}_2\text{O}_3$  Nanoparticles.* Symposium U, 2005 MRS Fall Meeting, Boston, USA, November 2005.
8. Oral presentation: *Sol-gel Synthesis of  $\epsilon$ - $\text{Fe}_2\text{O}_3$  Nanoparticles and Tuning of the Material Magnetic Properties.* MC7: Functional Materials for the 21<sup>st</sup> Century, Edinburgh, United Kingdom, July 2005.
9. Poster: *Several synthetic routes to obtain ultra-light and/or transparent magnetic materials.* III Reunión Nacional de Física del Estado Sólido, San Sebastián, Spain, June 2004.
10. Poster: *Imanes transparentes ultraligeros.* Primera reunión de expertos en tecnologías de fluidos comprimidos, Madrid, Spain, November 2003.
11. Poster: *Ultralight transparent magnets.* International Conference on Magnetism, Rome, Italy, July 2003.
12. Poster: *Glass forming ability and crystallisation processes in the Al-Ni-Sm system.* International Workshop on Non-crystalline Materials, Bilbao, Spain, September 2000.
13. Oral presentation: *Cavitation. A miscellaneous topic for the introductory physics course.* Physics Teacher Education Beyond 2000, Barcelona, Spain, August 2000.

—STAYS IN RESEARCH CENTRES—

1. LMGP-CNRS, Grenoble Institute of Technology, MINATEC (collaboration with Jens Kreisel) Grenoble, France (one week September 2010): Temperature dependent Raman Spectroscopy.
2. Laboratoire CRISMAT/ENSI-Caen CNRS-UMR 6508 (under the supervision of Dr. Charles Simon) Caen, France (6 months, June-September 2006): Magnetoelectric properties of oxides.
3. CEMES-CNRS. (under the supervision of Dr. Caroline Bonafos) Toulouse, France (15 days, January-February 2005): HRTEM studies of magnetic nanoparticles
4. Laboratoire de Physique de l'État Condensé CNRS-UMR 6087. Université du Maine (under the supervision of Dr. Jean-Marc Grenèche) Le Mans, France (15 days, February 2004): Mössbauer spectroscopy under magnetic fields
5. Dipartimento di Chimica Inorganica e Metallurgica. Università degli Studi di Genova (under the supervision of prof. Riccardo Ferro) Genova, Italy (2 months, July-September 1999): Thermodynamics of Al-Ni-Sm alloys.



### —EXPERIMENTS IN LARGE FACILITIES AS MAIN PROPOSER—

1. Advanced Light Source, Berkeley, USA (August 2018)
2. European Magnetic Field Laboratory, Dresden (January 2018)
3. ALBA Cells Synchrotron, Cerdanyola, Spain. One experiment as main proposer (June 2012)
4. European Synchrotron Radiation Facility (ESRF), Grenoble, France. Two experiments as main proposer (February 2013, April 2005).
5. Institut Laue Langevin (ILL), Grenoble, France. Three experiments as main proposer (May 2012, September 2010, February 2005).

### —ATTENDANCE TO COURSES—

1. Management and Communication. Imparted by Mylam Conseil, Aubervilliers, France January 2008.
2. Patents and Intellectual Property, Imparted by the Saint-Gobain IP service, Aubervilliers, France March 2008.
3. Course on Innovation and Creativity Imparted by the Collège de Polytechnique Aubervilliers, France November 2007.
4. European School on Nanosciences and Nanotechnologies (ESSON-2006), Grenoble, France 27/08-15/09 2006.
5. Course on the determination of magnetic structures from neutron powder diffraction. Jaca, Spain September 2005
6. Course on Scanning Electron Microscopy imparted by FEI company. Barcelona, January 2004.
7. Course on manipulation and control of gases. Organized by CSIC. Barcelona, December 2003.
8. Course to become operator of radioactive installations. Spanish Nuclear Council Diploma. Barcelona, February 2002.
9. Barcelona 2001 Euro-Summer School. Electron Crystallography and Cryo-Electron Microscopy on inorganic and organic and biological molecules. Barcelona 23-27 July 2001.

### —TEACHING—

More than 1250 hours of teaching experience in the following university courses:

1. 2015 – present Associate Lecturer – *Nanoparticle applications*, Nanotechnology Master, Universitat Autònoma de Barcelona (UAB) (6h per annum)
2. Mathematical Methods and Data Processing, 2<sup>nd</sup> year of B.Sc. Geology studies, theoretical classes, UAB, Barcelona, Spain, 09/2004-09/2005.
3. Materials Science, 2<sup>nd</sup> course of B.Sc. Geology studies, theoretical classes, UAB, Barcelona, Spain, 09/2004-09/2005.
4. General Physics, 1<sup>st</sup> year Chemical Engineering students, theoretical classes, Escola Universitària del Medi Ambient, UAB, Barcelona, Spain, 09/98-09/2005.
5. General Physics, 1<sup>st</sup> year of B.Sc. Chemistry studies, practical classes (problems), UAB, Barcelona, Spain, 09/98-09/2001.  
Thermodynamics for 2<sup>nd</sup> course of B.Sc. Physics studies, practical classes (laboratory), UAB, Barcelona, Spain, 09/98-09/2001.

### —SUPERVISION OF PHD THESIS—

**Niu Pengfei** *Carbon Xerogel Nanocomposite Materials for Electrochemical Devices: Application to Heavy Metal Detection* (18/09/2015) Co-supervised with Dr. César Fernández-Sánchez. Now associate lecturer at Tianjin University (China)

**Qianzhe Zhang** *Epitaxial quartz films on Si: Microstructural control for sensing applications* (tentative defense September 2019) Co-supervised with Dr. Adrian Carretero-Genevri

**Zheng Ma** *Understanding the ferroelectricity and magnetoelectric coupling in  $\epsilon$ -Fe<sub>2</sub>O<sub>3</sub>* (tentative defense September 2020)

**Jan Grzelak** *Mesoporous magnetic nanorods for theranostics* (tentative defense October 2020) Co-supervised with Prof. A. Roig

#### —SUPERVISION OF POSTDOCTORAL FELLOWS—

**Woicich Saletra** *Stabilization of New Polymorphs* (October 2015-March 2015)

**Laura Asturias** *Electrochemical sensing of heavy metals in sea water* (January 2015-July 2016) appointed within the EU project COMMON –SENSE (

#### —STUDENT TUTORING—

1. **Anyi Jin** last year BSc student in Chemistry at UAB, Barcelona, “Synthesis and characterization of epitaxial SiO<sub>2</sub>-GeO<sub>2</sub> films on Si(100)” (October 2017-February 2018)
2. **Albert Serra** MSc student at Universitat Ramon Llull, Barcelona “Microfabrication of microelectrodes by combined chemical solution deposition and photolithography” (September 2017-February 2018)
3. **Mihaela Tomickova**, PhD student at Palacky University, Olomuc, Czech Republic “Synthesis of Sc-doped  $\epsilon$ -Fe<sub>2</sub>O<sub>3</sub>” (September-December 2017)
4. **Ander Arbide** last year BSc student in Nanoscience at UAB, Barcelona, “Microfabrication of microelectrodes by combined chemical solution deposition and photolithography” (January 2017-June 2017)
5. **Valentin Natarov**, PhD student at Minsk University, Belarus Synthesis of Mesoporous silica Nanorods with metal nanoparticles”
6. **Natalia Saez** MSc student of biomedical engineering at Universitat de Barcelona “Culturing Fibroblasts on piezoelectric quartz films on Si(100)” (September-December 2015)
7. **Jose Luis Ocaña**, “Synthesis of hard magnetic materials without rare earths” (January-June 2014)
8. **Daniel Beltran**, “Synthesis and characterization of epitaxial SiO<sub>2</sub>-GeO<sub>2</sub> films on Si(100)” (January-June 2014)
9. **Mathieu Cailhau** 2nd year MSc student at Chimie ParisTech “Synthesis of hard magnetic composites of Mn<sub>x</sub>Fe<sub>2-x</sub>O<sub>3</sub> and  $\epsilon$ -Fe<sub>2</sub>O<sub>3</sub> Microwave synthesis and Sol-Gel Chemistry” (March-August 2013)
10. **Eric Segura** last year MSc student in Physics at the UAB “Preparation of Al<sub>x</sub>Fe<sub>2-x</sub>O<sub>3</sub> by Atomic Layer Deposition” 6 month Internship (January-June 2012)
11. **Aqeel Aslam**, last year BSc student at the Faculty of Materials Sciences and Engineering GIK Institute, Topi Pakistan, 2 months (June-July 2010), “Magnetic core-shell nanoparticles”.
12. **Muhammad Hamza Ikram**, last year BSc student at the Faculty of Materials Sciences and Engineering GIK Institute, Topi Pakistan, 2 months (June-July 2010), “Nanostructured silica and carbon aerogels for electrochemical sensor devices”.
13. **Julien Lambert**, MSc student at University of Rennes, 6 month internship (March-August, 2009), “Development of a system for the measurement of the electrical conductivity of molten glass”.
14. **Rémi Olivon**, University of Rennes, 6 months (March-July, 2007) “Porous glass-ceramics”.

—AWARDS AND HONOURS—

1. Best PhD thesis award in Materials Science at Universitat Autònoma de Barcelona, 2006  
“Magnetic Nanoparticles confined in silica matrices

—COMMISSIONS OF TRUST—

**Reviewer for scientific journals:** Advanced Materials, Nature Communications, Chemistry of Materials, Advanced Functional Materials, Journal of Materials Chemistry, Crystal Engineering Communications, Journal of Physics: Condensed Matter, Journal of Physics D: Applied Physics, among others (see detailed activity at <https://publons.com/author/1292667/marti-gich#profile>)

**Chairman of the evaluation committee** for the competitive examinations to the Civil Service for Graduate Technicians for the Spanish Scientific Research Council-CSIC, January-December 2017

**Member of the evaluation committee** for the competitive examinations to the Civil Service for Tenured Scientists for the Spanish Scientific Research Council-CSIC, June 2017

**Reviewer for funding agencies:** FONYCT, Argentina (2016); National Science Centre, Poland (2015)

—MEMBERSHIPS—

1. Spanish Club of Magnetism.
2. Catalan Physics Society