Activity Report

2011/12

Institut de Nanociència i Nanotecnologia
de la Universitat de Barcelona

Graphic design and layout: Cristina Muñoz Idoate | **www.idoate.com**

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PRESENTATION AND OBJECTIVES

A thorough understanding of the behaviour of matter at both the atomic and the molecular scales is possible nowadays thanks to the wide background of theories and models existing to this end. This is also true of the behaviour of matter at microscopic level. There is, however, an entire field yet to be explored just in the middle, where systems present dimensions of about, or below, 100 nanometers. A large number of processes and phenomena, such as the ones which take place during catalysis, or the ones observable in immunology, electronics, magnetism, or optics, present similar lengths as well. A wide range of properties having their origins in the processes which take place in such scale lengths can be modified just by controlling the structure of systems at nanometric scale. The manufacturing and the study of nanosystems which may offer alternative functional properties are therefore the biggest challenges which nanoscience and nanotechnology set before us today, and we can face these challenges with the help of the wide knowledge we already have in these disciplines and of a large choice of methodologies.

The great expectations existing nowadays about the application of new technologies based on the development of nanostructured materials, as well as of new tools aimed at an accurate handling of the nanoscale, have pebbled the way for a research field which is now experiencing a decisive growth: nanotechnology. The various applications of nanotechnology can be seen and felt each day with higher intensity, and its impact on everyday life shall not definitely stop growing in the near future. Nanotechnology can in fact be applied to almost every field of research nowadays and, without doubt, it shall be at the basis of most technologies of the future.

The University of Barcelona created in 2006 the Institute of Nanoscience and Nanotechnology (IN^{2}UB), which has as an aim to coordinate multidisciplinary research activities carried out by several research groups of this institution. The IN^{2}UB wants to contribute to the progress of science and innovation while spurring, at the same time, industrial excellence. Researchers who are members of the IN^{2}UB come from different scientific disciplines, such as Physics, Chemistry, Pharmacy Science, Biochemistry and Medicine. In this framework, the IN^{2}UB aims at promoting, both internally and internationally, the collaboration among different groups and research centers by strengthening interdisciplinary activities which integrate both basic and applied research. The IN^{2}UB is thus participating in national strategic programs and in several international projects and actions as well.

The institute integrates six different research lines:

- Modeling and Simulation of Systems and Properties of Matter in the Nanoscale
- Nanobiotechnology
- Nanopharmacotherapy
- Nanomagnetism, nanoelectronics and nanophotonics
- Nanostructured Materials
- Nanoenergy

Since its creation, the researchers and staff at the Institute of Nanoscience and Nanotechnology have been working intently to favour the most suitable synergies among researchers by encouraging interdisciplinary activities that shall result in new frontier-knowledge projects and to encourage relationships between researchers and those corporations with an interest in the different applications of nanotechnologies, by stimulating the implementation of joint projects that shall suit the technologically challenging requirements of the business sector.

Moreover, the University of Barcelona offers the Master in Nanoscience and Nanotechnology, and a Doctoral Studies Programme in Nanosciences, which aim at providing students with a deep and oriented training in both the nanoscience and nanotechnology fields. Teaching is based on research activity, transfer of knowledge and the sharing of experiences and procedures. The academic staff belonging to the IN^{2}UB has a most singular role in these studies' teaching activities.

1 SCIENTIFIC ACTIVITY

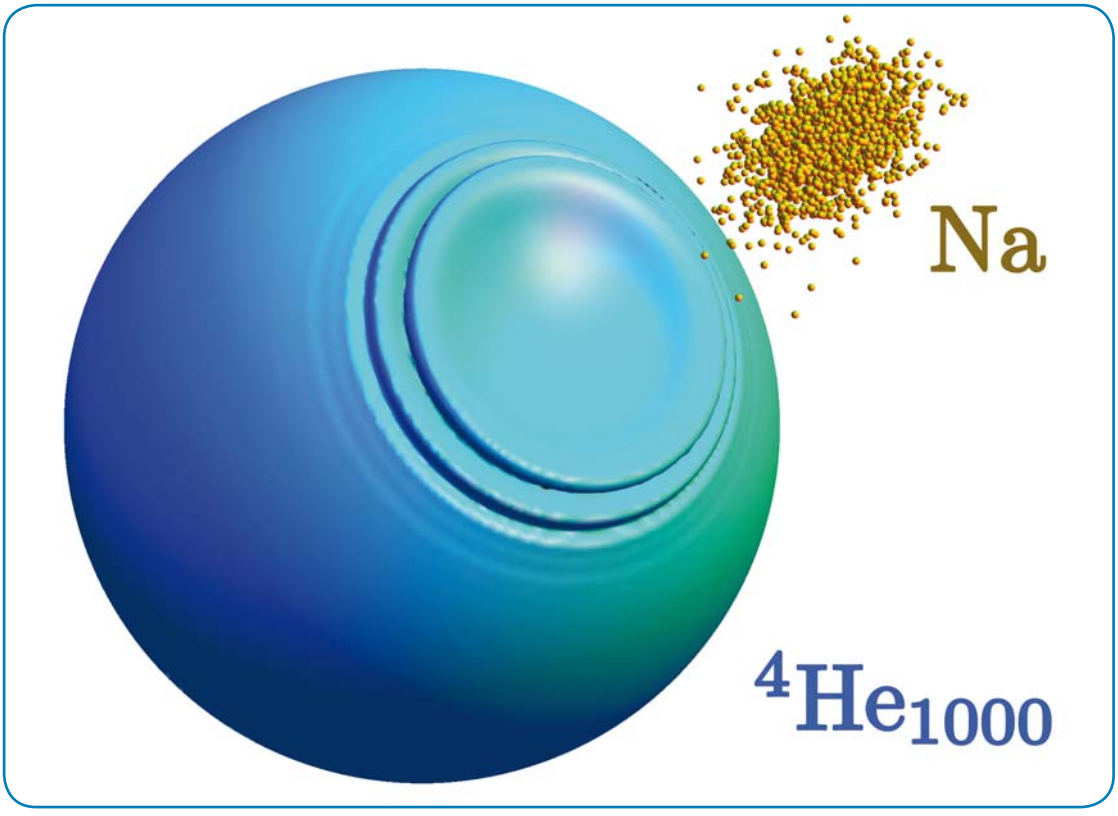
1.1. MODELING AND SIMULATION OF SYSTEMS AND PROPERTIES OF MATTER IN THE NANOSCALE

The research carried out by the **Theoretical Physics of Nanoscopic Systems Group** can be sorted in three different areas:

1. **Semiconductor Nanostructures:** through a full configuration interaction, the group has observed the existence of Fermi liquid and Wigner distribution in an elongated 3D nanocrystals subject to an inhomogenous spatial confining potentials.

2. **Bose-Einstein Condensates:** the group has studied the appearance of phase slippage and self-trapping in a self-induced bosonic Josephons junction, produced by the anisotropic long range dipolar interaction.

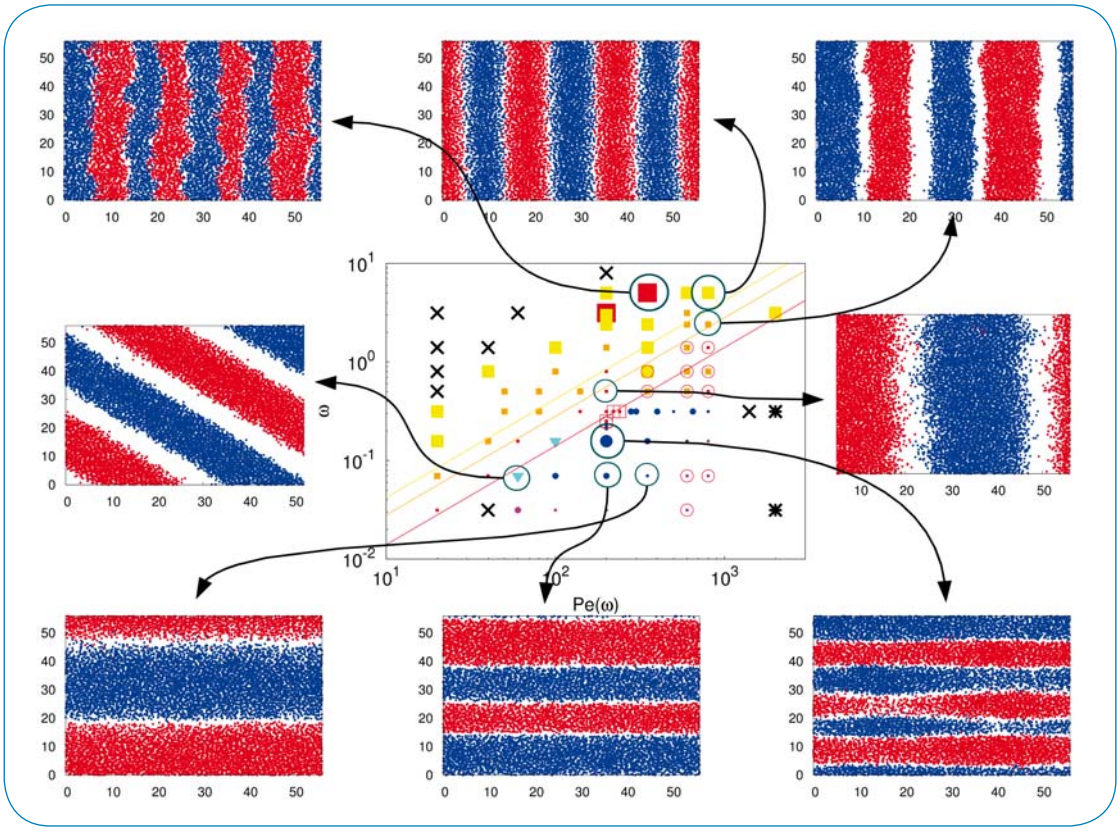
3. **Quantum Fluids:** through a time-dependent density functional formalism, the group has studied the desorption of alkali atoms from helium nanodroplets that compare very well with the experimental results obtained with a photoelectron spectroscopy.



^{4}He droplet doped with a sodium atom. The sodium atom is simulated with a test particles approximation (blue ones).

The **Nanosystems Statistical Physics Group** has been focusing on the study of several non-equilibrium-related phenomena and has explored different research lines:

1. An analysis of the magnetisation dynamics of nanoparticles at very short time scales has been performed. This analysis has led to predicting a new regime by which magnetisation performs a nutational motion which could be observed experimentally.



Phase diagram for a mixture of oppositely charged nanocolloids changed to an oscillating electric field. As a function of the oscillation frequency and amplitude strength of the external field (characterized by the effective colloid Péclet number) colloids with opposite charge (depicted with different color) separate into stripes that can change the number of observed stripes and their orientation with respect to the direction of the forcing filed. The observed patterns are sensitive to the hydrodynamic coupling among oppositely moving colloids.

2. It has been shown that thermodynamic quantities such as temperature cannot be defined consistently enough at very short length scales, and a lower limit for a thermodynamic description has been established.

3. Optimal resting-growth strategies of microbial populations in fluctuating environments have been studied.

4. An analysis of the protein crystal growth under non-isothermal conditions has been performed.

5. The role of nanocolloids in blockcopolymer phases has been analyzed. Through appropriate, newly developed computational coarse-grained approaches, it has been shown that the wetting properties of nanocolloids can be exploited to control the stability of lamellar phases and promote new morphologies and patterns.

6. A new computational approach has been developed to study the electrokinetics of nanocolloids in regimes of strong colloidal charges and strong fields. It has been exploited to identify the induced dynamic interactions between colloids in these nonlinear regimes, and to characterize these new dynamic interactions and their impact in the stability of non-equilibrium nanocolloidal suspensions.

7. The role of static and dynamic wetting on the stability of forced capillary fluid films has been analyzed. Exploiting coarse-grained, hybrid computational schemes we have identified a new instability mechanism which promotes drop emission on heterogeneous slid substrates. This mechanism, based on the affinity of the forced liquid to the solid substrate, opens the possibility for the development of new approaches to control drop emission and transport in microfluidic devices.

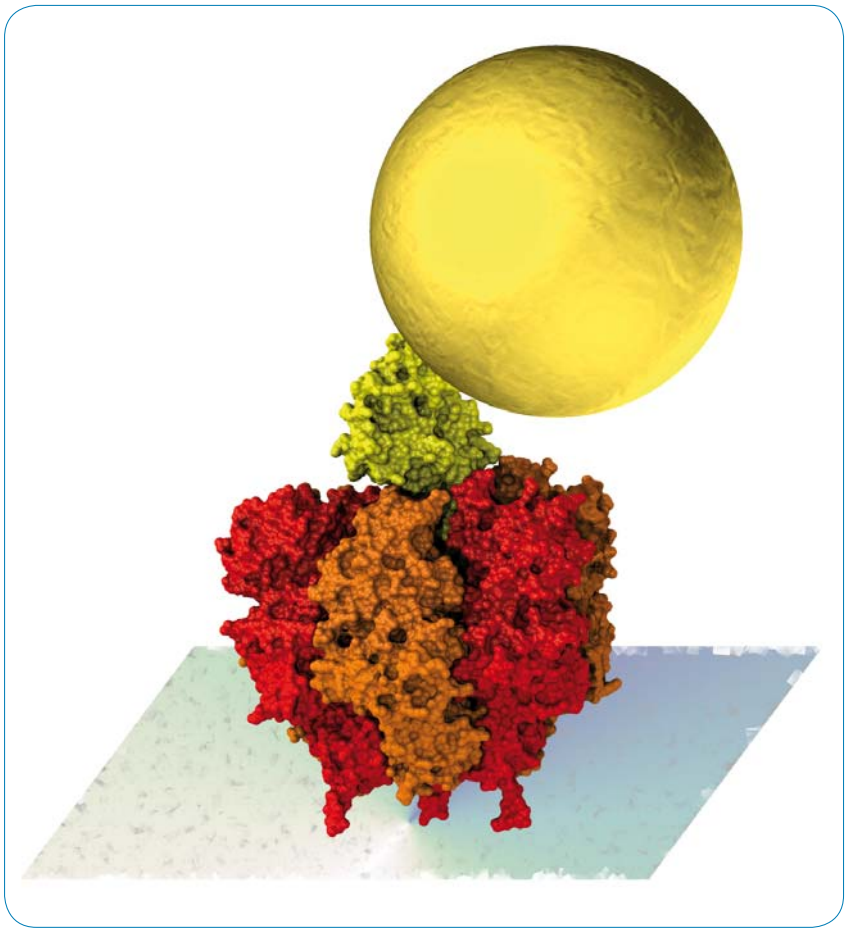
8. The structures induced by an oscillating field on charged nanocolloidal mixtures have been considered. The group researchers have shown that the interaction of colloids through the solvent affect the relative stability of segregated structures and have a direct impact in how the forcing external field orients the stripes of colloids.

1.2. NANOBIOTECHNOLOGY

The research carried out by the **Non-linear Physics in Nanobiophysics Group** can be summarized as follows:

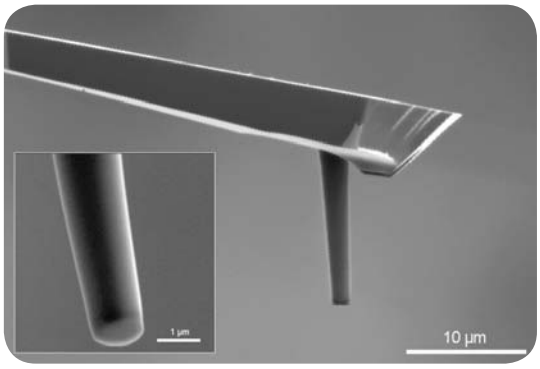
As far as the biophysics area is concerned, outstanding results have been obtained in some relevant subjects, such as the study of the molecular motor F1-ATP dynamics, theoretical modeling based on stochastic, differential equations, and the comparison between the theoretical and the experimental results. Moreover, predictions have been made, still pending of further experimental testing. The developed models include both the mechanical part of the models and the enrgetic one, derived from the ATP hydrolisis. Regarding neurophysics, it is worth mentioning that a series of works have been carried out on the synchronization of neuronal models and its role in signal transmission.

With regard to Brownian movement, it has been shown, by means of extensive simulations, that some anomalies exist concerning both transport and diffusion within Brownian non-interacting particle systems when in movement on surfaces which present a certain degree of disorder. In that sense, three different regimes have been defined: subtransport, subdiffusion i superdiffusion.



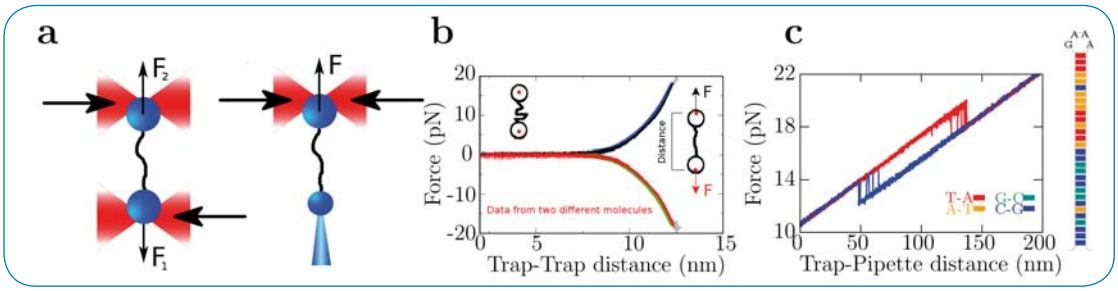
F1-ATPase Molecular motor with a sphere coupled to its axis, in order to observe its rotational movement.

Mechanical properties of cells play a critical role in many essential biological functions including migration, contraction, differentiation and gene expression. Moreover, cells sense and respond actively to adhesive forces and deformations exerted by the adjacent cells and the extracellular matrix (ECM). The **Biophysics and Bioengineering Unit** applies nanotechnologies to probe the mechanical properties of molecules, cells and ECM-rich gels at the nanoscale. Nanomechanics of neutrophils have been measured with atomic force microscopy (AFM) in healthy subjects and in patients with advanced hypoxemic chronic obstructive pulmonary disease before and after bilateral lung transplantation. Using flat ended cylindrical AFM tips nanofabricated with focused ion beam technology, the unit researchers have probed integrin-specific mechanoresponses to compression and extension in lung cells. Nanorheological properties of thin samples of lung ECM obtained from rats have also been probed by applying small amplitude oscillations over a wide frequency range. Using AFM in image mode, the topography and pore size distributions of ECM gels used in 3D cultures has been characterized.

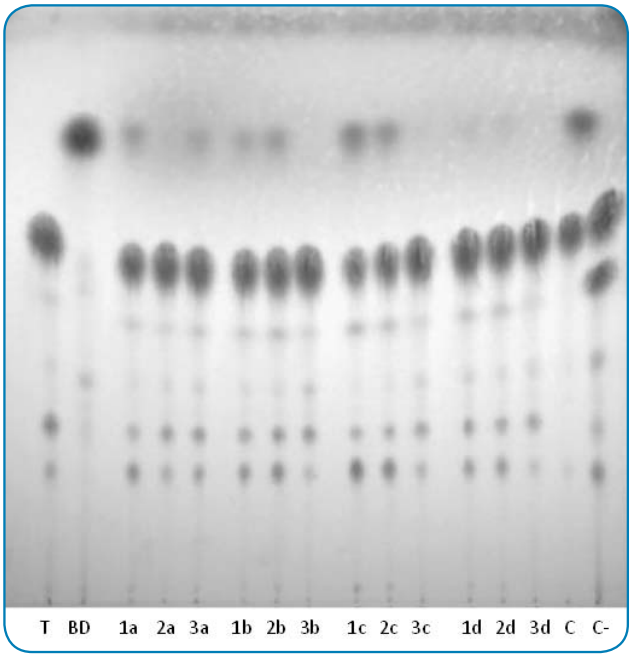


Flat ended cylindrical AFM tip nanofabricated with focus ions beam technology used to probe cell mechanics to compressive and tensile forces.

The researchers working at the **Small Biosystems Lab Group** have studied further DNA and RNA individual molecules. The group has also published several articles on DNA and RNA dynamic spectroscopy of forces and on the energetics of the nucleic acids, as well as on other subjects related to the study of individual molecules. It is also worth mentioning that new forms of short molecular handles have been introduced.



Pulling experiments with optical tweezers.
a. Counter-propagating dual and single trap setups.
b. Force-distance curves measured in a dual-trap for a 24kb dsDNA.
c. Force-distance curves measured in a single trap for a 30bp hairpin.

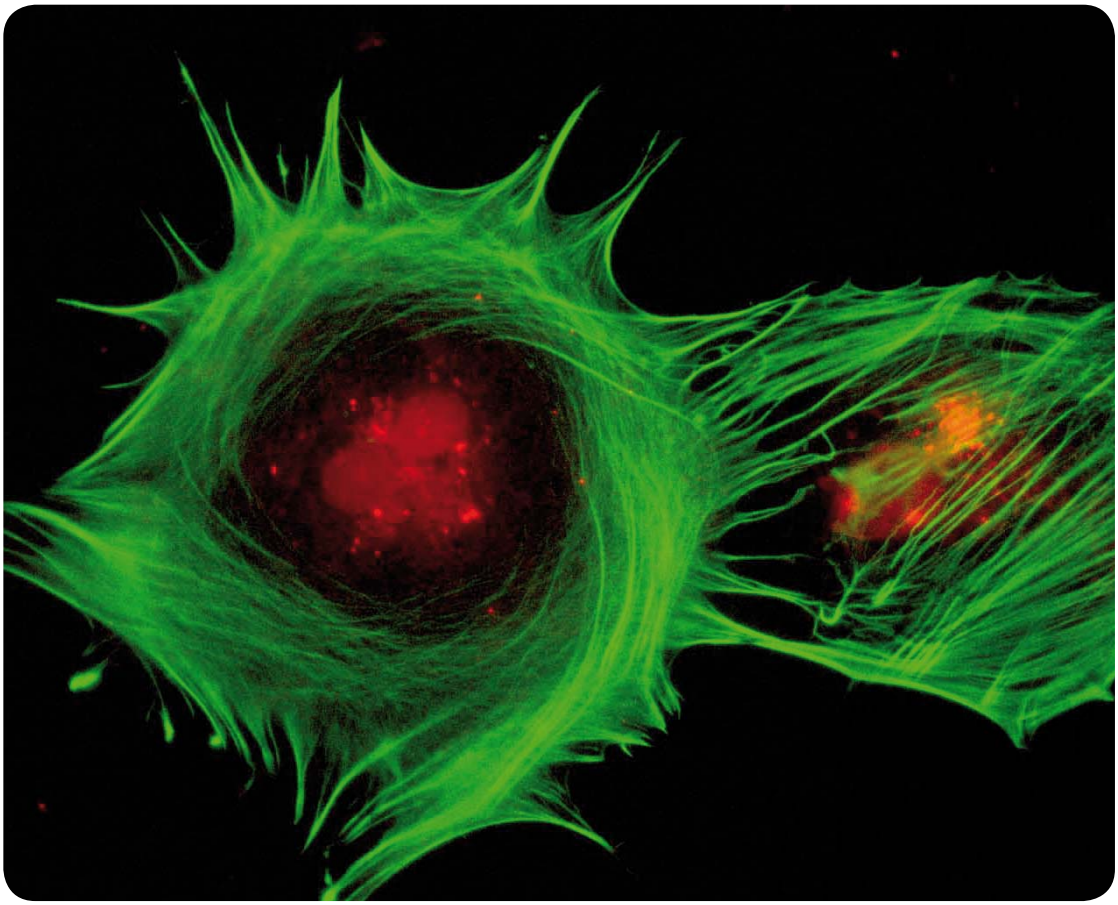


Thin Layer Chromatography (TLC) of the transesterification products released from Triolein (T, Sigma) by LipC lipase of Pseudomonas sp. 42A2 immobilised on MP-1000 (lane 1), EP-100 (lane 2) or Celite (lane 3). The transesterification reactions were carried out in 3% (lanes a), 5% (lanes b), 10% (lanes c) or 15% (lanes d) of water, containing 16% methanol slowly added. The FAMEs produced by CalB lipase (C) and a biodiesel sample chemically synthesised (BD) are shown as controls.

The **Microbian Enzymes for Industrial Applications Group** has recently developed new enzymes to be used in hydrolysis, synthesis, and/or biotransformation of natural polymers and chemical compounds. In this sense, molecular studies of glycohydrolases and lipases have been done. The group has worked as well towards isolation, design and improvement of enzymes for biotechnological uses, such as paper bleaching and recycling, production of biofuel, synthesis of new compounds from waste materials, and the developent of new materials from a lignocellulose, or a lipid-derived basis. The group has also achieved the biochemical characterisation of lipases, cellulases and xilanases, improving at the same time its genetic handling. This is a work which implies basic studies related to the sampling, cloning, and purifying of enzymes, as well as structure-function or protein-engineering more advanced studies.

Along the past year, the work of the **Intracellular Compartments and Membrane Trafficking Group** has involved the biochemical pathway that leads to the synthesis of phospholipids in the secretory membrane trafficking as a regulatory source of diacylglycerol (DAG). This work links with the involvement of the lipid phosphate phosphatase (LPP3) in the early secretory pathway, an enzyme that dephosphorylates phosphatidic acid to form DAG. On the other hand, the grup has extensively collaborated with the laboratories of Dr. G. Baldini and E. Giralt. With the former, secretory trafficking impairments in hepatocytes that express a mutant form of alpha-1-antitripsin –a protein necessary

for liver physyology and whose disfunction causes hepatoma–, have been reported, while an in vitro model of blood brain barrier (BBB) has been provided to the latter group, in order for them to assay the internalization of functionalized nanoparticles by the clathrin-dependent route. Regarding the molecular mechanisms by which ethanol produces harmful effects on the cytoskeletal organization of astrocytes, new insights have been provided, and the precise subcellular localization and secretory transport functions in the Golgi complex of beta III spectrin –a protein which actively participates in its characteristic flattened membrane architecture– has been reported.

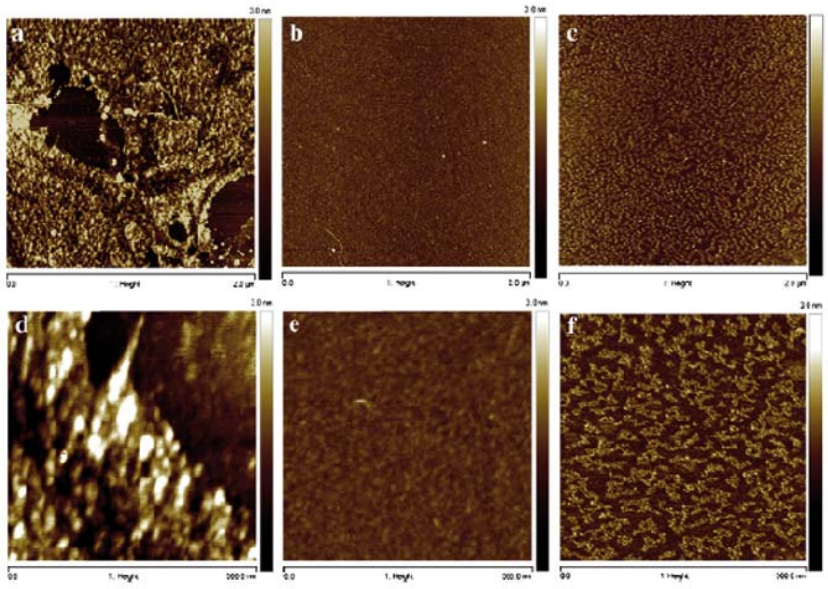


Primary cultures of cortical newborn rat astrocytes, exposed chronically to ethanol (199mM - 7 days) and transfected with siRNA. Stained with phalloidin (green, F-actin), fluorescent siRNA (red) and DAPI (blue, nucleus).

The researchers of the **Peptides and Proteins: Physicochemical Studies Group** have been focusing their work on two main research lines.

1. The study of surface active properties of GBV-C peptides from the point of view of their self-aggregation properties and their interaction with membranes at the nanoscale level. The main objective is the study of the potential of these peptides in the inhibition of the fusion process caused by the HIV fusion peptide.

2. The performance of biophysical and microbiological studies of multifunctional, polycationic peptide constructions with membrane activity.



LB films of 2x2 μm (top) and 500x500 nm (bottom) at an extraction surface pressure of 10mN m^{-1} : a) and d) E1 (64-81); b) and e) HIV -1 FP; and c) and f) E1 (64-81): HIV -1 FP at a molar ratio of 0.6:0.4. (BIOCHIMICA ET BIOPHYSICA ACTA-BIOMEMBRANES Volume: 1808 Issue: 9 Pages: 2178-2188 DOI: 10.1016/j.bbamem.2011.05.020).

The **Supramolecular Systems in Nanobiomedicine Group** has developed work in the synthesis and functionalization of gold nanoparticles (AuNP) with: **i)** new thiol functionalized porphyrines, active in photodynamic therapy, and **ii)** cyclic peptides, with antimicrobial and anticancer activity (**Fig.1**). The group is also responsible for the (bio)functionalization of microtools to tag cells and determine intracellular parameters (**Fig.2**), and also to study the interaction between receptor molecules and ligands using a novel tunning fork system. Also, we used gemini amphiphilic systems to obtain nanostructured gels that will be studied for drug delivery (**Fig 3**).

Fig.1:

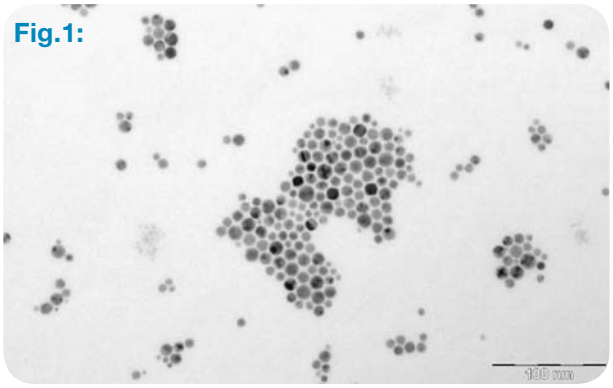


Fig.2:

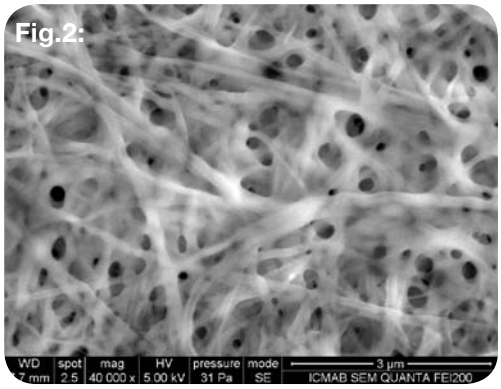


Fig.3:

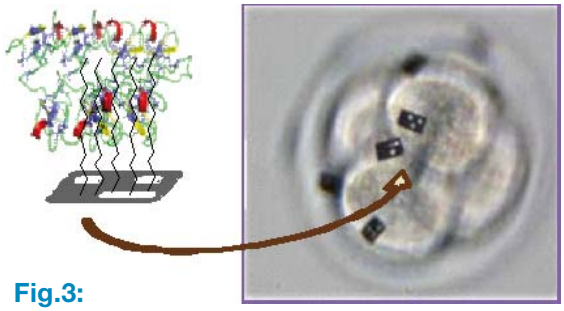
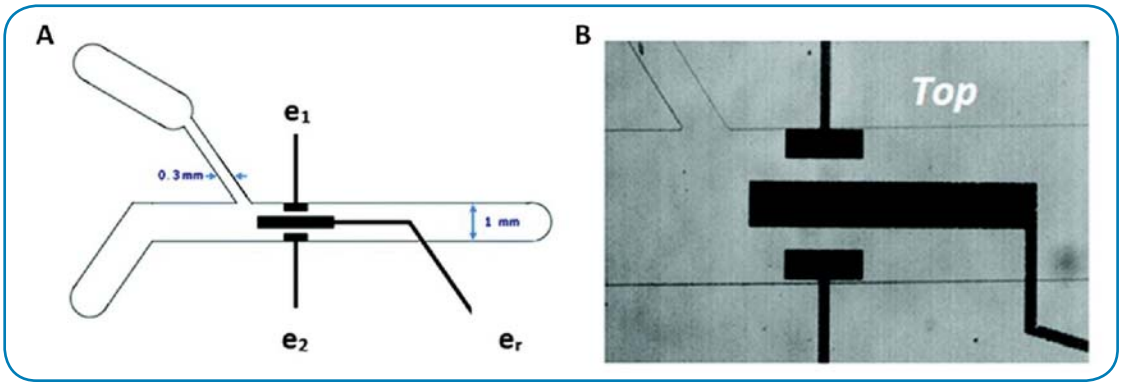


Fig.1: *TEM micrograph of functionalized AuNPs.*
Fig.2: *Biofunctionalized microbarcodes for embryos tagging.*
Fig.3: *SEM migrograph of a drug loaded nanostructured gel.*

The **Nanobioengineering Group** is a truly multidisciplinary team working in the application of nanotechnology to the development of new biomedical systems and devices, mainly for diagnostic purposes. The main activities of the group involve the physical and chemical functionalization of materials for the study of biomolecule and cell interactions and for the development of new biosensors integrated in lab-on-a-chip devices. The technology and results obtained in the laboratory are employed in medical applications ranging from portable diagnosis devices to implantable prostheses for regenerative medicine purposes.

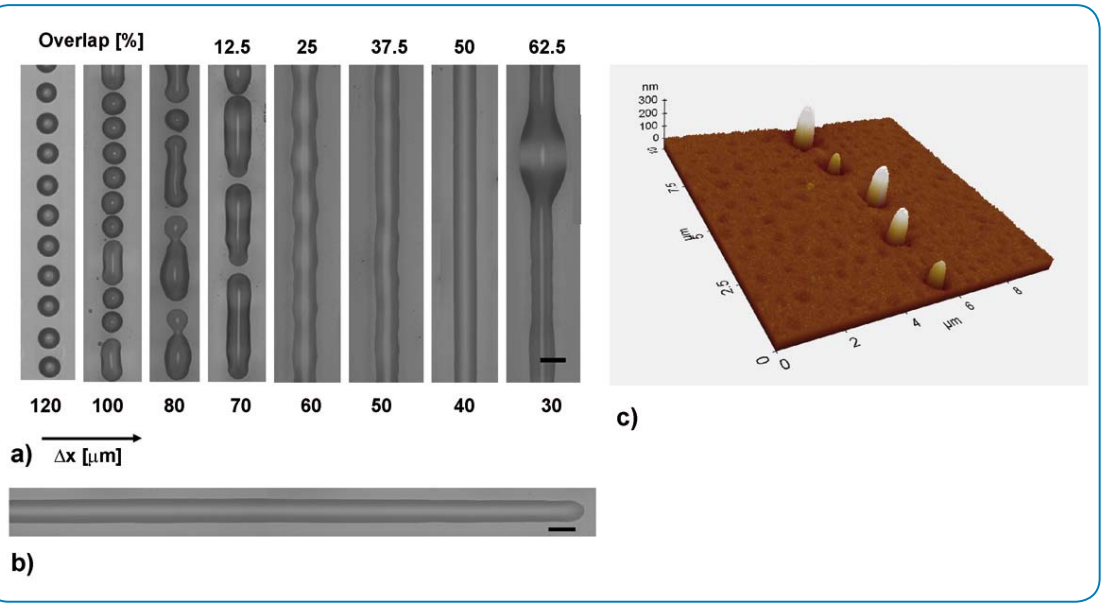


Schematics (A) and microscopic image (B) of a microfluidic device with 3 integrated biosensors.

The research carried out at the **Laser Processing Group** along the 2011-12 period has been focused on the two lines in the field of laser microfabrication which constitute the main activity of the group: laser microprinting, and laser scribing of transparent materials.

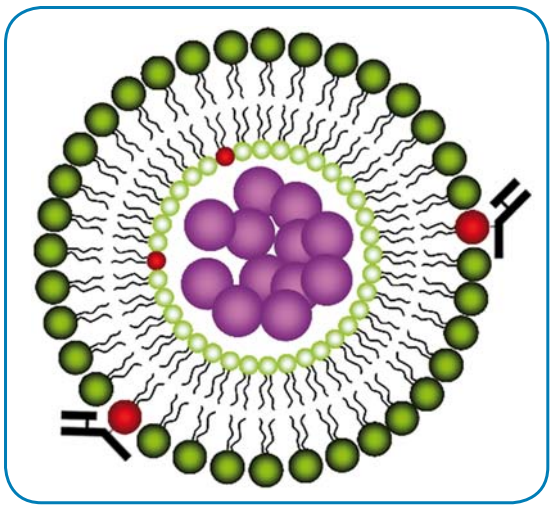
Laser microprinting: We have investigated the performances of the technique for printing lines of inks with high-resolution. Several process parameters, like drop overlap or laser fluence have been analyzed systematically. In addition, we have studied the possibility of applying the technique to the preparation of miniaturized odor sensors.

Laser scribing: We have developed a method to control the position of the focus of a femtosecond laser beam on a transparent material with accuracy better than 0.5 μm. The method, which operation principle relies on the highly non-linear interaction of ultrashort pulses with materials, allows obtaining features with extremely high resolution in a very reproducible way.

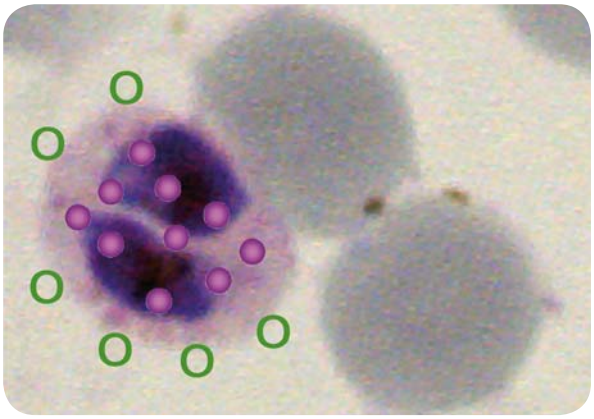


a) *Laser-printed lines displaying different morphologies depending on the overlap (Δx) between adjacent droplets and* ***b)*** *2 mm long line printed at a 40 μm overlap (scale bar is always 50 μm).* ***c)*** *Swelling on PMMA induced by femtosecond laser irradiation.*

The **Group for the Study of Biomolecular Interactions** has been focusing on the development of nanosystems intended to establish new therapies against malaria, including strategies based on the single-molecule force spectroscopy for the identification of new antimalarial and antibiotic agents and the design of nanovectors suitable for drug release against malaria. This includes the study of metabolic pathways present in the parasite causing malaria but absent in humans, with the aim of identifying specific enzymes as therapeutic targets. Another line of research includes the study of amyloid fibers as a new material for the fabrication of coaxial nanowires as possible new targets for vaccines.



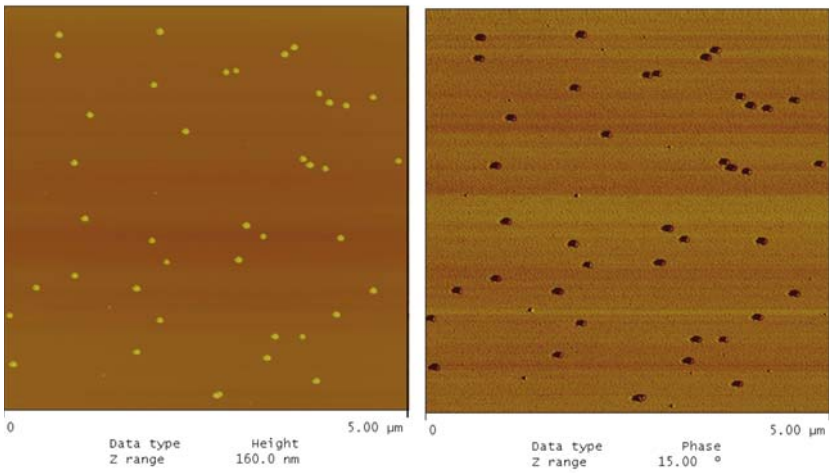
Cartoon of a quantum dot-containing liposoma functionalized with half-antibodies against Plasmodium falciparum-infected red blood cells.



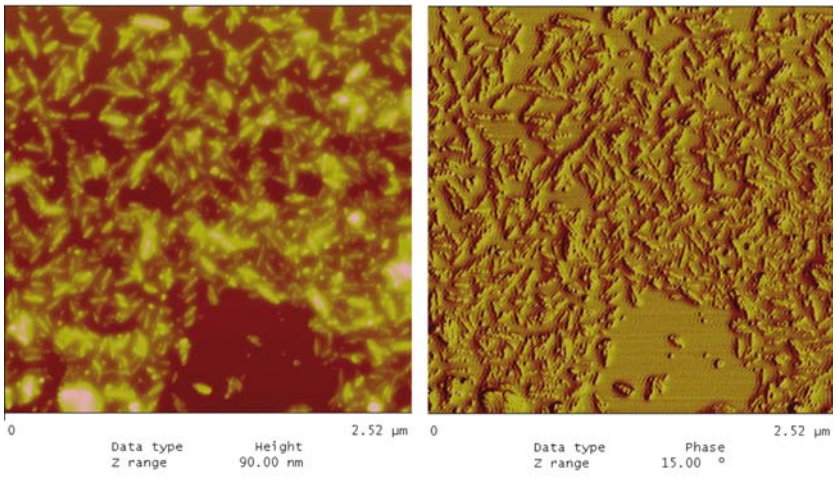
A graphical scheme of the performance of such inmunoliposomal nanovector when added to a P. falciparum culture containing both infected and non-infected cells.

1.3. NANOPHARMACOTHERAPY

The **Drug Development within Nanostructured Systems** has been working with biocompatible polymeric meso/macroporous materials and nanoparticles, using highly-concentrated emulsions and nano-emulsions as templates. These nanosystems can be used as implants for controlled drug release. The group is currently exploring the development and characterization of crosslinked self-assembled nanostructures for the treatment of arthritic diseases and hepatic pathologies. The research group has also been working in the analysis of the mechanisms involved in the freeze-drying process of polymeric nanostructured systems, determining the collapse temperature by thermal analysis and freeze-drying microscopy. The incorporation of nanostructured lipid carriers to semisolid formulations for improve topical adhesion has also been studied.



Microscopy images of polyurethane nanoparticles prepared in O/W nano-emulsions.

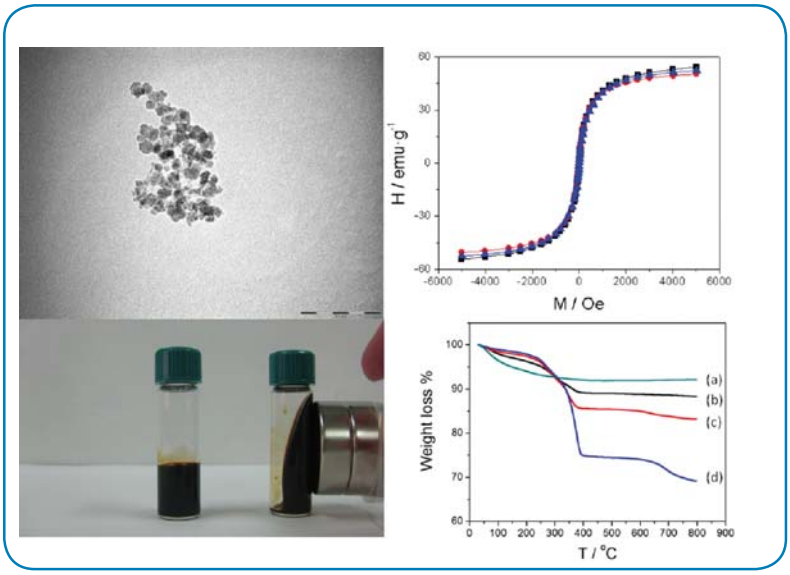


Atomic Force Microscopy images of streptavidine crystallization.

The **Drug Design and Response-evaluation within Pharmaceutical Nanostructured and self-ordered Systems Group** has mainly focused on the in vivo evaluation of polymeric poly lactic-co-glycolic acid nanoparticles (PLGA) containing tricyclic antidepressants. Specifically, the analgesic and anti-allodynic effects of these systems have been evaluated after their subcutaneous administration in healthy rats by means of thermal stimulation (plantar test), and in rats with sciatic nerve chronic constriction injury, respectively.

Simultaneously, the group has worked with magnetic liposomes developed by the Department of Physical Chemistry of the Faculty of Pharmacy of the UB. In this case, the group has worked with a model-developed inflammation in mice, and has studied the biodistribution of iron from the magnetoliposomes administered intravenously, both in the presence and in absence of an external magnetic field. Finally, in collaboration with the CSIC, permeation in human skin of clindamycin formulated in highly-concentrated emulsions has been studied.

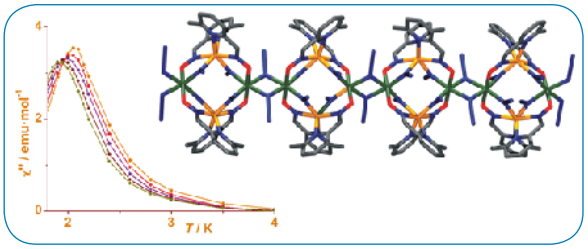
The **Colloids Group** has been working with magnetic particles based on iron oxides (ferrofluids and magnetoliposomes). Such nanoparticles have been used in hyperthermia and ablation therapies. In both cases, materials mimicking the tumor tissue (the so-called phantoms) were used. For hyperthermia studies, magnetite nanoparticles stabilized with polyetylenglycol, and an external magnetic waveguide, as a source of radiation, were used, whereas for thermal ablation, the same ferrofluid alone or encapsulated in liposomes, and a radiation of 2.45 GHz were used. On the other hand, the effect of an external magnet on the biodistribution of magnetoliposomes in mice was also studied. Simultaneously, the group has been working with liposomes and has performed the following studies: **a)** effect of the surface charge of artificial model membranes on the aggregation of amyloid ß-peptide (related to the Alzheimer's disease), **b)** the interaction with platelets of liposomes bearing fibrinogen, and **c)** the role of the electrostatic depletion attraction on the structure of charged liposome-polymer mixtures.



Properties and characteristic of a ferrofluid formed by magnetite stabilized with polyethylenglycol.

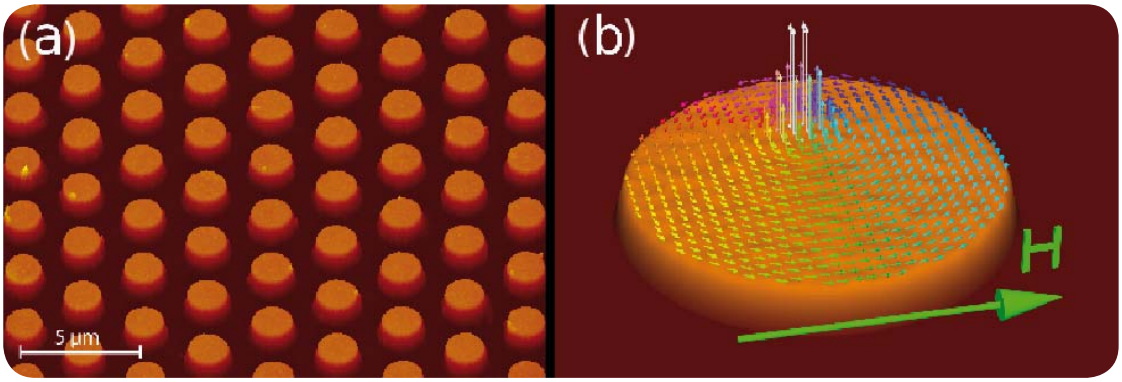
1.4. NANOMAGNETISM, NANOELECTRONICS I NANOPHOTONICS

The main target of the **Molecular Magnetism Group** has been the design of discrete systems with high nuclearity or 1D compounds with single-molecule/chain magnet response (SMM/SCM). The research has been mainly focused on anisotropic cations as the NiII, MnIII, IV and occasionally lanthanides, with the aim to obtaining high nuclearity systems (nanomolecules) with a ground state of maximum multiplicity spin and high anisotropy able to show the SMM/SCM properties. The bridging ligands which offered best results have been phosphonate ligands and the polytopics pyridyl-oximates, often combined with azido bridges. The group is starting as well an innovative line of work focused on supramolecular aspects of magnetic systems as the encapsulation of anions in clusters derived of oximate ligands.



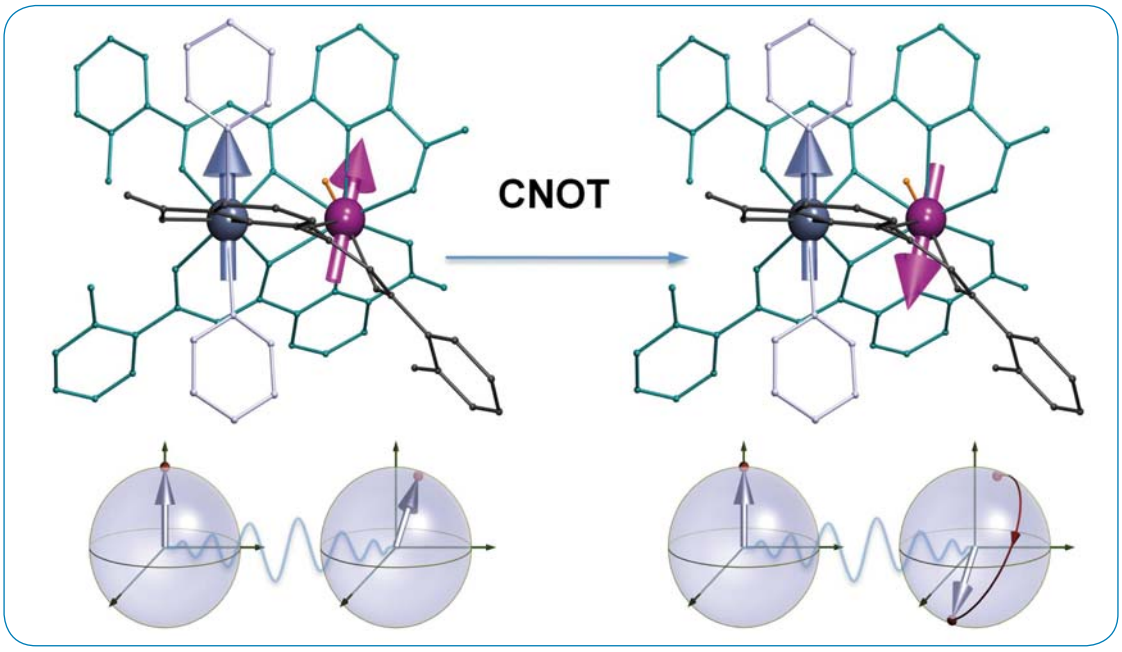
An example of one manganese Single-Chain Magnet built from ferromagnetic clusters, with local ground state S = 9, linked by end-on azido and oximato bridges.

In the field of magnetic materials, the **Magnetism Group** has focused on the study of the quantum dynamics of the vortex state induced in micrometre-sized permalloy disks by the application of a magnetic field in the plane of the samples [Phys. Rev. B 85, 180401 (2012)]. The time evolution of the magnetization of these materials has been interpreted as quantum tunneling of the vortex core through the pinning barriers associated with the presence of structural defects. In the field of superconductors, the group has investigated the effect of the application of a magnetic field on the quantum magnetic relaxation in a disk-shaped type-I lead sample [Phys. Rev. B 85, 064506 (2012)]. The results have been discussed in the framework of a theorerical model developed in collaboration with Prof. Eugene Chudnovsky of the City University of New York in which the time variation of the magnetization is described in terms of the motion of nanometre-sized interfaces between normal and superconducting zones in the intermediate state.



(a) *AFM image of the array of permalloy disks studied. The angle of the perspective view is 45º.* ***(b)*** *Spin field of the vortex state in one of the permalloy disks considered in (a). The vortex core is displaced transversely to the direction of the applied field, H.*

The **Magnetism and Functional Molecules Group (GMMF)** has during the period 2011-2012 received funding from the European Union (ERC Starting Grant), which represents a major step forward both in terms of recruitment and of acquisition of new infrastructure. Thus, the group has gained access to 60 m^2 of additional laboratory space and has acquired a single crystal X-ray diffractometer. Some of the most relevant highlights for 2011-2011 are **i)** The generation and study of systems coupling spin crossover processes coupled to crystallographic phase transitions (See Chem., Eur. J. 2011, 17, 8264 8268, cover; Angew. Chem. Int. Ed. 2012, 51, 2142-2145), **ii)** The preparation of design coordination clusters for Quatum computing (eg, Chem. Commun. 2012, 48, 14131415; Inorg. Chem. 2012, 51, 8441-8446; Chem. Soc. Rev. 2012, 41, 537546, cover) and demonstration of a CNOT requirements based on molecular spin and SWAP Quantum Gates (See Physical Review Letters, 2011, 107, 117 203 and Figure), **iii)** The preparation of photochromic ligands for the construction of photomagnetic systems.



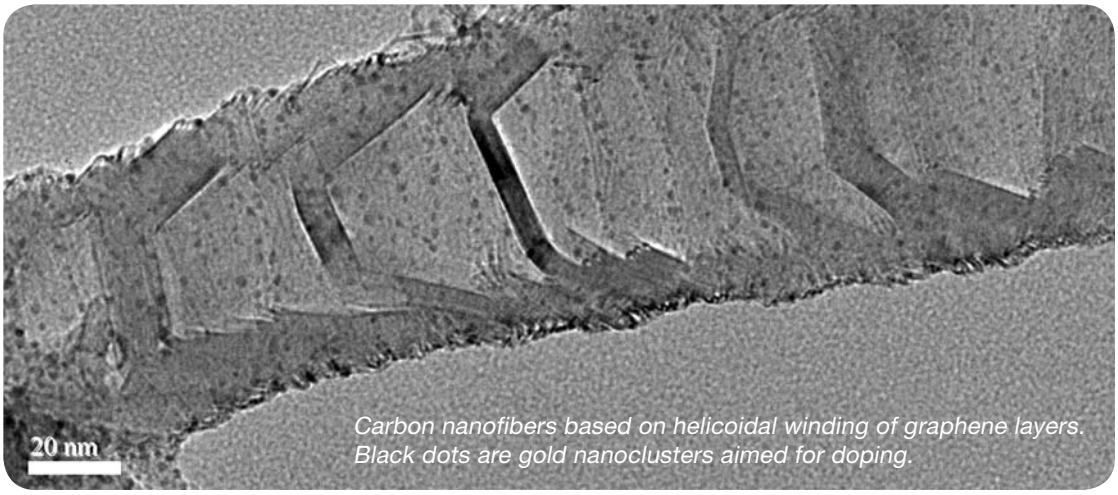
Representation of a CNOT operation as realized by a [Tb(III)2] molecule by manipulation of its electronic spins. Below is a scheme of this operation in form of rotations of the spins embodying the qubits.

Research carried out by the **MIcro-nanoengineering and Nanoscopies for photonic and electronic Devices Group (MIND)** has been developed in different and complementary fields.

The **Nano and Microtechnologies Unit** has developed nanodevices and systems based on nanostructures, in order to fabricate a new class of advanced chemical sensors.

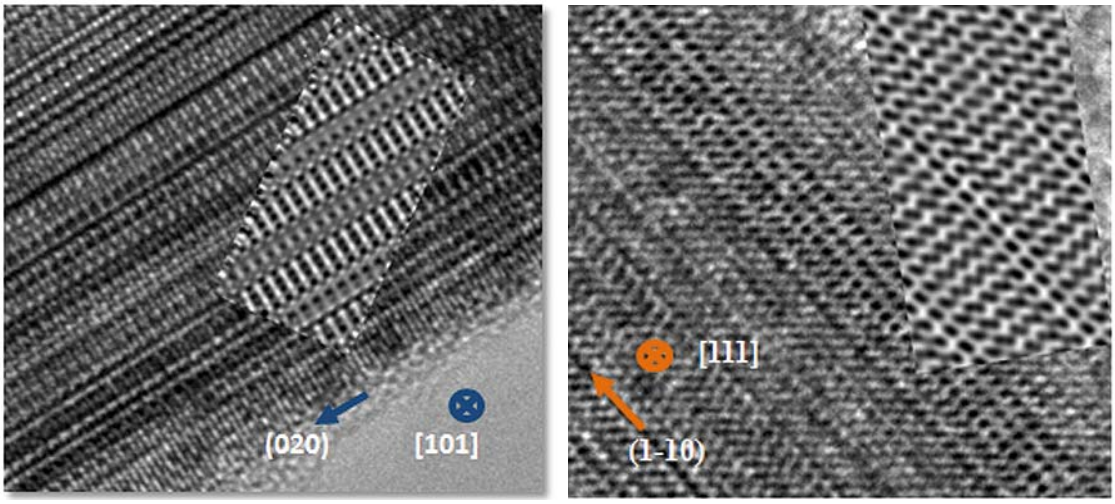
SEM image of a SnO2 gas nanosensor fabricated on top of a microhotplate. The inset corresponds to an enlargement of the red square in the image and allows to see the 50nm-thick SnO2 nanowire contacted using focused electron beam assisted deposition.

As a part of the same group, the **Applied Nanoelectronics Unit** has focused its research on sensors, printed electronics and simulation. The development of sensors has continued, based on previous knowledge on monolithic ceramic technology for rigid devices in the framework of project Nanomat. Besides, flexible devices were developed for project Infinitex. Both approximations take advantage of the reactivity of certain nanostructures, like metal oxide nanofibers or carbon nanofibers -see figure-, as sensing materials. For the development of these sensors at the nanoscale, advanced inkjet printing technology was set-up. Such a development and deep knowledge on printed electronics allowed the unit to propose the use of inkjet for passive applications in different fiels (projects Thermprint and Trilobits) and for active applications. In fact new printed transistors based on graphene are expected in the next year. Finally, the unit has continued his strategy on simulation by the development of an advanced tool for first-principle compute of the transport of quantum dots.



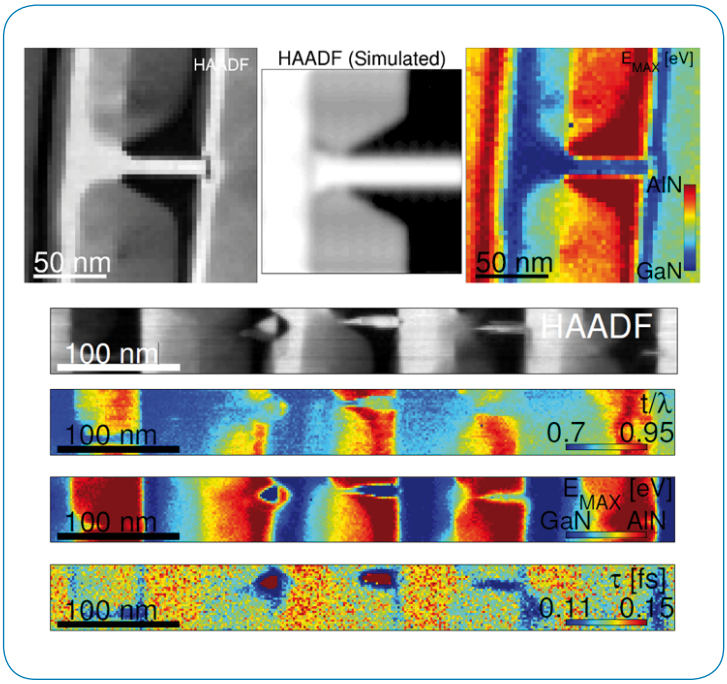
Carbon nanofibers based on helicoidal winding of graphene layers. Black dots are gold nanoclusters aimed for doping.

Also within the MIND group, the **LENS (Laboratory of Electron Nanoscopy) team** has been actively working in several lines. From the point of view of instrumentation development, the main focus has been the combination of advanced operational modes in Transmission Electron Microscopy. Starting with an innovative approach using electron Tomography and Electron beam precession in imaging mode, the combination Electron Energy Loss Spectroscopy with Electron Tomography and Electron Beam Precession (this latest mode giving rise to an international patent application 12160112.4-221) has extended the research field to advanced modes in analytical electron microscopy.

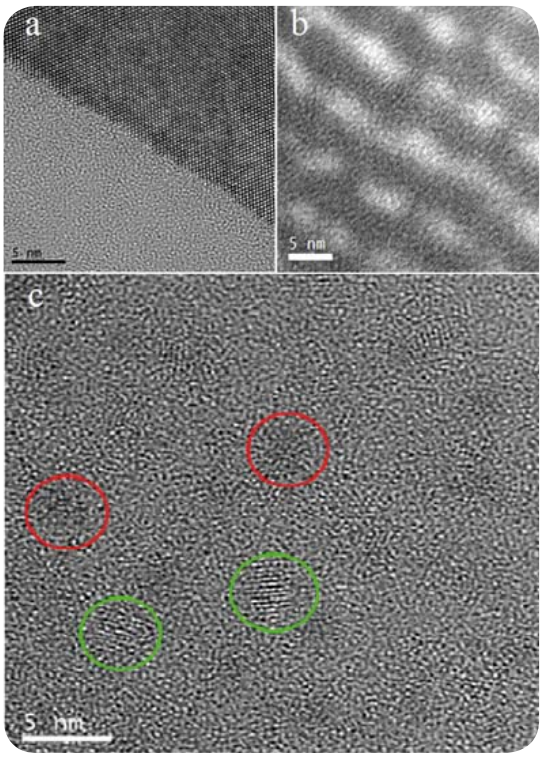


Experimental and simulated high resolution TEM images of Nb_2O_5 nanowires used as humidity sensors.

Mathematical protocols have also been developed to extract quantitative information from low loss EEL regime to retrieve significant properties of materials as chemical composition and dielectric function through plasmon analysis.



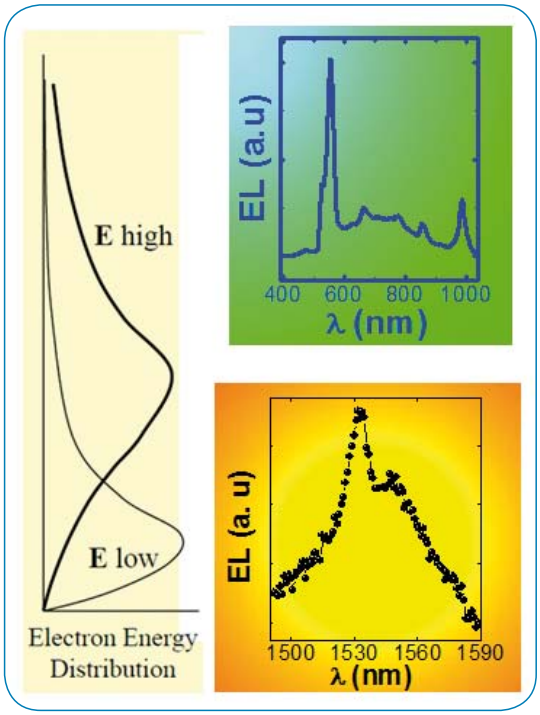
Chemical segrations in III-V nitrides heterostructures for optoelectronics, identified by plasmon analysis and image simulation: E_{max} is plasmon energy position, t/λ is foil thickness to mean free path ratio, and τ is the life time of the damped plasmon in the different materials.



From the point of view of materials science and technology, LENS has been collaborating in national and international contexts in structural and chemical sub-nanometer / atomic resolution characterization of materials and devices in the field of: **i)** tandem solar cells based in Si nanocrystals; **ii)** proton conducting materials for solid oxide fuel cells; **iii)** complex oxides core-shell magnetic nanoparticles for biomedical applications; **iv)** biferroic materials for spintronic applications; **v)** semiconducting nanowires for chemical sensors and **vi)** III-V nitrides for optoelectronic devices.

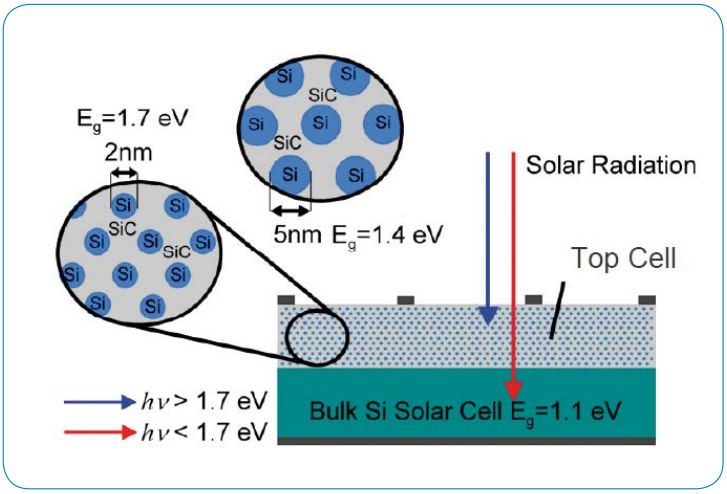
Si-nanocrystals for advanced tandem solar cells.

The **Electrophotonics Unit** of MIND is working on the IP EU project HELIOS: Photonics and Electronics Functional Integration on CMOS. Particularly, the unit has shown during this year a new type of integrated light emitters which can emit with high efficiency in the infrared and visible (see pictures). By a careful design and fabrication process, the integrated nanoLEDs have been coupled to a slot waveguide and to the exterior through a grating. Thus, the unit has been able to show that light in a Photonic Integrated Circuit (PIC) can be generated, distributed and coupled. The light is in the visible and infrared in devices with only few tens of nm. Er ions are coupled to Silicon nanocrystals in the active layers and are excited by the impact of hot electrons. A photon is emitted when they de-excite. So, these devices are of impact excitation type with a high V threshold.



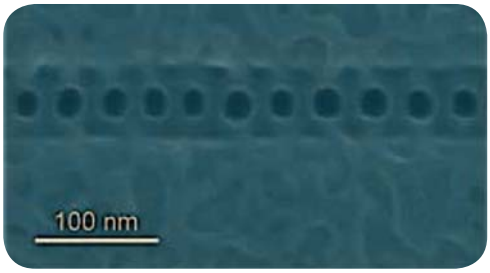
Electroluminescence spectra in the visible and infrared range.

Moreover, and in collaboration with other members of the MIND group, the Electrophotonics Unit has continued this year their successful work in the STREP EU Project NASCENT: Nanostructured Tandem Solar Cells. The objective is to fabricate a double solar cell in which the upper part is made up of thin nanocrystalline layers of Si and/or SiC. The size of the nanocrystals is controlled to the atomic scale and thus due to quantum confinement effects, the band gap absorption of the upper cell can be taylored following the needs. We have estimated that a band gap of 1.7 eV maximizes efficiency of the overall cell for a Si bulk solar cell down.

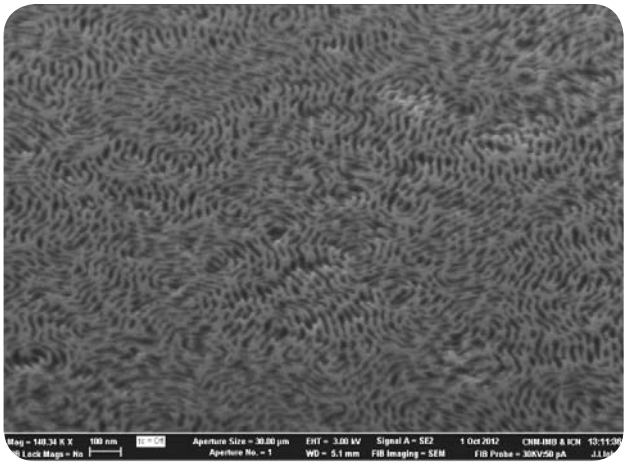


Section of a tandem soar cell with Si-nanocrystals.

Within the frame of the Nanoblock project, other researchers from the MIND group have explored the fabrication of higly ordered nanostructures for electronic and photonic nanodevices has been further developed using block-copolymer nanotechnology. By means of electron beam deposition, ion beam synthesis or reactive ion etching, the formation of organized nanoparticles and nanowires has been attained onto selected regions of submicrometric size, where the active area of the devices will be defined.



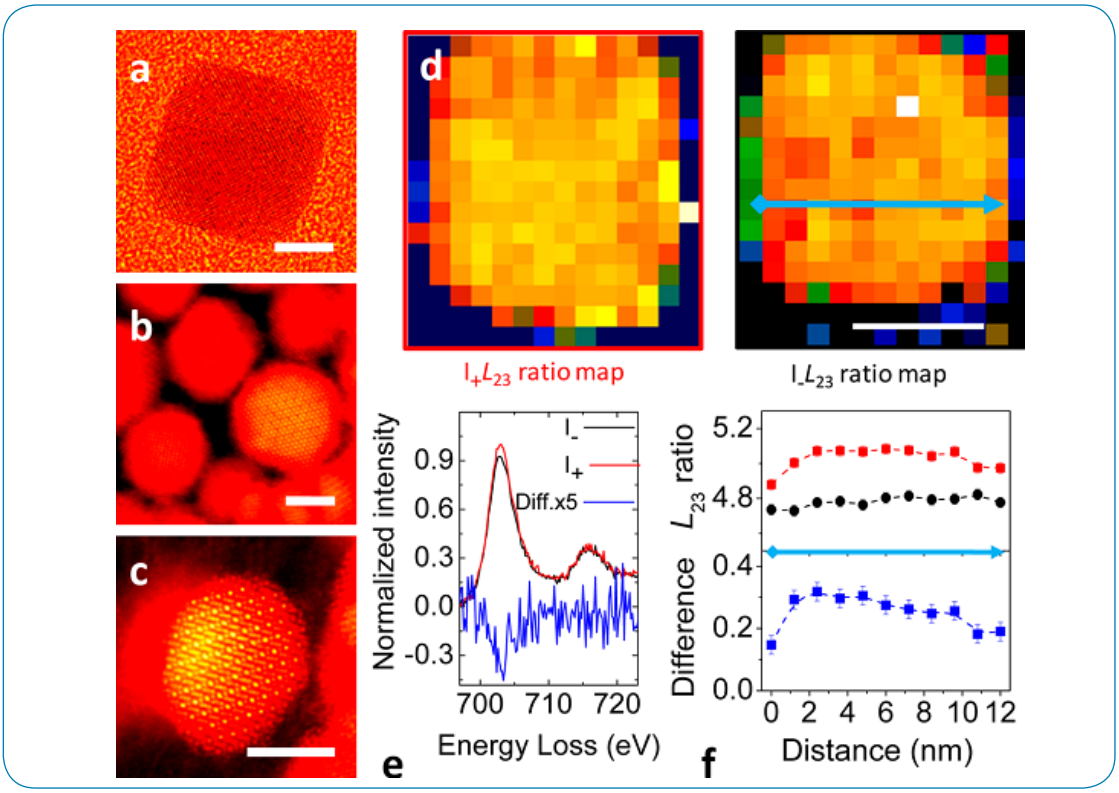
Silicon nanoparticles row deposited onto a nanotrench defined by means of graphoepitaxy.



Laminar silicon wires defined by reactive ion etching of 20 nm silicon layer patterned by means of a block-polymer etching mask.

The **Organic Materials Group** has been focusing on the study of a new family of organic molecules unprecedented in the literature, since they have magnetic properties despite the absence of both radical structures and metal atoms. It is remarkable that these systems maintain their magnetic order, at least, between 4 K, and room temperature. Sixteen new molecules were synthesized, designed with the aim of improving the properties of the first molecules discovered by the group. Of these materials, we studied their birradical character and magnetic behaviour, and we conducted a thorough computational study of its structure. As a result, the group has proposed a general structure for the design of birradical molecules with magnetic properties. The group is also preparing polymeric and dendrimer-structured derivatives of these molecules.

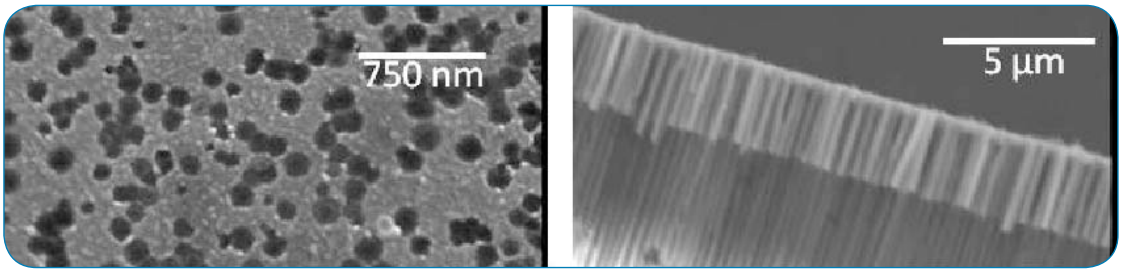
The **Magnetic Nanomaterials Group** has achieved during the past months a real-space characterization on the subnanometer scale of the magnetic, chemical, and structural properties of iron-oxide nanoparticles via aberration- corrected scanning transmission electron microscopy. For the first time, electron magnetic chiral dichroism has been used to map the magnetization of nanoparticles in real space with subnanometer spatial resolution. It has been found that the surface of the nanoparticles is magnetically ordered. Combining the results with density functional calculations, it has been established how magnetization is restored in the surface layer, and it is concluded that the nature and number of molecules in the capping layer is an essential ingredient in the fabrication of nanoparticles with optimal magnetic properties (*See Surfactant Organic Molecules Restore Magnetism in Metal-Oxide Nanoparticle Surfaces; Nano Letters 12 (2012) 2499*).



Real-space magnetization characterization with nanometer resolution. The scale bar represents 5 nm in all panels. ***(a)*** *Aberration-corrected STEM bright-field image of a Fe_3O_4 nanoparticle.* ***(b,c)*** *High-resolution Z-contrast STEM images of two Fe_3O_4 nanoparticles along the <111> and the <01$\bar{1}$> zone axes, respectively, showing high crystal quality. Nominal particle sizes are 9 and 5 nm, respectively.* ***(d)*** *Color-coded $L_{2,3}$ ratio maps obtained from the spectrum image of the nanoparticle shown in panel (a) acquired at symmetric positions in the diffraction pattern: I+ (left) and at I–, (right), respectively.* ***(e)*** *Averaged EELS spectra in the Fe $L_{2,3}$ edges, after background subtraction, for the nanoparticle shown in panel a measured at I+ and I– and the resultant dichroic signal (in blue), represented by the difference, which has been magnified by a factor of 5 in the Figure. This signal is magnetic in nature and stands for the magnetization of a single nanoparticle with sub-nanometre resolution.* ***(f)*** *Top: $L_{2,3}$ profile along the direction of the blue arrow in panel d (in red and in black for I+ and I– L_{23} ratio maps, respectively). Bottom: difference between I+ and I– $L_{2,3}$ ratios along the nanoparticle. This difference is magnetic in nature and is proportional to the local magnetization of a single nanoparticle with sub-nanometre resolution.*

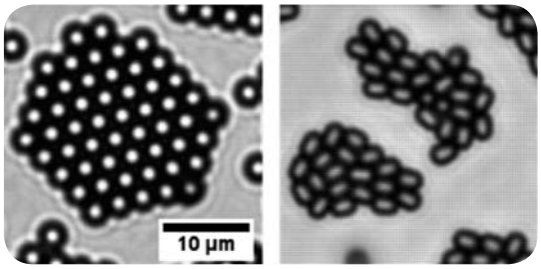
1.5. NANOSTRUCTURED MATERIALS

The **Thin-film and Metallic Micro / Nanostructures Electrodeposition Group** is mainly working in the use of electrochemical techniques to prepare alloys with potential uses in sensors and devices. The knowledge and control of the electrochemical process allows defining the best electrodeposition conditions to obtain micro/nanostructures of magnetic alloys. Recent work refers to CoPt and CoNi magnetic nanowires preparation with different aspect ratio, composition and crystalline phase. Also, news strategies to obtain structures with variable shape and size by means electrochemical method are being developed, including the using of microemulsions or adsorbed monolayers. The use of ionic liquids of new generation allows extending the possibilities of electrodeposition to the preparation of alloys as CoPt without hydrogen evolution interference or alloys containing rare earth elements, which are not available by electrodeposition in aqueous solutions.



Electrodeposited CoNi magnetic structures (porous films and nanowires of 20 nm of diameter.

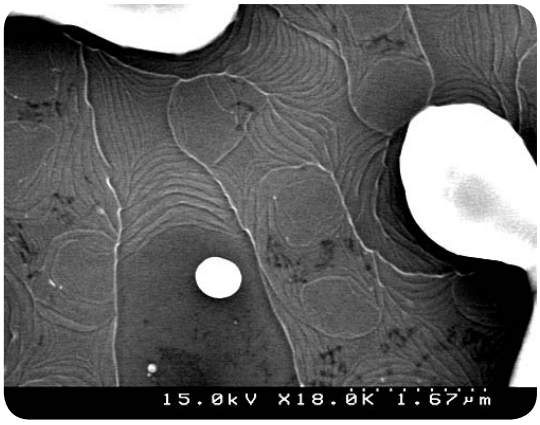
The **Self-organised Complexity & Self Assembling Materials Group (SOC&SAM)** develops basic research in the field of soft Nanotechnology, combining experimental studies in liquid crystals, colloidal systems, and monomolecular films of biomimetic molecules. Within the context of the latter type of systems, the group has shown that bottom-up chemical and top-down physical influences can be coupled arbitrarily to determine the chirality of a self-assembled supramolecular system, paving the way for new approaches in the development of chiral materials and processes. The group has also focused on the study of transport phenomena in two-dimensional micro-flows of surfactant monolayers, exploring different scenarios to enhance passive mixing. In the context of composite liquid-crystal/micro-particle materials we have explored different paradigms for controlled transport, such as the directed motion of passive micro-particles driven by non-linear electrophoretic effects in the anisotropic liquids or the direct manipulation of anisometric paramagnetic Janus micro-particles driven by a combination of external fields.



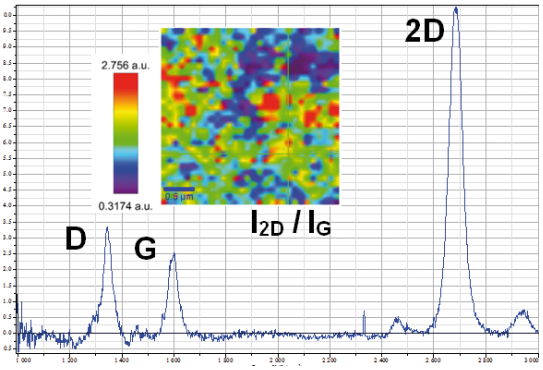
Confined colloidal plarticles self-assemble due to electrohydrodynamic interactions in the presence of an external alternate electric field. While spherical particles form ordered colloidal crystallites, anisometric particles arrange into complex non-compact morphologies.

The **Physics and Engineering of Nanostructured and Amorphous Materials Group (FEMAN)** has obtained evidences of graphene of very few layers at relatively large area, deposited by a new modified CVD method (project BIOGRAPH). The results of development of new materials have been reported in two doctoral thesis entitled: "Production and characterisation of Fe@ Cnanoparticles obtained by arc-discharge plasma" by Noemí Aguiló-Aguayo and "Producción de nanopartículas de si monodispersas obtenidas mediante plasma modulado" by María José Inestrosa Izurieta, both resulting from the projects NANOBIOMED and NANOTRAPPING respectively.

Further studies have been done on the possible applications of carbon nanotubes in the energy field (supercapacitors) and in the field of environment concerning the extremely high-surface nanostructured materials aimed at trapping specific pollutants.



Polycrystalline domains of few layer graphene deposited on a Cu/c-Si substrate produced by a modified CVD process at 900ºC.

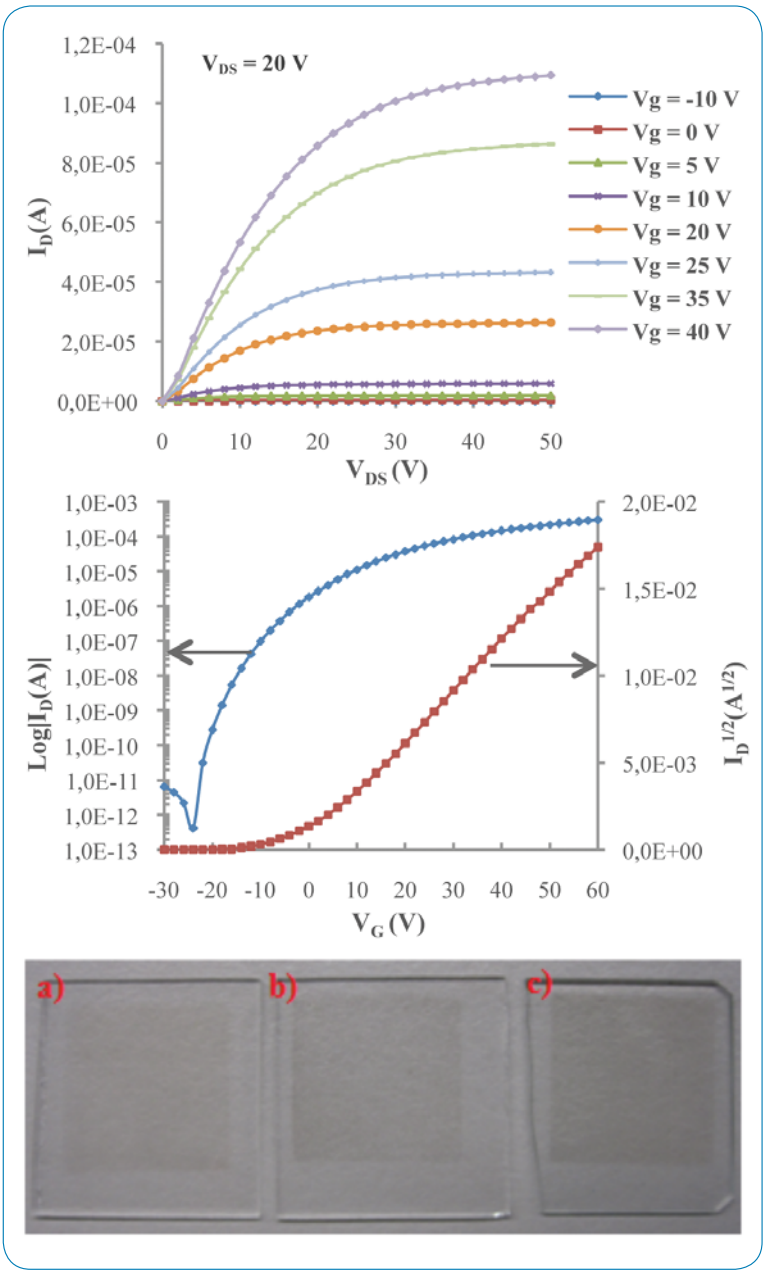


MicroRaman shift spectrum corresponding to a monolayer graphene deposited on Cu/c-Si. The colored map corresponds to the I_{2D}/I_G distribution ratio in a region of 10 µm².

The activity of the **Homogeneous Catalysis Group** is still focusing, with regard to issues related to nanoscience, on the search for new ligands capable of stabilizing systems with nanoparticles, mainly Palladium Platinum and Ruthenium, so that they can be studied as precursors of species showing a catalytic activity different from the activity observed in molecular systems. The design of ligands stabilizing the nanoparticles constitutes an important part of the work carried out by the group. In particular, it is important to prepare chiral ligands that can introduce some control on the enantioselectivity so that they can be applied in the process of asymmetric synthesis later on. The use of ionic liquids as solvents in catalytic processes allows us to study firsthand the changes that occur in the particles used.

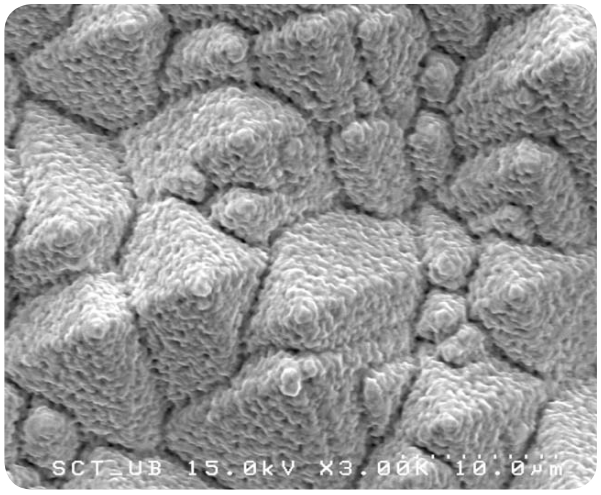
1.6. NANOENERGY: PRODUCTION, STORAGE AND ENVIRONMENT

The **Electronic Materials and Energy Group (M-2E)** has made progress in the manufacturing of transparent and flexible TFTs for inkjet, by using metal oxides as semiconductor electrodes. Several Indium-oxide-based compositions with various additives were tested, verifying polarity, quality and continuity of the layers, transparency, morphology, compatibility with previously developed materials and their electrical characteristics. The group is currently studying an optimal method to develop an entirely transparent and flexible electronics.



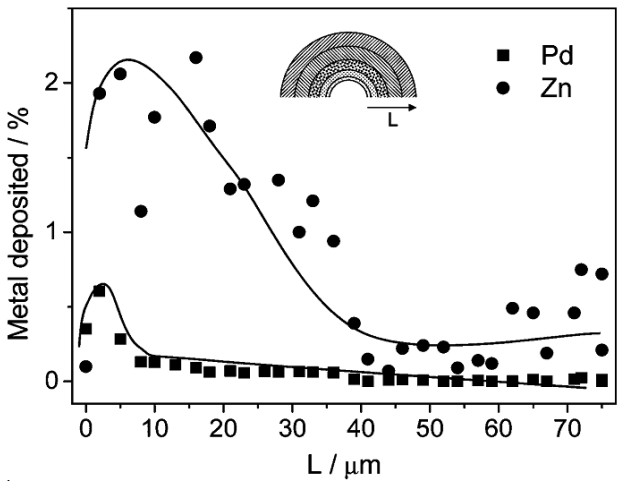
Characteristics I-V curves of thin transistors (TFTs) based on transparent metallic oxides and fabricated by means ok inkjet process.

Within the scope of nanoenergy, The **Solar Energy Group** has focused its research on the improvement of silicon-thin-film-based solar cells. In particular, all the relevant aspects in order to optimize light absorbtion by the devices have been considered, such as the development of transparent conductive oxides for front and back contacts, the introduction of nanometric layers as optical couplers between the front transparent conducting oxide and the amorphous silicon device, or the development of textures on the glass substrate to enhance light scattering.



Novel textures developed by the GES by combining micro -and nano-structures, aimed at improving sun light absorption within solar cells as a means of increasing conversion efficiency.

The **Catalytic Materials Group (MATCAT)** has been working on the development and design of new materials with catalytic properties for use in processes of reformation of bioalcohols which may be applied to an alternative production of hydrogen and to the chemical recycling of CO2, by means of their conversion into higher alcohols. The materials are fabricated following different methods, and their structural and physico-chemical characteristics are related to their catalytic behaviour in the aforementioned processes, among others.

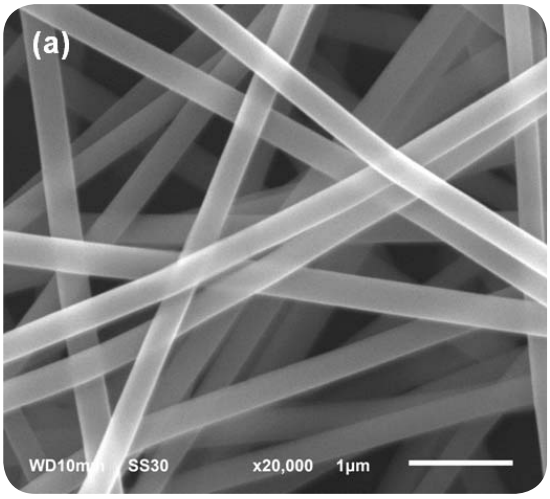


EPMA-EDX analysis, of a Pd-Zn-based catalytic membrane reactor.

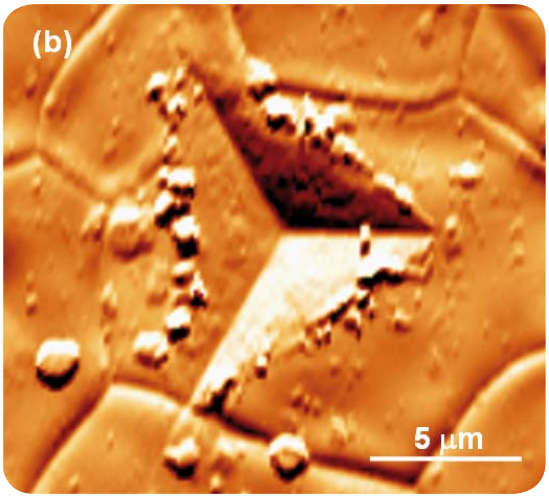
The activity of the **Centre of Design and Optimization of Materials (DIOPMA)** in the field of nanotechnology is related to the following research lines:

1. Synthesis of nanostructured materials by manufacturing components (electrodes and electrolytes) for Solid Oxide Fuel Cells (SOFCs), and superconductor materials using polyacrylamide gel combustion method. We also work on the synthesis of nanoparticles via conventional rutes, by reduction in aqueous media and surfactants, and on the characterization of these nanoparticles by TEM. In addition, we also develop the synthesis of Ni nanoparticles by magnetic separation, and nanofibers and crystallization of polymers using electrospinning technique.

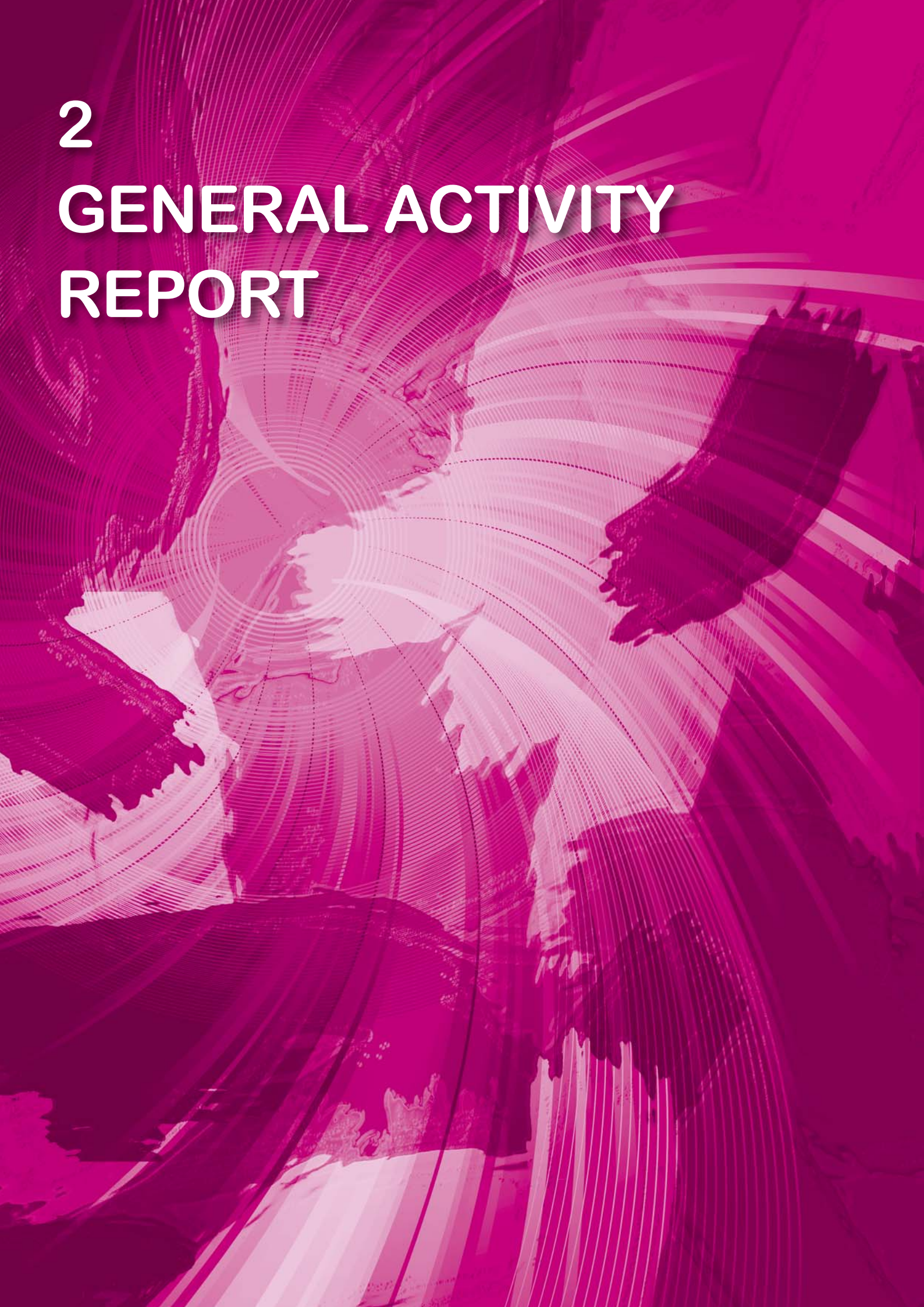
2. Nanomechanical characterization of different functional ceramics, using nanoindentation technique: electrolytes for SOFCs, such as YSZ (yttria stabilized zirconia), YSZ-PSZ (yttria and partial stabilized zirconia) composites, GDC (gadolinia doped ceria), and LSGM (perovskite base on lanthanum, strontium, gallium and magnesium), and superconductor materials (YBCO). Mechanical properties, such as Young modulus (E), hardness (H) and fracture toughness (KIC), and fracture mechanisms activated during indentation process are studied by nanoindentation technique and atomic force microcopy (AFM).



a) SEM image of a difluoroethylene nanofibers obtained by electrospinning technique.



b) AFM image of a nanohardness imprint at 500 nm indentation depth for GDC electrolyte sintered at 1400°C, in which grain boundaries reduce the field stress activated during the indentation process.



2 GENERAL ACTIVITY REPORT

During the 2011-2012 academic year, 10 new students have enrolled (first year). The total number of students enrolled in the programme at present is 54. The PhD program in Nanoscience began during the 2007-2008 academic year and from then until October 2012, a number of 18 doctoral theses have been read, and the theses read between November 1st 2011 and October 31st 2012 are the following:

- **Nanostructure Effects on the Magnetic Properties of Magnetite Nanoparticles: from Synthesis to Applications in Nanomedicine.**
  Author: Nicolás Pérez Rodríguez. Supervisor: Xavier Batlle Gelabert.

- **Customizing a Low Temperature System for Microwave Transmission Measurements. Quantum Transport in Thin TiN Films and Nanostructures.**
  Author: Carla Carbonell Cortés. Supervisor: Antoni García Santiago.

- **Studying Electrostatic Polarization Forces at the Nanoscales. Dielectric Constants of a Supported Biomembranes measured in air and Liquid Environment.**
  Author: Georg Gramse. Supervisor: Gabriel Gomila Lluch

- **Synthesis, Characterization and Application of $Ce_xZr_{1-x}O_2$ Nanostructured Materials.**
  Author: Sarah Abdolahzadeh-Ghom. Supervisor: Joan Ramon Morante i Lleonart.

- **Optical Grating Coupler Biosensor and Biomedical Applications.**
  Author: Lorena Diéguez Moure. Supervisors: Dr. Mauricio Moreno Sereno and Dr. Elena Martínez Fraiz.

- **Construction of Versatile Biomolecule Nanoplatforms via Dip-pen Nanolithography and their Application in Bio-Sensing and Cell Differentiation.**
  Author: Sabine Oberhansl. Supervisors: Dr. Elena Martínez Fraiz and Dr. Josep Samitier Martí.

- **Novel Magnetic Dynamic Phenomena at Low Temperatures: I – Topological Hysteresis and Quantum Tunneling in a Pb Type-I Superconductor II – Magnetic Deflagration in Gd_5Ge_4.**
  Author: Saúl Vélez Centoral. Supervisors: Dr. Javier Tejada Palacios and Dr. Antoni García Santiago.

For further details on the Programme, please visit the site:
http://www.ub.edu/in2ub/doctorat_nanociencia

During the academic year 2011-2012, the IN²UB has organized or given support to the seminars and conferences listed below:

- **Mid-nineteenth-century Technologies for Innovative Memories and Sensors, by Xavier Martí (Institute of Physics, Czech Academy of Sciences / Charles University in Prague).**
  April 27th, 2012

- **Lorenz Miroscopy, by César Magén (Instituto de Nanociencia de Aragón).**
  May 7th-11th, 2012

- **Dynamics of Nanoscaled Spin Systems, by Hamid Kachkachi (Promes, CNRS, University of Perpignan).**
  June, 25th-29th, 2012

- **Interface Science at the University of Colorado: Single-molecule Tracking, liquid Crystal Biodetection, and Monolayer-mediated Heterogenous Catalysis, by Daniel K. Schwartz (University of Boulder, Colorado).**
  July 5th, 2012

- **Rapid, Cheap, Label-free Detection of Cancer Markers Using NanowiresInterfaced to Viruses, by Reginald M. Penner (Department of Chemistry, and Department of Chemical Engineering and Materials Science, University of California, Irvine).**
  July 16th, 2012

- **Sniffing Molecules wih Metal Nanowires, by Reginald M. Penner (Department of Chemistry, and Department of Chemical Engineering and Materials Science, University of California, Irvine).**
  July 19th, 2012

- **Principles and Methods of Micro & Nanofabrication, by Antonis Olziersky (Institute of Microeletronics, National Center for Scientific Research "Demokritos", Athens).**
  September 25th-28th, 2012

- **Science and Technology of Modern Permanent Magnet Materials, by George C. Hadjipanayis (Department of Physics and Astronomy Sharp Lab, University of Delaware IEEE Magnetics society Distinguished lecturer 2012).**
  September 17th, 2012

- **Simulations in Nanoscience, by Sergey V. Buldyrev (Departament of Physics, Yeshiva University, New York City).**
  September, 14th-20th, 2012

Falling into the academic year 2012-2013, the IN²UB celebrated the fifth edition of its yearly meeting on November 15th 2012. The meeting was held at the premises of the University of Barcelona (Aula Enric Casassas), and was attended by both members of the IN²UB and young researchers working with the groups composing the institute. The conference attendees had the chance to see 25 posters presented by young researchers and to atttend ten lectures offered by a plenary speaker (Ilya Reviakine, CIC BiomaGUNE, San Sebastián) and members of both the IN²UB and the CCiTUB (Centres Científics i Tecnològics de la Universitat de Barcelona)

Since July 2009, the IN²UB is part of the scientific cluster SECPhO (Southern European Cluster of Photonics and Optics). The IN²UB collaborates with the costs and activities of the cluster through an annual fee. Likewise, the IN²UB organizes a yearly visit to the laboratories of photonics and optics groups of IN²UB linked to SECPHO and funds to its members attendance to specialized conferences when required. On the other hand, the SECPHO third yearly meeing is expected to takeplace by the end of november within the larger frame of the Spie Conference (see http://spie.org/x13206.xml)

After approval by the IUPAP in January 2010 of the city to host the XX edition of the ICM 2015, the IN²UB has continued working towards the organisation of this event. Currently, 80% of the bulk of the research carried out in magnetism is closely related to nanotechnologies, and the IN²UB members therefore believe that holding this conference in our city will be extremely positive for the scientific community

doing research in this field in our country. Last July, 2012, the organising committee of ICM 2015 travelled to Busan with occasion of the ICM 2012, in order to present to its organizers and attendants the 2015 ICM event to be held in Barcelona.

In addition, and connected to international conferences, the IN²UB has cofunded and supported the MOLMAT 2012 conference (see http://molmat2012.com/). The Fifth International Congress on Molecular Magnetism (MOLMAT2012) was celebrated in Barcelona on the past July 3d to 6th, at the facilities of the Auditori AXA. This congress is a multidisciplinary meeting point aimed at bringing together scientists from very diverse disciplines who share an interest on the wide topic of Molecular Materials. The July edition included sessions on Surface Science, Porous Materials, Magnetism, Optical Properties, Biomaterials, Theoretical Chemistry and Nanomaterials, and was the first to be celebrated out of France, as an initial step towards the full internationalization of the event. The meeting was chaired by a professor from the Department of Inorganic Chemistry of the Universitat de Barcelona (UB), Dr. Guillem Aromí, while the organizing committee was mainly composed by members of the same department (Dr. Núria Aliaga-Alcalde, Dr. Imma Angurell, Dr. Leoni A. Barrios, Dr. Albert Figuerola, Dr. Patrick Gámez, Dr. Arnald Grabulosa, Dr. Laura Rodríguez, Dr. José Sánchez Costa, Dr. E. Carolina Sañudo, Dr. Ramón Vicente) together with Dr. Jordi Ribas and Dr. Mercè Deumal (Department of Physical Chemistry, UB) and Dr. Olivier Roubeau (University of Zaragoza - CSIC). The Department of Inorganic Chemistry was also represented in the specialized scientific committee (Dr. Albert Escuer and Dr. Eliseo Ruiz). This fifth edition of MOLMAT was honored by the presence of 14 distinguished invited speakers from around the world, who contributed to a total of 61 oral presentations. The total number of participants was above 400 people, representing a total of 42 countries from the five continents.

APPENDIX 1

LIST OF PROJECTS FUNDED 2011-2012

MODELING AND SIMULATION OF SYSTEMS AND PROPERTIES OF MATTER IN THE NANOSCALE

Principal Investigator: MANUEL BARRANCO GOMEZ (Estructura i Constituents de la Matèria)
Title: **Física Nuclear Teòrica i de Moltes Partícules en Interacció.**
Reference: 2009SGR1289 **Institution:** UB

Principal Investigator: MANUEL BARRANCO GOMEZ (Estructura i Constituents de la Matèria)
Title: **Estructura y dinámica cuántica de sistemas atómicos y electrónicos**
Reference: FIS2008-00421/FIS **Institution:** UB

Principal Investigator: RICARDO MAYOL SANCHEZ (Estructura i Constituents de la Matèria)
Title: **Research topics in the structure and dynamics of atomic, nuclear and electronic systems**
Reference: FIS2011-28617-C02-01
Institution: UB

Principal Investigator: ANTONI PLANES VILA (Estructura i Constituents de la Matèria)
Title: **Materials: Transicions de Fase Estructurals i Magnètiques**
Reference: 2009SGR893 **Institution:** UB

Principal Investigator: EDUARD VIVES SANTA-EULALIA (Estructura i Constituents de la Matèria)
Title: **Relación entre propiedades ferroicas en materiales con características multifuncionales**
Reference: MAT2010-15114 **Institution:** UB

Principal Investigator: LLUIS MAÑOSA CARRERA (Estructura i Constituents de la Matèria)
Title: **Materiales Calóricos Gigantes para aprovechamiento de energía y refrigeración sostenible**
Reference: PRI-PIBIN-2011-0780 **Institution:** UB

Principal Investigator: JOSE MIGUEL RUBI CAPACETI (Física Fonamental)
Title: **Física Estadística**
Reference: 2009SGR634 **Institution:** UB

Principal Investigator: JOSE MIGUEL RUBI CAPACETI (Física Fonamental)
Title: **Modelización, cinética y conversión de energía en sistemas nanoscópicos**
Reference: FIS2008-04386/FIS **Institution:** UB

Principal Investigator: JOSE MIGUEL RUBI CAPACETI (Física Fonamental)
Title: **Formación, transporte y energética en sistemas multidisciplinares en la mesoescala**
Reference: FIS2011-22603 **Institution:** UB

Principal Investigator: IGNACIO PAGONABARRAGA MORA (Física Fonamental)
Title: **Pulsatile Viscus and Viscoelastic Microfluidics (Micropulsatile)**
Reference: PIEF-GA-2011-301214
Institution: UB

Principal Investigator: M. DEL CARMEN MIGUEL LOPEZ (Física Fonamental)
Title: **Robustez, adaptabilidad y fallos en materiales complejos y redes socio-tecnológicas**
Reference: FIS2010-21781-C02-02
Institution: UB

Principal Investigator: GIANCARLO FRANZESE (Física Fonamental)
Title: **Dinámica y Termodinámica del Agua Nano-Confinada e Interfacial**
Reference: FIS2009-10210 **Institution:** UB

Principal Investigator: GIANCARLO FRANZESE (Física Fonamental)
Title: **Modelling basis and kinetics of nanoparticle interaction with membranes, uptake into cells, and sub-cellular and inter-compartmental transport (NanoTransKinetics)**
EU Reference: NMP4-SL-2011-266737 **Institution:** UB

NANOBIOTECHNOLOGY

Principal Investigator: JORDI ORTIN RULL (Estructura i Constituents de la Matèria) **Title:** **Física no lineal** **Reference:** 2009SGR14 **Institution:** Universitat de Barcelona

Principal Investigator: JOSE MARIA SANCHO HERRERO (Estructura i Constituents de la Matèria) **Title:** **Dinámica no lineal y estocástica en sistemas físicos y biofísicos** **Reference:** FIS2009-13360-C03-01 **Institution:** Universitat de Barcelona

Principal Investigator: JAUME CASADEMUNT VIADER (Estructura i Constituents de la Matèria) **Title:** **Auto-organización en materiales blandos y materia viva: II) Fluidos complejos, Células y Tejidos** **Reference:** FIS2010-21924-C02-02 **Institution:** Universitat de Barcelona

Principal Investigator: AURORA HERNANDEZ MACHADO (Estructura i Constituents de la Matèria) **Title:** **Dinámica interfacial en fluidos y sistemas biofísicos: Teoría y experimentos** **Reference:** FIS2009-12964-C05-02 **Institution:** Universitat de Barcelona

Principal Investigator: FCO.I.JAVIER PASTOR BLASCO (Microbiologia) **Title:** **Grup de Biodegradació de Xenobiòtics i Productes Naturals: aspects bàsics i aplicacions a tecnologies netes** **Reference:** 2009SGR819 **Institution:** Universitat de Barcelona

Principal Investigator: FCO.I.JAVIER PASTOR BLASCO (Microbiologia) **Title:** **Enzimas para la valorización y mejora biotecnológica de las fibras de celulosa** **Reference:** CTQ2010-20238-C03-02 **Institution:** Universitat de Barcelona

Principal Investigator: M. PILAR DIAZ LUCEA (Microbiologia) **Title:** **Tecnologías enzimáticas pra la producción de biomateriales de nueva generación: Biocatálisis mediada por lipasas** **Reference:** CTQ2010-21183-C02-02 **Institution:** Universitat de Barcelona

Principal Investigator: RAMON FARRE VENTURA (Ciències Fisiològiques I) **Title:** **Efecto de los estímulos mecánicos en la diferenciación de células madre hacia el fenotipo epitelial alveolar** **Reference:** SAF2008-02991 **Institution:** Universitat de Barcelona

Principal Investigator: DANIEL NAVAJAS NAVARRO (Ciències Fisiològiques I) **Title:** **Alteración de la nanomecánica de los neutrófilos en la lesión pulmonar inducida por el ventilador** **Reference:** PI081908 **Institution:** Universitat de Barcelona

Principal Investigator: DANIEL NAVAJAS NAVARRO (Ciències Fisiològiques I) **Title:** **Señalización mecánica en la diferenciación de células madre en el pulmón. Modelo pulmón-en-un-chip** **Reference:** PI11/00089 **Institution:** IBEC

Principal Investigator: RAMON FARRE VENTURA (Ciències Fisiològiques I) **Title:** **Biongeniería del pulmón mediante cultivo de células madre en la matriz descelularizada del órgano: efecto de los estímulos biofísicos en la optimización del bioreactor** **Reference:** SAF2011-22576 **Institution:** Universitat de Barcelona

Principal Investigator: DANIEL NAVAJAS NAVARRO (Ciències Fisiològiques I)

Title: Mechanical pathways in cells: from molecular mechanisms to cell function (MecPath) **EU**
Reference: PCIG10-GA-2011-303848
Institution: Universitat de Barcelona

Principal Investigator: GUSTAVO EGEA GURI (Biologia Cel.lular i Anatomia Patològica)
Title: Tràfic intracel·lular i dinàmica del citoesquelet **Reference:** 2009SGR1070
Institution: Universitat de Barcelona

Principal Investigator: GUSTAVO EGEA GURI (Biologia Cel·lular,Immunologia i Neurociències)
Title: El citoesqueleto de actina y la homeostasis del diacilglicerol en la organización del aparato de Golgi **Reference:** BFU2009-07186
Institution: Universitat de Barcelona

Principal Investigator: GUSTAVO EGEA GURI (Biologia Cel·lular, Immunologia i Neurociències)
Title: Membrane trafficking of TGF-b receptors in Marfan cell lines: a new strategy to handle the TGF-b-induced signaling **Reference:** PJ009801
Institution: Universitat de Barcelona

Principal Investigator: FELIX RITORT FARRAN (Física Fonamental)
Title: Física de biomoléculas i sistemes petits (Small Biosystems Lab) **Reference:** 2009SGR271 **Institution:** Universitat de Barcelona

Principal Investigator: FELIX RITORT FARRAN (Física Fonamental)
Title: High-resolution tweezers for DNA replication and sequence identification (MagRepS) **EU Reference:** 267862
Institution: Universitat de Barcelona

Principal Investigator: FELIX RITORT FARRAN (Física Fonamental)
Title: Cinética de unzipping en móleculas individuales de ácidos nucleicos y la actividad enzimática de motores moleculares que se desplazan sobre ellos **Reference:** FIS2010-19342
Institution: Universitat de Barcelona

Principal Investigator: FRANCISCO VILADOMAT MEYA (Productes Naturals, Biologia Vegetal i Edafologia)
Title: Grup de Productes Naturals
Reference: 2009SGR1060 **Institution:** Universitat de Barcelona

Principal Investigator: ANTONIO FERNANDEZ TIBURCIO (Productes Naturals, Biologia Vegetal i Edafologia)
Title: Amino oxidasas y expresión génica
Reference: BIO2008-05493-C02-01
Institution: Universitat de Barcelona

Principal Investigator: ANTONIO FERNANDEZ TIBURCIO (Productes Naturals, Biologia Vegetal i Edafologia)
Title: Bases moleculares, bioquímicas y genéticas de la señalización mediante amino oxidasas en las respuestas a sequía, salinidad y temperaturas bajas **Reference:** BIO2011-29683
Institution: Universitat de Barcelona

Principal Investigator: M. ASUNCION ALSINA ESTELLER (Fisicoquímica)
Title: Pèptids i proteïnes: Estudis Fisicoquímics **Reference:** 2009SGR560
Institution: Universitat de Barcelona

Principal Investigator: FRANCESC RABANAL ANGLADA (Química Orgànica)
Title: Diseño, desarrollo sintético, estudio biofísico y evaluación biológica de lipopéptidos cíclicos como nuevos agentes antimicrobianos y anticancerígenos
Reference: CTQ2008-06200/BQU
Institution: Universitat de Barcelona

Principal Investigator: M. ASUNCION ALSINA ESTELLER (Fisicoquímica)
Title: Estudio del mecanismo de acción del GBV-C/HGV en sistemas lipídicos y su posible implicación en el proceso de inhibición del HIV
Reference: CTQ2009-13969-C02-02

Institution: Universitat de Barcelona

Principal Investigator: ISABEL HARO VILLAR
Title: **Diseño de nanosistemas peptídicos de liberación controlada para la administración ocular de fármacos**
Reference: CSIC-CITMA **Institution:** CSIC

Principal Investigator: M. ERMITAS ALCALDE PAIS (Farmacologia i Química Terapèutica)
Title: **Grup de Desenvolupament de Sistemes Policíclics Nitrogenats d'interés Biològic (DSPNIB)**
Reference: 2009SGR562 **Institution:** Universitat de Barcelona

Principal Investigator: M. LUISA PEREZ GARCIA (Farmacologia i Química Terapèutica)
Title: **Bio-functionalization of Micronanotools to study, tag and actuate inside living cells**
Reference: TEC2008-06883-C03-02
Institution: Universitat de Barcelona

Principal Investigator: M. LUISA PEREZ GARCIA (Farmacologia i Química Terapèutica)
Title: **Funcionalización de micronanoherramientas para ciencias de la vida** **Reference:** TEC2011-29140-C03-02
Institution: Universitat de Barcelona

Principal Investigator: M.IMMACULADA DINARES MILA (Farmacologia i Química Terapèutica)
Title: **Química de Sistemas Moleculares Basados en Sales de Imidazolio** **Reference:** CTQ2010-15251
Institution: Universitat de Barcelona

Principal Investigator: DAVID B. AMABILINO
Title: **Quiralitat en superfícies i màquines moleculars (CSIC)**
Reference: 2009SGR158 **Institution:** CSIC

Principal Investigator: M. LUISA PEREZ GARCIA (Farmacologia i Química Terapèutica)
Title: **Funcionalización de micronanoherramientas para ciencias de la vida** **Reference:**TEC2011-29140-C03-02 **Institution:** UB

Principal Investigator: JOSE LUIS MORENZA GIL (Física Aplicada i Òptica)
Title: **Capes Fines i Enginyeria de Superficies** **Reference:**2009SGR1538
Institution: Universitat de Barcelona

Principal Investigator: PEDRO SERRA COROMINA (Física Aplicada i Òptica)
Title: **Desarrollo de una nueva técnica de impresión directa con láser para la realización de micromotivos de biomoléculas** **Reference:**MAT2010-15905
Institution: Universitat de Barcelona

Principal Investigator: PEDRO SERRA COROMINA (Física Aplicada i Òptica)
Title: **Laser printing of organic/inorganic material for the fabrication of electronic devices (E-LIFT)** **EU Reference:** 247868
Institution: Universitat de Barcelona
Exploración de nuevas moléculas direccionadoras eficientes para la liberación de antimaláricos mediante nanovectores. MICINN BIO2011-25039.

Principal Investigator: JORDI BORRELL HERNANDEZ (Fisicoquímica)
Title: **Nanoestructura de Biomembranes (NANOBIOMEMB)**
Reference: 2009SGR1179 **Institution:** Universitat de Barcelona

Principal Investigator: Investigador principal: JORDI HERNANDEZ BORRELL (Fisicoquímica)
Title: **Investigación de la nanoestructura de la región periférica de un modelo de proteína integral de membrana**
Reference: CTQ2008-03922/BQU
Institution: Universitat de Barcelona

Principal Investigator: JOSEP SAMITIER MARTI (Electrònica)
Title: **Bioelectrònica i nanobioenginyeria:**

SIC-BIO Reference: 2009SGR505 **Institution:** IBEC - Institut de Bioenginyeria de Catalunya

Principal Investigator: JOSEP SAMITIER MARTI (Electrònica)
Title: Terapias regenerativas con células madre para el fallo cardiaco Reference: PLE2009/0147 **Institution:** IBEC - Institut de Bioenginyeria de Catalunya

Principal Investigator: JOSEP SAMITIER MARTI (Electrònica)
Title: LABINACHIP: Nuevos métodos para la fabricación de dispositivos microfluídicos Reference: IDC-20101178 **Institution:** IBEC - Institut de Bioenginyeria de Catalunya

Principal Investigator: JOSE M. LOPEZ VILLEGAS (Electrònica)
Title: Creixement 2011 del CEMIC-Dep. d'Electrònica-UB (centre tecnio) Reference: TECCIT11-1-0023 **Institution:** Universitat de Barcelona

Principal Investigator: JOSEP SAMITIER MARTI (Electrònica)
Title: Universal Diagnostic Platforms Based On Oligonucleotide Codified Nanoparticles and DNA Microarray Sensor Devices Reference: DPI2011-29216-C02-01 **Institution:** IBEC

Principal Investigator: JOSEP SAMITIER MARTI (Electrònica)
Title: Plataforma Nanomedicina_2011 Reference: INF-2011-0047-300000 **Institution:** IBEC

Principal Investigator: JOSEP SAMITIER MARTI (Electrònica)
Title: An integrated platform enabling Theranostic applications at the Point of Primary Care (TheraEDGE) EU Reference: 216027 **Institution:** Universitat de Barcelona

Principal Investigator: JOSEP SAMITIER MARTI (Electrònica) **Title: Array of Robots Augmenting the KiNematics of Endoluminal Surgery (ARAKNES) EU Reference:** 224565 **Institution:** Universitat de Barcelona

Principal Investigator: JOSEP SAMITIER MARTI (Electrònica) **Title: Bioelectronic Olfactory Neuron Device (BOND) EU Reference:** 228685 **Institution:** Universitat de Barcelona

NANOPHARMACOTHERAPY

Principal Investigator: MARIA JOSE GARCIA CELMA (Farmàcia i Tecnologia Farmacèutica)
Title: Tecnologías de autoagregación de moléculas anfifílicas para aplicaciones terapéuticas Reference: CTQ2011-29336-C03-03 **Institution:** Universitat de Barcelona

Principal Investigator: MARIA LUISA GARCIA LOPEZ (Fisicoquímica)
Title: Analysis of the stress mechanisms during sterilization and stabilisation by lyophilisation of nanostructured biomaterials and the effects on their biopharmaceutical profiles Reference: MAT2011-26994 **Institution:** Universitat de Barcelona

Principal Investigator: MARIA LUISA GARCIA LOPEZ (Fisicoquímica)
Title: Análisis del proceso de liofilización y esterilización de sistemas nanoestructurados y su efecto en el comportamiento biofarmacéutico y en el perfil toxicológico Reference: MAT2010-19877 **Institution:** Universitat de Barcelona

Principal Investigator: ELIANA SOUTO
Title: NanoLaseRelief: Integrating

nanotechnologies for pain relief in laser therapy of vascular lesions **Reference:** PTDC/SAU-FAR/113100/2009 **Institution:** External

Principal Investigator: ISABEL HARO VILLAR
Title: **Diseño de nanosistemas peptídicos de liberación controlada para la administración ocular de fármacos**
Reference: CSIC-CITMA **Institution:** External

Principal Investigator: MARIA JOSE GARCIA CELMA (Farmàcia i Tecnologia Farmacèutica)
Title: **Obtención y caracterización de estructuras meso/macroporosas a partir de emulsiones altamente concentradas: aplicación en Biomedicina como implantes y sistemas de liberación controlada de fármacos**
Reference: CTQ2008-06892-C03-02/ PPQ **Institution:** Universitat de Barcelona

Principal Investigator: ROSA MARIA LAMUELA RAVENTOS (Nutrició i Bromatologia)
Title: **Evaluación del efecto antihipertensivo y antiinflamatorio de los polifenoles, carotenos y vitamina C deltomate, según la ración dietética ingerida** **Reference:** AGL2010-22319-C03-01 **Institution:** Universitat de Barcelona

Principal Investigator: JOAN ESTELRICH LATRAS (Fisicoquímica)
Title: **Nanopartículas magnéticas blandas con aplicaciones biomédicas**
Reference: MAT2009-13155-C04-03
Institution: Universitat de Barcelona

NANOMAGNETISM, NANOELECTRONICS AND NANOPHOTONICS

Principal Investigator: RAMON VICENTE CASTILLO (Química Inorgànica)
Title: **Interaccions magnètiques i magnetisme molecular** **Reference:** 2009SGR1454 **Institution:** Universitat de Barcelona

Principal Investigator: ALBERTO ESCUER FITE (Química Inorgànica)
Title: **Magnetismo molecular:sistemas magnéticos ordenados (SCM, SMM) y modelos bioinorgànicos derivados de elementos de transición d y f** **Reference:** CTQ2009-07264
Institution: Universitat de Barcelona

Principal Investigator: GUILLEM AROMI BEDMAR (Química Inorgànica)
Title: **Diseño, Síntesis y Estudio Físico-Químico de Materiales Funcionales de Base Molecular** **Reference:** CTQ2009-06959 **Institution:** Universitat de Barcelona

Principal Investigator: GUILLEM AROMI BEDMAR (Química Inorgànica)
Title: **Design and Preparation of Functional Molecules for Quantum Computing and Information Processing (FuncMolQIP)** **EU Reference:** 258060
Institution: Universitat de Barcelona

Principal Investigator: MANUEL VARELA FERNANDEZ (Física Aplicada i Òptica)
Title: **Oxidos Multifuncionales para la Manipulación de Spin y Comunicaciones Agiles** **Reference:** MAT2008-06761-C03-03/ NAN **Institution:** Universitat de Barcelona

Principal Investigator: MANUEL VARELA FERNANDEZ (Física Aplicada i Òptica)
Title: **Materiales avanzados y nanotecnologías para dispositivos y sistemas eléctricos, eléctricos, electrónicos y magnetoelectrónicos innovadores** **Reference:** CSD2007-00041
Institution: Universitat de Barcelona

Principal Investigator: MANUEL VARELA FERNANDEZ (Física Aplicada i Òptica)
Title: **Oxidos y estructuras híbridas de respuesta multifuncional**
Reference: MAT2011-29269-C03-03
Institution: Universitat de Barcelona

Principal Investigator: JAVIER TEJADA PALACIOS (Física Fonamental)
Title: **Grup de Magnetisme**
Reference: 2009SGR1249 **Institution:** Universitat de Barcelona

Principal Investigator: JAVIER TEJADA PALACIOS (Física Fonamental)
Title: **Experimentos a bajas temperaturas con ondas acústicas superficiales, microondas y campos magnéticos giratorios, en sistemas magnéticos y superconductores** **Reference:** MAT2008-04535/MAT **Institution:** Universitat de Barcelona

Principal Investigator: JOAN MANEL HERNANDEZ FERRAS (Física Fonamental)
Title: **Fenómenos a escala nanométrica en materiales magnéticos y superconductores a bajas temperaturas, bajo la acción de microondas de alta frecuencia y campos magnéticos rotatorios** **Reference:** MAT2011-23698 **Institution:** Universitat de Barcelona

Principal Investigator: JAVIER TEJADA PALACIOS (Física Fonamental)
Title: **Spint torque oscillators with applications in non digital computing science and communications (SpinTorqOsc)** **EU Reference:** 253214
Institution: Universitat de Barcelona

Principal Investigator: Mª DOLORES VELASCO CASTRILLO (Química Orgànica)
Title: **Preparación y estudio de materiales orgánicos multifuncionales. Desarrollo de dispositivos optoelectrónicos y aplicaciones magnéticas** **Reference:** CTQ2009-13797
Institution: Universitat de Barcelona

Principal Investigator: ALBERT CORNET CALVERAS (Electrònica)
Title: **Micro-nanotecnologies i nanoscòpies per dispositius electrònics i fotònics (MIND)** **Reference:** 2009SGR35
Institution: Universitat de Barcelona

Principal Investigator: JUAN DANIEL PRADES GARCIA (Electrònica)
Title: **Sistemas de detección y cuantificación de biomarcadores de la Enfermedad de Alzheimer (KIT-ALZHEIMER)** **Reference:** IPT-2011-1055-900000 **Institution:** Universitat de Barcelona

Principal Investigator: ALBERT CIRERA HERNANDEZ (Electrònica)
Title: **Desarrollo de una tecnología de esterilización ambiental en continuo para la eliminación de toxinas químicas y biológicas en interiores de aviones y espacios cerrados** **Reference:** IPT-2012-1277-300000 **Institution:** Universitat de Barcelona

Principal Investigator: ALBERT CIRERA HERNANDEZ (Electrònica)
Title: **Materiales Híbridos y recubrimientos basados en nanopartículas (NANOMAT). Actividad 2** **Reference:** NANOMAT
Institution: Universitat de Barcelona

Principal Investigator: ALBERT CIRERA HERNANDEZ (Electrònica)
Title: **Nanosensores integrados sobre microtecnología cerámica monolítica** **Reference:** TRA2009-0078
Institution: Universitat de Barcelona

Principal Investigator: ALBERT CIRERA HERNANDEZ (Electrònica)

Title: **Investigación de estructuras textiles con capacidad sensórica y que actúen como sistemas activos (Actuadores). CENIT INFINITEX**
Reference: INFINITEX **Institution:** FBG

Principal Investigator: ALBERTO ROMANO RODRIGUEZ (Electrònica)
Title: **Sistema modular basado en micro- y nanotecnologías avanzadas para aplicaciones de seguridad y calidad ambiental**
Reference: TEC2010-21357-C05-
Institution: Universitat de Barcelona

Principal Investigator: BLAS GARRIDO FERNANDEZ (Electrònica)
Title: **Interconexión óptica modulable a GHz y Láser a microdisco basados en tecnología CMOS** **Reference:** TEC2009-08359 **Institution:** Universitat de Barcelona

Principal Investigator: BLAS GARRIDO FERNANDEZ (Electrònica)
Title: **Silicon Nanodots for Solar Cell Tandem (NASCENT)**
EU Reference: NMP4-SL-2010-245977
Institution: Universitat de Barcelona

Principal Investigator: BLAS GARRIDO FERNANDEZ (Electrònica)
Title: **PHotonics ELectronics functional Integration on CMOS (HELIOS)** **EU Reference:** 224312
Institution: Universitat de Barcelona

Principal Investigator: PAOLO PELLEGRINO (Electrònica)
Title: **NANOdevice fabrication using BLOCK -copolymer based technology** **Reference:** EUI2008-03806
Institution: Universitat de Barcelona

Principal Investigator: FRANCISCA PEIRO MARTINEZ (Electrònica)
Title: **IMAGINE...Ciencia de Materiales a Resolución Sub-Angstrom** **Reference:** CSD2009-00013
Institution: Universitat de Barcelona

Principal Investigator: FRANCISCA PEIRO MARTINEZ (Electrònica)
Title: **Soluciones en Microscopía Electrónica aplicada a Materiales Nanoestructurados** **Reference:** MAT2010-16407 **Institution:** Universitat de Barcelona

Principal Investigator: AMILCAR RAMON LABARTA RODRIGUEZ (Física Fonamental)
Title: **Grup de Nanomaterials Magnètics** **Reference:** 2009SGR876
Institution: Universitat de Barcelona

Principal Investigator: XAVIER BATLLE GELABERT (Física Fonamental)
Title: **Magnetismo y transporte de carga dependiente de espín en materiales nanoestructurados ordenados/desordenados metálicos/aislantes** **Reference:** MAT2009-08667
Institution: Universitat de Barcelona

NANOSTRUCTURED MATERIALS

Principal Investigator: CARLOS MARIA MULLER JEVENOIS (Química Física)
Title: **ELECTRODEP** **Reference:** 2009SGR949
Institution: Universitat de Barcelona

Principal Investigator: ELISA VALLES GIMENEZ (Química Física)
Title: **Métodos electroquímicos para la preparación de materiales base CoPt con propiedades magnéticas y mecánicas modulables** **Reference:** CTQ2010-20726
Institution: Universitat de Barcelona

Principal Investigator: JAIME RAMON GRANELL SANVICENTE (Química Inorgànica)
Title: **Grup de Química Organometal·lica** **Reference:** 2009SGR1164 **Institution:** Universitat de Barcelona

Principal Investigator: GUILLERMO MULLER JEVENOIS (Química Inorgànica)
Title: **Diseño de nuevos ligandos quirales P-dadores: química de la coordinación, nanopartículas metálicas y aplicaciones en procesos enantioselectivos** **Reference:** CTQ2010-15292 **Institution:** Universitat de Barcelona

Principal Investigator: ENRIC BERTRAN SERRA (Física Aplicada i Òptica)
Title: **Física i Enginyeria de Materials Amorfs i Nanoestructures (FEMAN)** **Reference:** 2009SGR185 **Institution:** Universitat de Barcelona

Principal Investigator: ENRIC BERTRAN SERRA (Física Aplicada i Òptica)
Title: **Sistemas Multifuncionales de Absorción de Contaminantes Emergentes Basados en Nanotubos de Carbono**
Reference: CTQ2009-14671-C02-01
Institution: Universitat de Barcelona

Principal Investigator: JOSE LUIS ANDUJAR BELLA (Física Aplicada i Òptica)
Title: **Crecimiento de capas ultradelgadas de grafeno sobre substrato metálico para aplicaciones biomédicas** **Reference:** MAT2010-20468
Institution: Universitat de Barcelona

Principal Investigator: JOSE MARIA GUTIERREZ GONZALEZ (Enginyeria Química)
Title: **Tecnologías de Autoagregación de Compuestos Anfifílicos para Aplicaciones en Alimentos Funcionales y Cosmética**
Reference: CTQ2011-29336-C03-02
Institution: Universitat de Barcelona

Principal Investigator: JOSE LUIS MORENZA GIL (Física Aplicada i Òptica)
Title: **Capes Fines i Enginyeria de Superficies** **Reference:** 2009SGR1538
Institution: UB - Universitat de Barcelona

Principal Investigator: JOAN ESTEVE PUJOL (Física Aplicada i Òptica)
Title: **Funcionalización superficial de materiales para aplicaciones de alto valor añadido (FUNCOAT)** **Reference:** CSD2008-00023 **Institution:** Universitat de Barcelona

Principal Investigator: ARTURO LOUSA RODRIGUEZ (Física Aplicada i Òptica)
Title: **Estrategias de funcionalización mediante tratamientos superficiales de aleaciones CoCrMo para la mejora del rendimiento de prótesis articulares Metal-sobre-Metal**
Reference: MAT2011-29698-C03-03
Institution: Universitat de Barcelona

Principal Investigator: FRANCESC SAGUES MESTRE (Química Física)
Title: **SOC&SAM (Self-Organized Complexity and Self-Assembling Materials)** **Reference:** 2009SGR1055
Institution: Universitat de Barcelona

Principal Investigator: FRANCESC SAGUES MESTRE (Química Física)

Title: **Auto-organización en materiales blandos y materia viva:I) Monocapas de surfactantes. Cristales Líquidos y Coloides**
Reference: FIS2010-21924-C02-01
Institution: Universitat de Barcelona

NANOENERGY: PRODUCTION, STORAGE AND ENVIRONMENT

Principal Investigator: MERCE SEGARRA RUBI (Ciència dels Materials i Enginyeria Metal·lúrgica)
Title: **Grup de disseny i optimització de processos i materials**
Reference: 2009SGR645 **Institution:** Universitat de Barcelona

Principal Investigator: MERCE SEGARRA RUBI (Ciència dels Materials i Enginyeria Metal·lúrgica)
Title: **Diseño y obtención de pilas de combustible de óxido sólido de temperatura intermedia. Nuevos componentes y configuraciones**
Reference: MAT2008-06785-C02-01/ MAT **Institution:** Universitat de Barcelona

Principal Investigator: MERCE SEGARRA RUBI (Ciència dels Materials i Enginyeria Metal·lúrgica)
Title: **Celdas reversibles de óxido sólido de temperatura intermedia**
Reference: MAT2011-23623
Institution: Universitat de Barcelona

Principal Investigator: MERCE SEGARRA RUBI (Ciència dels Materials i Enginyeria Metal·lúrgica)
Title: **Incentivació de la transferència tecnològica del centre DIOPMA (itt-diopma)** **Reference:** TECCIT11-1-0022
Institution: Universitat de Barcelona
Principal Investigator: JOAN RAMON MORANTE LLEONART (Electrònica)
Title: **Materials electrònics i energia (m-2e)** **Reference:** 2009SGR440
Institution: IREC - Institut de Recerca en Energia de Catalunya

Principal Investigator: JOAN RAMON MORANTE LLEONART (Electrònica)
Title: **REDES 2025** **Reference:** PSE-120000-2009-5 **Institution:** IREC - Institut de Recerca en Energia de Catalunya

Principal Investigator: JOAN RAMON MORANTE LLEONART (Electrònica)
Title: **Nuevas utilizaciones industriales sostenibles del CO_2** **Reference:** CEN-2008 - 1027 **Institution:** IREC- Institut de Recerca en Energia de Catalunya

Principal Investigator: JOAN RAMON MORANTE LLEONART (Electrònica)
Title: **Development of more efficient catalysts for the design of sustainable shemical processes and celan energy production** **Reference:** CSD2009-00050 **Institution:** IREC- Institut de Recerca en Energia de Catalunya

Principal Investigator: JOAN RAMON MORANTE LLEONART (Electrònica) **Title:** **Multifunctional materials in 3D nano architectures for energy conversion and storage** **Reference:** MAT2010-21510
Institution: IREC- Institut de Recerca en Energia de Catalunya

Principal Investigator: JOAN RAMON MORANTE LLEONART (Electrònica)
Title: **S3 EU** **Reference:** FP7-NMP-2009-47768
Institution: IREC- Institut de Recerca en Energia de Catalunya

Principal Investigator: JOAN BERTOMEU BALAGUERO (Física Aplicada i Òptica)
Title: **Grup d'Energia Solar** **Reference:** 2009SGR1532 **Institution:** Universitat de Barcelona

Principal Investigator: JOAN BERTOMEU BALAGUERO (Física Aplicada i Òptica)
Title: **Diseño e industrialización de módulos fotovoltaicos en Silicio de capa fina (Microsilo8)** **Reference:** PSS-120000-2008-2-3-4-5-6 **Institution:** Universitat de Barcelona

Principal Investigator: JOAN BERTOMEU BALAGUERO (Física Aplicada i Òptica)
Title: **Avances en Materiales e Interfaces para Células solares de silicio en lámina delgada** **Reference:** ENE2010-21384-C04-03
Institution: Universitat de Barcelona

Principal Investigator: JOAN BERTOMEU BALAGUERO (Física Aplicada i Òptica)
Title: **Inndisol - Innovación en dispositivos fotovoltaicos e integración arquitectónica solar** **Reference:** IPT-420000-2010-6
Institution: Universitat de Barcelona

Principal Investigator: JOAN BERTOMEU BALAGUERO (Física Aplicada i Òptica)
Title: **High Efficient Very Large Area Thin Film Silicon Photovoltaic Modules (HELATHIS)** **Reference:** 241378
Institution: Universitat de Barcelona

Principal Investigator: NARCISO HOMS MARTI (Química Inorgànica)
Title: **Materials Inorgànics Avançats i catàlisi** **Reference:** 2009SGR674
Institution: Universitat de Barcelona

Principal Investigator: NARCISO HOMS MARTI (Química Inorgànica)
Title: **Diseño de catalizadores multicomponentes para la producción de hidrógeno de alta pureza por reformado oxidante de bioalcoholes**
Reference: MAT2008-02561/MAT
Institution: Universitat de Barcelona

Principal Investigator: NARCISO HOMS MARTI (Química Inorgànica)
Title: **Soluciones a la Producción de Hidrógeno Energético y Reconversión asociada CENIT SPHERA** **Reference:** SPHERA **Institution:** Universitat de Barcelona

APPENDIX 2
LIST OF PUBLICATIONS

MODELING AND SIMULATION OF SYSTEMS AND PROPERTIES OF MATTER IN THE NANOSCALE

- **Title:** NUCLEATION AND CAVITATION IN PARAHYDROGEN
  Author(s): Pi, Marti; Barranco, Manuel; Navarro, Jesus; *et al.* **Source:** CHEMICAL PHYSICS **Volume:** 399 **Pages:** 213-217 **DOI:** 0.1016/j.chemphys.2011.04.033 **Published:** MAY 3 2012

- **Title:** MG IMPURITY IN HELIUM DROPLETS
  Author(s): Navarro, J.; Mateo, D.; Barranco, M.; *et al.* **Source:** JOURNAL OF CHEMICAL PHYSICS **Volume:** 136 **Issue:** 5 **Article Number:** 054301 **DOI:** 10.1063/1.3675919 **Published:** FEB 7 2012

- **Title:** DESORPTION OF ALKALI ATOMS FROM HE-4 NANODROPLETS
  Author(s): Hernando, Alberto; Barranco, Manuel; Pi, Marti; *et al.* **Source:** PHYSICAL CHEMISTRY CHEMICAL PHYSICS **Volume:** 14 **Issue:** 11 **Pages:** 3996-4010 **DOI:** 10.1039/c2cp23526a **Published:** 2012

- **Title:** CONFIGURATION INTERACTION APPROACH TO FERMI LIQUID-WIGNER CRYSTAL MIXED PHASES IN SEMICONDUCTOR NANODUMBBELLS
  Author(s): Ballester, A.; Movilla, J. L.; Escartin, J. M.; *et al.* **Source:** JOURNAL OF APPLIED PHYSICS **Volume:** 112 **Issue:** 2 **Article Number:** 024311 **DOI:** 10.1063/1.4737774 **Published:** JUL 15 2012

- **Title:** HELIUM MEDIATED DEPOSITION: MODELING THE HE-TIO2(110)-(1X1) INTERACTION POTENTIAL AND APPLICATION TO THE COLLISION OF A HELIUM DROPLET FROM DENSITY FUNCTIONAL CALCULATIONS
  Author(s): Aguirre, Nestor F.; Mateo, David; Mitrushchenkov, Alexander O.; *et al.* **Source:** JOURNAL OF CHEMICAL PHYSICS **Volume:** 136 **Issue:** 12 **Article Number:** 124703 **DOI:** 10.1063/1.3698173 **Published:** MAR 28 2012

- **Title:** RUNNING FASTER TOGETHER: HUGE SPEED UP OF THERMAL RATCHETS DUE TO HYDRODYNAMIC COUPLING
  Author(s): Malgaretti, Paolo; Pagonabarraga, Ignacio; Frenkel, Daan **Source:** PHYSICAL REVIEW LETTERS **Volume:** 109 **Issue:** 16 **Article Number:** 168101 **DOI:** 10.1103/PhysRevLett.109.168101 **Published:** OCT 17 2012

- **Title:** DENSITY-DEPENDENT DISPERSAL AND POPULATION AGGREGATION PATTERNS
  Author(s): Mendez, Vicenc; Campos, Daniel; Pagonabarraga, Ignacio; *et al.* **Source:** JOURNAL OF THEORETICAL BIOLOGY **Volume:** 309 **Pages:** 113-120 **DOI:** 10.1016/j.jtbi.2012.06.015 **Published:** SEP 21 2012

- **Title:** INSTRINSIC OSCILLATIONS OF POLYMERIZING ANTIPARALLEL MICROTUBULES IN A MOTOR BATH (VOL 98, 68005, 2012)
  Author(s): Muhuri, Sudipto; Pagonabarraga, Ignacio; Casademunt, Jaume **Source:** EPL **Volume:** 99 **Issue:** 1 **Article Number:** 19901 **DOI:** 10.1209/0295-5075/99/19901 **Published:** JUL 2012

- **Title: INSTRINSIC OSCILLATIONS OF POLYMERIZING ANTIPARALLEL MICROTUBULES IN A MOTOR BATH**
  Author(s): Muhuri, Sudipto; Pagonabarraga, Ignacio; Casademunt, Jaume **Source:** EPL **Volume:** 98 **Issue:** 6 **Article Number:** 68005 **DOI:** 10.1209/0295-5075/98/68005 **Published:** JUN 2012

- **Title: WETTING DYNAMICS: ADSORBED COLLOIDS RELAX SLOWLY**
  Author(s): Pagonabarraga, Ignacio **Source:** NATURE MATERIALS **Volume:** 11 **Issue:** 2 **Pages:** 99-100 **DOI:** 10.1038/nmat3235 **Published:** FEB 2012

- **Title: COOPERATIVE RECTIFICATION IN CONFINED BROWNIAN RATCHETS**
  Author(s): Malgaretti, Paolo; Pagonabarraga, Ignacio; Miguel Rubi, J. **Source:** PHYSICAL REVIEW E **Volume:** 85 **Issue:** 1 **Article Number:** 010105 **DOI:** 10.1103/PhysRevE.85.010105 **Part:** Part 1 **Published:** JAN 20 2012

- **Title: AFM MEASUREMENTS AND LIPID REARRANGEMENTS: EVIDENCE FROM RED BLOOD CELL SHAPE CHANGES**
  Author(s): Melzak, Kathryn A.; Lazaro, Guillermo R.; Hernandez-Machado, Aurora; *et al.* **Source:** SOFT MATTER **Volume:** 8 **Issue:** 29 **Pages:** 7716-7726 **DOI:** 10.1039/c2sm25530h **Published:** 2012

- **Title: STRESS DISTRIBUTION OF FACETED PARTICLES IN A SILO AFTER ITS PARTIAL DISCHARGE**
  Author(s): Kanzaki, T.; Acevedo, M.; Zuriguel, I.; *et al.* **Source:** EUROPEAN PHYSICAL JOURNAL E **Volume:** 34 **Issue:** 12 **Article Number:** 133 **DOI:** 10.1140/epje/i2011-11133-5 **Published:** DEC 2011

- **Title: PHASE SEGREGATION AND TRANSPORT IN A TWO-SPECIES MULTI-LANE SYSTEM**
  Author(s): Muhuri, Sudipto; Pagonabarraga, Ignacio **Source:** JOURNAL OF STATISTICAL MECHANICS-THEORY AND EXPERIMENT **Article Number:** P11011 **DOI:** 10.1088/1742-5468/2011/11/P11011 **Published:** NOV 2011

- **Title: BIOPHYSICS OF ACTIVE VESICLE TRANSPORT, AN INTERMEDIATE STEP THAT COUPLES EXCITATION AND EXOCYTOSIS OF SEROTONIN IN THE NEURONAL SOMA**
  Author(s): De-Miguel, Francisco F.; Santamaria-Holek, Ivan; Noguez, Paula; *et al.* **Source:** PLOS ONE **Volume:** 7 **Issue:** 10 **Article Number:** e45454 **DOI:** 10.1371/journal.pone.0045454 **Published:** OCT 3 2012

- **Title: ON THE THERMODYNAMIC EFFICIENCY OF CA2+-ATPase MOLECULAR MACHINES**
  Author(s): Lervik, Anders; Bresme, Fernando; Kjelstrup, Signe; *et al.* **Source:** BIOPHYSICAL JOURNAL **Volume:** 103 **Issue:** 6 **Pages:** 1218-1226 **DOI:** 10.1016/j.bpj.2012.07.057 **Published:** SEP 19 2012

- **Title: A NON-EQUILIBRIUM THERMODYNAMICS MODEL FOR COMBINED ADSORPTION AND DIFFUSION PROCESSES IN MICRO- AND NANOPORES**
  Author(s): Santamaria-Holek, Ivan; Grzywna, Zbigniew J.; Miguel Rubi, J. **Source:** JOURNAL OF NON-EQUILIBRIUM THERMODYNAMICS **Volume:** 37 **Issue:** 3 **Pages:** 273-290 **DOI:** 10.1515/

jnetdy-2011-0029 **Published:** SEP 2012

- **Title: DIPOLAR TRANSFORMATIONS OF TWO-DIMENSIONAL QUANTUM DOTS ARRAYS PROVEN BY ELECTRON ENERGY LOSS SPECTROSCOPY**
  Author(s): Moctezuma, R. E.; Nossa, J. F.; Camacho, A.; *et al.* **Source:** JOURNAL OF APPLIED PHYSICS **Volume:** 112 **Issue:** 2 **Article Number:** 024105 **DOI:** 10.1063/1.4737791 **Published:** JUL 15 2012

- **Title: THERMOMOLECULAR ORIENTATION OF NONPOLAR FLUIDS**
  Author(s): Roemer, Frank; Bresme, Fernando; Muscatello, Jordan; *et al.* **Source:** PHYSICAL REVIEW LETTERS **Volume:** 108 **Issue:** 10 **Article Number:** 105901 **DOI:** 10.1103/PhysRevLett.108.105901 **Published:** MAR 7 2012

- **Title: FAR-FROM-EQUILIBRIUM PROCESSES WITHOUT NET THERMAL EXCHANGE VIA ENERGY SORTING**
  Author(s): Vilar, Jose M. G.; Rubi, J. Miguel **Source:** JOURNAL OF CHEMICAL PHYSICS **Volume:** 136 **Issue:** 6 **Article Number:** 064115 **DOI:** 10.1063/1.3683441 **Published:** FEB 14 2012

- **Title: ENTROPIC SPLITTER FOR PARTICLE SEPARATION**
  Author(s): Reguera, D.; Luque, A.; Burada, P. S.; *et al.* **Source:** PHYSICAL REVIEW LETTERS **Volume:** 108 **Issue:** 2 **Article Number:** 020604 **DOI:** 10.1103/PhysRevLett.108.020604 **Published:** JAN 13 2012

- **Title: DIRECT MEASUREMENT OF PHAGE phi29 STIFFNESS PROVIDES EVIDENCE OF INTERNAL PRESSURE**
  Author(s): Hernando-Perez, Mercedes; Miranda, Roberto; Aznar, Maria; *et al.* **Source:** SMALL **Volume:** 8 **Issue:** 15 **Pages:** 2366-2370 **DOI:** 10.1002/smll.201200664 **Published:** AUG 6 2012

- **Title: RELEVANCE OF CAPSID STRUCTURE IN THE BUCKLING AND MATURATION OF SPHERICAL VIRUSES**
  Author(s): Aznar, Maria; Luque, Antoni; Reguera, David **Source:** PHYSICAL BIOLOGY **Volume:** 9 **Issue:** 3 **Article Number:** 036003 **DOI:** 10.1088/1478-3975/9/3/036003 **Published:** JUN 2012

- **Title: PHYSICS OF SHELL ASSEMBLY: LINE TENSION, HOLE IMPLOSION, AND CLOSURE CATASTROPHE**
  Author(s): Luque, Antoni; Reguera, David; Morozov, Alexander; *et al.* **Source:** JOURNAL OF CHEMICAL PHYSICS **Volume:** 136 **Issue:** 18 **Article Number:** 184507 **DOI:** 10.1063/1.4712304 **Published:** MAY 14 2012

- **Title: HYSTERESIS EFFECTS IN THE INVERSE MAGNETOCALORIC EFFECT IN MARTENSITIC Ni-Mn-In AND Ni-Mn-Sn**
  Author(s): Titov, I.; Acet, M.; Farle, M.; *et al.* **Source:** JOURNAL OF APPLIED PHYSICS**Volume:** 112 **Issue:** 7 **Article Number:** 073914 **DOI:** 10.1063/1.4757425 **Published:** OCT 1 2012

- **Title: BAROCALORIC EFFECT IN THE MAGNETOCALORIC PROTOTYPE Gd5Si2Ge2**
  Author(s): Yuce, Suheyla; Barrio, Maria; Emre, Bans; *et al.* **Source:** APPLIED PHYSICS LETTERS

Volume: 101 **Issue:** 7 **Article Number:** 071906 **DOI:** 10.1063/1.4745920 **Published:** AUG 13 2012

- **Title: THERMODYNAMICS OF FERROTOROIDIC MATERIALS: TOROIDOCALORIC EFFECT**
  Author(s): Castan, Teresa; Planes, Antoni; Saxena, Avadh **Source:** PHYSICAL REVIEW B **Volume:** 85 **Issue:** 14 **Article Number:** 144429 **DOI:** 10.1103/PhysRevB.85.144429 **Published:** APR 27 2012

- **Title: INVERSE BAROCALORIC EFFECT IN THE GIANT MAGNETOCALORIC La-Fe-Si-Co COMPOUND**
  Author(s): Manosa, Lluis; Gonzalez-Alonso, David; Planes, Antoni; *et al.*
  Source: NATURE COMMUNICATIONS **Volume:** 2 **Article Number:** 595 **DOI:** 10.1038/ncomms 1606 **Published:** DEC 2011

- **Title: CONFINEMENT OF ANOMALOUS LIQUIDS IN NANOPOROUS MATRICES**
  Author(s): Strekalova, Elena G.; Luo, Jiayuan; Stanley, H. Eugene; *et al.* **Source:** PHYSICAL REVIEW LETTERS **Volume:** 109 **Issue:** 10 **Article Number:** 105701 **DOI:** 10.1103/ PhysRevLett.109.105701 **Published:** SEP 4 2012

- **Title: HOMOGENEOUS CRYSTAL NUCLEATION NEAR A METASTABLE FLUID-FLUID PHASE TRANSITION**
  Author(s): Xu, Limei; Buldyrev, Sergey V.; Stanley, H. Eugene; *et al.* **Source:** PHYSICAL REVIEW LETTERS **Volume:** 109 **Issue:** 9 **Article Number:** 095702 **DOI:** 10.1103/PhysRevLett. 109.095702 **Published:** AUG 27 2012

- **Title: NANOSCALE DYNAMICS OF PHASE FLIPPING IN WATER NEAR ITS HYPOTHESIZED LIQUID-LIQUID CRITICAL POINT**
  Author(s): Kesselring, T. A.; Franzese, G.; Buldyrev, S. V.; *et al.* **Source:** SCIENTIFIC REPORTS **Volume:** 2 **Article Number:** 474 **DOI:** 10.1038/srep00474 **Published:** JUN 29 2012

- **Title: HYDROPHOBIC NANOCONFINEMENT SUPPRESSES FLUCTUATIONS IN SUPERCOOLED WATER**
  Author(s): Strekalova, E. G.; Mazza, M. G.; Stanley, H. E.; *et al.* **Source:** JOURNAL OF PHYSICS-CONDENSED MATTER **Volume:** 24 **Issue:** 6 **Article Number:** 064111 **DOI:** 10.1088/0953-8984/24/6/064111 **Published:** FEB 15 2012

- **Title: RELATIONS BETWEEN THE DIFFUSION ANOMALY AND COOPERATIVE REARRANGING REGIONS IN A HYDROPHOBICALLY NANOCONFINED WATER MONOLAYER**
  Author(s): de los Santos, Francisco; Franzese, Giancarlo **Source:** PHYSICAL REVIEW E **Volume:** 85 **Issue:** 1 **Article Number:** 010602 **DOI:** 10.1103/PhysRevE.85.010602 **Part:** Part 1 **Published:** JAN 27 2012

- **Title: UNDERSTANDING THE ROLE OF HYDROGEN BONDS IN WATER DYNAMICS AND PROTEIN STABILITY**
  Author(s): Bianco, Valentino; Iskrov, Svilen; Franzese, Giancarlo **Source:** JOURNAL OF BIOLOGICAL PHYSICS **Volume:** 38 **Issue:** 1 **Special Issue:** SI **Pages:** 27-48 **DOI:** 10.1007/ s10867-011-9235-7 **Published:** JAN 2012

Title: **EFFECT OF HYDROPHOBIC ENVIRONMENTS ON THE HYPOTHESIZED LIQUID-LIQUID CRITICAL POINT OF WATER** **Author(s):** Strekalova, Elena G.; Corradini, Dario; Mazza, Marco G.; *et al.* **Source:** JOURNAL OF BIOLOGICAL PHYSICS **Volume:** 38 **Issue:** 1 **Special Issue:** SI **Pages:** 97-111 **DOI:** 10.1007/s10867-011-9241-9 **Published:** JAN 2012

Title: **MORE THAN ONE DYNAMIC CROSSOVER IN PROTEIN HYDRATION WATER** **Author(s):** Mazza, Marco G.; Stokely, Kevin; Pagnotta, Sara E.; *et al.* **Source:** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA **Volume:** 108 **Issue:** 50 **Pages:** 19873-19878 **DOI:** 10.1073/pnas.1104299108 **Published:** DEC 13 2011

Title: **UNDERSTANDING DIFFUSION AND DENSITY ANOMALY IN A COARSE-GRAINED MODEL FOR WATER CONFINED BETWEEN HYDROPHOBIC WALLS** **Author(s):** de los Santos, Francisco; Franzese, Giancarlo **Source:** JOURNAL OF PHYSICAL CHEMISTRY B **Volume:** 115 **Issue:** 48 **Pages:** 14311-14320 **DOI:** 10.1021/jp206197t **Published:** DEC 8 2011

NANOBIOTECHNOLOGY

- **Title:** **PHYSICS OF MOLECULAR MACHINES OPERATED BY A PARTICLE FLUX** **Author(s):** Perez-Carrasco, R.; Sancho, J. M. **Source:** EPL **Volume:** 100 **Issue:** 4 **Article Number:** 40001 **DOI:** 10.1209/0295-5075/100/40001 **Published:** NOV 2012

- **Title:** **WEAK DISORDER IN PERIODIC POTENTIALS: ANOMALOUS TRANSPORT AND DIFFUSION** **Author(s):** Lindenberg, Katja; Sancho, J. M.; Khoury, M.; *et al.* **Source:** FLUCTUATION AND NOISE LETTERS **Volume:** 11 **Issue:** 1 **Special Issue:** SI **Article Number:** 1240004 **DOI:** 10.1142/S0219477512400044 **Published:** MAR 2012

- **Title:** **POWER AND EFFICIENCY OF F1-ATPASE MOLECULAR MOTOR** **Author(s):** Sancho, J. M.; Perez-Carrasco, Ruben **Source:** FLUCTUATION AND NOISE LETTERS **Volume:** 11 **Issue:** 1 Special **Issue:** SI **Article Number:** 1240003 **DOI:** 10.1142/S0219477512400032 **Published:** MAR 2012

- **Title:** **ASYMMETRIC STOCHASTIC SWITCHING DRIVEN BY INTRINSIC MOLECULAR NOISE** **Author(s):** Frigola, David; Casanellas, Laura; Sancho, Jose M.; *et al.* **Source:** PLOS ONE **Volume:** 7 **Issue:** 2 **Article Number:** e31407 **DOI:** 10.1371/journal.pone.0031407 **Published:** FEB 21 2012

- **Title:** **BROWNIAN COLLOIDAL PARTICLES: ITO, STRATONOVICH, OR A DIFFERENT STOCHASTIC INTERPRETATION** **Author(s):** Sancho, J. M. **Source:** PHYSICAL REVIEW E **Volume:** 84 **Issue:** 6 **Article Number:** 062102 **DOI:** 10.1103/PhysRevE.84.062102 **Part:** Part 1 **Published:** DEC 12 2011

- **Title:** **CAPILLARY RISE IN HE LE-SHAW MODELS OF DISORDERED MEDIA**

Author(s): Clotet, Xavier; Planet, Ramon; Ortin, Jordi **Source:** JOURNAL OF COLLOID AND INTERFACE SCIENCE **Volume:** 377 **Pages:** 387-395 **DOI:** 10.1016/j.jcis.2011.12.080 **Published:** JUL 1 2012

- **Title: EXPERIMENTS ON THE LAMINAR OSCILLATORY FLOW OF WORMLIKE MICELLAR SOLUTIONS**
  Author(s): Casanellas, Laura; Ortin, Jordi **Source:** RHEOLOGICA ACTA **Volume:** 51 **Issue:** 6 **Pages:** 545-557 **DOI:** 10.1007/s00397-012-0620-3 **Published:** JUN 2012

- **Title: LAMINAR OSCILLATORY FLOW OF MAXWELL AND OLDROYD-B FLUIDS: THEORETICAL ANALYSIS**
  Author(s): Casanellas, L.; Ortin, J. **Source:** JOURNAL OF NON-NEWTONIAN FLUID MECHANICS **Volume:** 166 **Issue:** 23-24 **Pages:** 1315-1326 **DOI:** 10.1016/j.jnnfm.2011.08.010 **Published:** DEC 2011

- **Title: IMPACT OF STOCHASTIC ACCELERATIONS ON DOPANT SEGREGATION IN MICROGRAVITY SEMICONDUCTOR CRYSTAL GROWTH**
  Author(s): Ruiz, X.; Bitlloch, P.; Ramirez-Piscina, L.; *et al.* **Source:** JOURNAL OF CRYSTAL GROWTH **Volume:** 355 **Issue:** 1 **Pages:** 88-100 **DOI:** 10.1016/j.jcrysgro.2012.06.027 **Published:** SEP 15 2012

- **Title: GEMINI IMIDAZOLIUM AMPHIPHILES FOR THE SYNTHESIS, STABILIZATION, AND DRUG DELIVERY FROM GOLD NANOPARTICLES**
  Author(s): Casal-Dujat, Lucia; Rodrigues, Mafalda; Yaguee, Alex; *et al.* **Source:** LANGMUIR **Volume:** 28 **Issue:** 5 **Pages:** 2368-2381 **DOI:** 10.1021/la203601n **Published:** FEB 7 2012

- **Title: MACROCYCLIC IONIC LIQUID CRYSTALS**
  Author(s): Casal-Dujat, Lucia; Penon, Oriol; Rodriguez-Abreu, Carlos; *et al.* **Source:** NEW JOURNAL OF CHEMISTRY **Volume:** 36 **Issue:** 3 **Pages:** 558-561 **DOI:** 10.1039/c2nj20934a **Published:** 2012

- **Title: A SIMPLE HALIDE-TO-ANION EXCHANGE METHOD FOR HETEROAROMATIC SALTS AND IONIC LIQUIDS**
  Author(s): Alcalde, Ermitas; Dinares, Immaculada; Ibanez, Anna; *et al.* **Source:** MOLECULES **Volume:** 17 **Issue:** 4 **Pages:** 4007-4027 **DOI:** 10.3390/molecules17044007 **Published:** APR 2012

- **Title: A HALIDE-FOR-ANION SWAP USING AN ANION-EXCHANGE RESIN (A(-) FORM) METHOD: REVISITING IMIDAZOLIUM-BASED ANION RECEPTORS AND SENSORS**
  Author(s): Alcalde, Ermitas; Mesquida, Neus; Ibanez, Anna; *et al.* **Source:** EUROPEAN JOURNAL OF ORGANIC CHEMISTRY **Issue:** 2 **Pages:** 298-304 **DOI:** 10.1002/ejoc.201101355 **Published:** JAN 2012

- **Title: MODULAR GLUCURONOXYLAN-SPECIFIC XYLANASE WITH A FAMILY CBM35 CARBOHYDRATE-BINDING MODULE**
  Author(s): Valenzuela, Susana Valeria; Diaz, Pilar; Pastor, F. I. Javier
  Source: APPLIED AND ENVIRONMENTAL MICROBIOLOGY**Volume:** 78 **Issue:** 11 **Pages:** 3923-3931 **DOI:** 10.1128/AEM.07932-11 **Published:** JUN 2012

- **Title: EXPRESSION OF NOVEL BETA-GLUCANASE Cel12A FROM STACHYBOTRYS ATRA IN BACTERIAL AND FUNGAL HOSTS**
  Author(s): Picart, Pere; Goedegebuur, Frits; Diaz, Pilar; *et al.* **Source:** FUNGAL BIOLOGY **Volume:** 116 **Issue:** 3 **Pages:** 443-451 **DOI:** 10.1016/j.funbio.2012.01.004 **Published:** MAR 2012

- **Title: RHODOCOCCUS sp STRAIN CR-53 LIpR, THE FIRST MEMBER OF A NEW BACTERIAL LIPASE FAMILY (FAMILY X) DISPLAYING AN UNUSUAL Y-TYPE OXYANION HOLE, SIMILAR TO THE CANDIDA ANTARCTICA LIPASE CLAN**
  Author(s): Bassegoda, Arnau; Javier Pastor, F. I.; Diaz, Pilar **Source:** APPLIED AND ENVIRONMENTAL MICROBIOLOGY **Volume:** 78 **Issue:** 6 **Pages:** 1724-1732 **DOI:** 10.1128/AEM.06332-11 **Published:** MAR 2012

- **Title: ENZYMATIC GRAFTING OF NATURAL PHENOLS TO FLAX FIBRES: DEVELOPMENT OF ANTIMICROBIAL PROPERTIES**
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  Author(s): Mormeneo, Maria; Javier Pastor, F. I.; Zueco, Jesus **Source:** JOURNAL OF INDUSTRIAL MICROBIOLOGY & BIOTECHNOLOGY **Volume:** 39 **Issue:** 1 **Pages:** 115-123 **DOI:** 10.1007/s10295-011-1006-8 **Published:** JAN 2012

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  Author(s): Fernandez-Busquets, X.; Urban, P.; Valle-Delgado, J. J.; *et al.* **Conference:** 22nd IUBMB Congress/37th FEBS Congress **Location:** Seville, SPAIN **Date:** SEP 04-09, 2012 **Sponsor(s):** IUBMB; FEBS **Source:** FEBS JOURNAL **Volume:** 279 Special **Issue:** SI **Supplement:** 1 **Pages:** 329-329 **Published:** SEP 2012

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  Author(s): Duocastella, M.; Patrascioiu, A.; Fernandez-Pradas, J. M.; *et al.* **Source:** APPLIED PHYSICS A-MATERIALS SCIENCE & PROCESSING **Volume:** 109 **Issue:** 1 **Pages:** 5-14 **DOI:** 10.1007/s00339-012-7047-7 **Published:** OCT 2012

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  Author(s): Fernandez-Pradas, J. M.; Naranjo-Leon, S.; Morenza, J. L.; *et al.* **Source:** APPLIED SURFACE SCIENCE **Volume:** 258 **Issue:** 23 **Pages:** 9256-9259 **DOI:** 10.1016/j.apsusc.2011.09.106 **Published:** SEP 15 2012

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  Author(s): Patrascioiu, A.; Fernandez-Pradas, J. M.; Morenza, J. L.; *et al.* **Source:** APPLIED SURFACE SCIENCE **Volume:** 258 **Issue:** 23 **Pages:** 9412-9416 **DOI:** 10.1016/j.apsusc.2011.09.107 **Published:** SEP 15 2012

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NANOPHARMACOTHERAPY

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  Author(s): Morral-Ruiz, Genoveva; Solans, Conxita; Luisa Garcia, Maria; *et al.* **Source:** LANGMUIR **Volume:** 28 **Issue:** 15 **Pages:** 6256-6264 **DOI:** 10.1021/la204659y **Published:** APR 17 2012

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  Author(s): Vega, Estefania; Antonia Egea, M.; Cristina Calpena, Ana; *et al.* **Source:** INTERNATIONAL JOURNAL OF NANOMEDICINE **Volume:** 7 **Pages:** 1357-1371 **DOI:** 10.2147/IJN.S28481 **Published:** 2012

- **Title: RELEASE PROFILE AND TRANSSCLERAL PERMEATION OF TRIAMCINOLONE ACETONIDE LOADED NANOSTRUCTURED LIPID CARRIERS (TA-NLC): IN VITRO AND EX VIVO STUDIES**
  Author(s): Araujo, Joana; Garcia, Maria L.; Mallandrich, Mireia; *et al.* **Source:** NANOMEDICINE-NANOTECHNOLOGY BIOLOGY AND MEDICINE **Volume:** 8 **Issue:** 6 **Pages:** 1034-1041 **DOI:** 10.1016/j.nano.2011.10.015 **Published:** AUG 2012

- **Title: EXTERNAL MAGNETIC FIELD-INDUCED SELECTIVE BIODISTRIBUTION OF MAGNETOLIPOSOMES IN MICE**
  Author(s): Garcia-Jimeno, Sonia; Escribano, Elvira; Queralt, Josep; *et al.* **Source:** NANOSCALE RESEARCH LETTERS **Volume:** 7 **Article Number:** 452 **DOI:** 10.1186/1556-276X-7-452 **Published:** AUG 10 2012

- **Title: EXTERNAL MAGNETIC FIELD-INDUCED SELECTIVE BIODISTRIBUTION OF MAGNETOLIPOSOMES IN MICE**
  Author(s): Garcia-Jimeno, Sonia; Escribano, Elvira; Queralt, Josep; *et al.* **Source:** NANOSCALE RESEARCH LETTERS **Volume:** 7 **Article Number:** 452 **DOI:** 10.1186/1556-276X-7-452 **Published:** AUG 10 2012

- **Title: EFFECT OF THE SURFACE CHARGE OF ARTIFICIAL MODEL MEMBRANES ON THE AGGREGATION OF AMYLOID BETA-PEPTIDE**
  Author(s): Sabate, Raimon; Espargaro, Alba; Barbosa-Barros, Lucyanna; *et al.* **Source:** BIOCHIMIE **Volume:** 94 **Issue:** 8 **Pages:** 1730-1738 **DOI:** 10.1016/j.biochi.2012.03.027 **Published:** AUG 2012

- **Title: ROLE OF THE ELECTROSTATIC DEPLETION ATTRACTION ON THE STRUCTURE OF CHARGED LIPOSOME-POLYMER MIXTURES**
  Author(s): Pelaez-Fernandez, M.; Moncho-Jorda, A.; Garcia-Jimeno, S.; *et al.* **Source:** PHYSICAL REVIEW E **Volume:** 85 **Issue:** 5 **Article Number:** 051405 **DOI:** 10.1103/PhysRevE.85.051405 **Part:** Part 1 **Published:** MAY 29 2012

- **Title: BICELLES: LIPID NANOSTRUCTURED PLATFORMS WITH POTENTIAL DERMAL APPLICATIONS**
  Author(s): Barbosa-Barros, Lucyanna; Rodriguez, Gelen; Barba, Clara; *et al.* **Source:** SMALL **Volume:** 8 **Issue:** 6 **Pages:** 807-818 **DOI:** 10.1002/smll.201101545 **Published:** MAR 2012

- **Title: IMPROVED THERMAL ABLATION EFFICACY USING MAGNETIC NANOPARTICLES: A STUDY IN TUMOR PHANTOMS**
  Author(s): Garcia-Jimeno, S.; Ortega-Palacios, R.; Cepeda-Rubio, M. F. J.; *et al.* **Source:** PROGRESS IN ELECTROMAGNETICS RESEARCH-PIER **Volume:** 128 **Pages:** 229-248 **DOI:** 10.2528/PIER12020108 **Published:** 2012

- **Title: LIPOSOMES BEARING FIBRINOGEN COULD POTENTIALLY INTERFERE WITH PLATELET INTERACTION AND PROCOAGULANT ACTIVITY**
  Author(s): Rosa Hernandez, M.; Urban, Patricia; Casals, Elisenda; *et al.* **Source:** INTERNATIONAL JOURNAL OF NANOMEDICINE **Volume:** 7 **Pages:** 2339-2347 **DOI:** 10.2147/IJN.S28542 **Published:** 2012

- **Title: STUDY OF THE EFFICACY OF ANTIMALARIAL DRUGS DELIVERED INSIDE TARGETED IMMUNOLIPOSOMAL NANOVECTORS**
  Author(s): Urban, Patricia; Estelrich, Joan; Adeva, Alberto; *et al.* **Source:** NANOSCALE RESEARCH LETTERS **Volume:** 6 **Article Number:** 620 **DOI:** 10.1186/1556-276X-6-620 **Published:** DEC 7 2011

- **Title: SINGLE-PASS INTESTINAL PERFUSION TO ESTABLISH THE INTESTINAL PERMEABILITY OF MODEL DRUGS IN MOUSE**
  Author(s): Escribano, Elvira; Garcia Sala, Xavier; Salamanca, Jorge; *et al.* **Source:** INTERNATIONAL JOURNAL OF PHARMACEUTICS **Volume:** 436 **Issue:** 1-2 **Pages:** 472-477 **DOI:** 10.1016/j.ijpharm.2012.07.010 **Published:** OCT 15 2012

- **Title: EFFECT OF MAGNET IMPLANT ON IRON BIODISTRIBUTION OF FE@C NANOPARTICLES IN THE MOUSE**
  Author(s): Escribano, Elvira; Fernandez-Pacheco, Rodrigo; Gabriel Valdivia, J.; *et al.* **Source:** ARCHIVES OF PHARMACAL RESEARCH **Volume:** 35 **Issue:** 1 **Pages:** 93-100 **DOI:** 10.1007/s12272-012-0109-8 **Published:** JAN 2012

NANOMAGNETISM, NANOELECTRONICS AND NANOPHOTONICS

- **Title: POLYNUCLEAR CROCONATO-BRIDGED-COPPER(II) COMPLEXES DERIVED FROM TRI- AND TETRA-DENTATE AMINES** **Author(s):** Massoud, Salah S.; Vicente, Ramon; Fontenot, Patricia R.; *et al.* **Source:** POLYHEDRON **Volume:** 46 **Issue:** 1 **Pages:** 66-73 **DOI:** 10.1016/j.poly.2012.07.049 **Published:** OCT 9 2012

- **Title: SYNTHESIS, STRUCTURAL AND MAGNETIC STUDY OF TWO NEW ALTERNATING 1D AZIDO-BRIDGED COBALT(II) COMPLEXES** **Author(s):** Mautner, Franz A.; Sudy, Beate; Berger, Christian; *et al.* **Source:** POLYHEDRON **Volume:** 42 **Issue:** 1 **Pages:** 95-101 **DOI:** 10.1016/j.poly.2012.04.039 **Published:** JUL 25 2012

- **Title: [Mn-2(N-3)(5)](n)(n-): FOUR DIFFERENT AZIDE BRIDGING MODES AND DICUBANE SUBUNITS OBSERVED IN A NEW MN(II)-AZIDE ONLY 2D SYSTEM** **Author(s):** Mautner, Franz A.; Sudy, Beate; Egger, Andreas; *et al.* **Source:** INORGANIC CHEMISTRY COMMUNICATIONS **Volume:** 21 **Pages:** 4-7 **DOI:** 10.1016/j.inoche.2012.03.028 **Published:** JUL 2012

- **Title: HEXANUCLEAR COPPER(II) CAGES BUILT ON A CENTRAL {MU(3)-O CENTER DOT CENTER DOT CENTER DOT H CENTER DOT CENTER DOT CENTER DOT MU(3)-O} MOIETY, 1,3-BIS(DIMETHYLAMINO)-2-PROPANOLATO AND CAPPING R-PHOSPHONATES: CRYSTAL STRUCTURES, MAGNETIC BEHAVIOR, AND DFT STUDIES** **Author(s):** Speed, Saskia; Vicente, Ramon; Aravena, Daniel; *et al.* **Source:** INORGANIC CHEMISTRY **Volume:** 51 **Issue:** 12 **Pages:** 6842-6850 **DOI:** 10.1021/ic300589h **Published:** JUN 18 2012

- **Title: DICYANAMIDO-METAL(II) COMPLEXES. PART 6: 1D POLYMERIC COPPER(II) COMPLEXES BRIDGING BY DICYANAMIDE. EFFECT OF COPPER(II) SALT ON THE NATURE OF THE POLYMERIC PRODUCT** **Author(s):** Massoud, Salah S.; Lemieux, Marcie M.; Le Quan, Lucie; *et al.* **Source:** INORGANICA CHIMICA ACTA **Volume:** 388 **Pages:** 71-77 **DOI:** 10.1016/j.ica.2012.03.009 **Published:** JUN 15 2012

- **Title: A NEW PENTADECANUCLEAR MANGANESE(II,III) TERT-BUTYLPHOSPHONATE CLUSTER: CRYSTAL STRUCTURE AND MAGNETIC BEHAVIOUR** **Author(s):** Mautner, Franz A.; Fischer, Roland C.; El Fallah, M. Salah; *et al.* **Source:** POLYHEDRON **Volume:** 36 **Issue:** 1 **Pages:** 92-96 **DOI:** 10.1016/j.poly.2012.01.029 **Published:** APR 4 2012

- **Title: THREE NEW DINUCLEAR MANGANESE(II) COMPLEXES WITH bis(mu-PHOSPHINATO)-BRIDGES** **Author(s):** Mautner, Franz A.; Speed, Saskia; El Fallah, M. Salah; *et al.* Conference: 12th International Conference on Molecule-Based Magnets (ICMM) Location: Beijing, PEOPLES R CHINA Date: OCT 08-12, 2010
  Source: POLYHEDRON **Volume:** 30 **Issue:** 18 Special **Issue:** SI **Pages:** 3067-3072 **DOI:** 10.1016/j.poly.2011.02.034 **Published:** NOV 28 2011

- **Title: SINGLE-STRAND MOLECULAR WHEELS AND COORDINATION POLYMERS IN COPPER(II) BENZOATE CHEMISTRY BY THE EMPLOYMENT OF A-BENZOIN OXIME AND AZIDES: SYNTHESIS, STRUCTURES, AND MAGNETIC CHARACTERIZATION** **Author(s):** Stamatatos, Theocharis C.; Vlahopoulou, Gina; Raptopoulou, Catherine P.; *et al.* **Source:** EUROPEAN JOURNAL OF INORGANIC CHEMISTRY **Issue:** 19 **Pages:** 3121-3131 **DOI:** 10.1002/ejic.201101292 **Published:** JUL 2012

- **Title: A NOVEL FERROMAGNETICALLY-COUPLED TRINUCLEAR NICKEL(II) COMPLEX CONSTRUCTED FROM THE NEW 1,2-DI(PYRIDIN-2-YL)ETHANONE LIGAND IN ITS ENOLATE FORM** **Author(s):** Guo, Wei; Chen, Xu-Dong; Du, Miao; *et al.* **Source:** INORGANIC CHEMISTRY COMMUNICATIONS **Volume:** 20 **Pages:** 184-187 **DOI:** 10.1016/j.inoche.2012.03.004 **Published:** JUN 2012

- **Title: HIGH NUCLEARITY IN AZIDO/OXIMATE CHEMISTRY: Ni-14 AND Ni-13 CLUSTERS WITH S=6 AND 9 GROUND STATES** **Author(s):** Esteban, Jordi; Alcazar, Laura; Torres-Molina, Maria; *et al.* **Source:** INORGANIC CHEMISTRY **Issue:** 10 **Pages:** 5503-5505 **DOI:** 10.1021/ic3004036 **Published:** MAY 21 2012

- **Title: TRIANGULAR NICKEL COMPLEXES DERIVED FROM 2-PYRIDYLCYANOXIME: AN APPROACH TO THE MAGNETIC PROPERTIES OF THE [Ni3(mu 3-OH){pyC(R)NO}3]2+CORE** **Author(s):** Esteban, Jordi; Ruiz, Eliseo; Font-Bardia, Merce; *et al.* **Source:** CHEMISTRY-A EUROPEAN JOURNAL **Volume:** 18 **Issue:** 12 **Pages:** 3637-3648 **DOI:** 10.1002/chem.201102987 **Published:** MAR 2012

- **Title: SYNTHESIS AND CHARACTERIZATION OF Co-3(III) INVERSE METALLACROWNS VIA USE OF 6-METHYL-2-PYRIDYLALDOXIME** **Author(s):** Vlahopoulou, Gina; Escuer, Albert; Font-Bardia, Merce; *et al.* **Source:** INORGANIC CHEMISTRY COMMUNICATIONS **Volume:** 16 **Pages:** 78-80 **DOI:** 10.1016/j.inoche.2011.11.037 **Published:** FEB 2012

- **Title: EMPLOYMENT OF METHYL 2-PYRIDYL KETONE OXIME IN 3D/4F-METAL CHEMISTRY: DINUCLEAR NICKEL(II)/LANTHANIDE(III) SPECIES AND COMPLEXES CONTAINING THE METALS IN SEPARATE IONS**
  Author(s): Polyzou, Christina D.; Nikolaou, Helen; Papatriantafyllopoulou, Constantina; *et al.* **Source:** DALTON TRANSACTIONS **Volume:** 41 **Issue:** 48 **Pages:** 14712-14712 **Published:** 2012

- **Title: EMPLOYMENT OF METHYL 2-PYRIDYL KETONE OXIME IN 3D/4F-METAL CHEMISTRY: DINUCLEAR NICKEL(II)/LANTHANIDE(III) SPECIES AND COMPLEXES CONTAINING THE METALS IN SEPARATE IONS Author(s):** Polyzou, Christina D.; Nikolaou, Helen; Papatriantafyllopoulou, Constantina; *et al.* **Source:** DALTON TRANSACTIONS **Volume:** 41 **Issue:** 44 **Pages:** 13755-13764 **DOI:** 10.1039/c2dt31928d **Published:** 2012

- **Title: ANION COORDINATION BY METALLAMACROCYCLES: A CRYPTAND-LIKE CAVITY Author(s):** Escuer, Albert; Esteban, Jordi; Font-Bardia, Merce **Source:** CHEMICAL COMMUNICATIONS **Volume:** 48 **Issue:** 78 **Pages:** 9777-9779 **DOI:** 10.1039/c2cc34061e **Published:** 2012

- **Title: THE "PERIODIC TABLE" OF DI-2-PYRIDYL KETONE: VANADIUM COMPLEXES Author(s):** Sartzi, Harikleia; Stoumpos, Constantinos C.; Giouli, Maria; *et al.* **Source:** DALTON TRANSACTIONS **Volume:** 41 **Issue:** 39 **Pages:** 11984-11988 **DOI:** 10.1039/c2dt30710c **Published:** 2012

- **Title: TRIANGULAR Ni(2)(II)Ln(III) AND (Ni2YIII)-Y-II COMPLEXES DERIVED FROM DI-2-PYRIDYL KETONE: SYNTHESIS, STRUCTURES AND MAGNETIC PROPERTIES Author(s):** Georgopoulou, Anastasia N.; Efthymiou, Constantinos G.; Papatriantafyllopoulou, Constantina; *et al.* Conference: 12th International Conference on Molecule-Based Magnets (ICMM) Location: Beijing, PEOPLES R CHINA Date: OCT 08-12, 2010 **Source:** POLYHEDRON **Volume:** 30 **Issue:** 18 Special **Issue:** SI **Pages:** 2978-2986 **DOI:** 10.1016/j.poly.2011.02.010 **Published:** NOV 28 2011

- **Title: LAYERED DOUBLE HYDROXIDES AS CARRIERS FOR QUANTUM DOTS@SILICA NANOSPHERES Author(s):** Stoica, Georgiana; Castello Serrano, Ivan; Figuerola, Albert; *et al.* **Source:** NANOSCALE **Volume:** 4 **Issue:** 17 **Pages:** 5409-5419 **DOI:** 10.1039/c2nr31550e **Published:** 2012

- **Title: SIZE-TUNABLE, HEXAGONAL PLATE-LIKE Cu3P AND JANUS-LIKE Cu-Cu3P NANOCRYSTALS Author(s):** De Trizio, Luca; Figuerola, Albert; Manna, Liberato; *et al.* **Source:** ACS NANO **Volume:** 6 **Issue:** 1 **Pages:** 32-41 **DOI:** 10.1021/nn203702r **Published:** JAN 2012

- **Title: CHEMICAL TRANSFORMATION OF Au-TIPPED CdS NANORODS INTO AuS/Cd CORE/SHELL PARTICLES BY ELECTRON BEAM IRRADIATION Author(s):** van Huis, Marijn A.; Figuerola, Albert; Fang, Changming; *et al.* **Source:** NANO LETTERS **Volume:** 11 **Issue:** 11 **Pages:** 4555-4561 **DOI:** 10.1021/nl2030823 **Published:** NOV 2011

- **Title: LOCAL COORDINATION GEOMETRY AND SPIN STATE IN NOVEL FEII COMPLEXES WITH 2,6-Bis(PYRAZOL-3-YL)PYRIDINE-TYPE LIGANDS AS CONTROLLED BY PACKING FORCES: STRUCTURAL CORRELATIONS Author(s):** Craig, Gavin A.; Sanchez Costa, Jose; Roubeau, Olivier; *et al.* **Source:** CHEMISTRY-A EUROPEAN JOURNAL **Volume:** 18 **Issue:** 37 **Pages:** 11703-11715 **DOI:** 10.1002/chem.201200820 **Published:** SEP 2012

- **Title: SYNTHESIS, CRYSTAL STRUCTURES, MAGNETIC PROPERTIES AND CATECHOLASE ACTIVITY OF DOUBLE PHENOXIDO-BRIDGED PENTA-COORDINATED

- **DINUCLEAR NICKEL(II) COMPLEXES DERIVED FROM REDUCED SCHIFF-BASE LIGANDS: MECHANISTIC INFERENCE OF CATECHOLASE ACTIVITY**
  Author(s): Biswas, Apurba; Das, Lakshmi Kanta; Drew, Michael G. B.; *et al.* **Source:** INORGANIC CHEMISTRY **Volume:** 51 **Issue:** 15 **Pages:** 7993-8001 **DOI:** 10.1021/ic202748m **Published:** AUG 6 2012

- **Title: MOLECULAR [(Fe-3)-(Fe-3)] AND [(Fe-4)-(Fe-4)] COORDINATION CLUSTER PAIRS AS SINGLE OR COMPOSITE ARRAYS**
  Author(s): Carolina Sanudo, E.; Salinas Uber, Jorge; Pons Balague, Alba; *et al.* **Source:** INORGANIC CHEMISTRY **Volume:** 51 **Issue:** 15 **Pages:** 8441-8446 **DOI:** 10.1021/ic300995g **Published:** AUG 6 2012

- **Title: A MOLECULAR [Mn-14] COORDINATION CLUSTER FEATURING TWO SLOWLY RELAXING NANOMAGNETS**
  Author(s): Sanchez Costa, Jose; Barrios, Leoni A.; Craig, Gavin A.; *et al.* **Source:** CHEMICAL COMMUNICATIONS **Volume:** 48 **Issue:** 10 **Pages:** 1413-1415 **DOI:** 10.1039/c1cc15682a **Published:** 2012

- **Title: DESIGN OF MAGNETIC COORDINATION COMPLEXES FOR QUANTUM COMPUTING**
  Author(s): Aromi, Guillem; Aguila, David; Gamez, Patrick; *et al.* **Source:** CHEMICAL SOCIETY REVIEWS **Volume:** 41 **Issue:** 2 **Pages:** 537-546 **DOI:** 10.1039/c1cs15115k **Published:** 2012

- **Title: A Ni-II CUBANE WITH A LIGAND DERIVED FROM A UNIQUE METAL ION-PROMOTED, CROSSED-ALDOL REACTION OF ACETONE WITH DI-2-PYRIDYL KETONE**
  Author(s): Efthymiou, Constantinos G.; Papatriantafyllopoulou, Constantina; Aromi, Guillem; *et al.* **Conference:** 12th International Conference on Molecule-Based Magnets (ICMM) **Location:** Beijing, PEOPLES R CHINA Date: OCT 08-12, 2010 **Source:** POLYHEDRON **Volume:** 30 **Issue:** 18 **Special Issue:** SI **Pages:** 3022-3025 **DOI:** 10.1016/j.poly.2011.02.024 **Published:** NOV 28 2011

- **Title: ENHANCEMENT OF THE SUPERCONDUCTING CRITICAL TEMPERATURE IN Nb/Py/Nb TRILAYERS**
  Author(s): Ilyina, E. A.; Hernandez, J. M.; Garcia-Santiago, A.; *et al.* **Source:** PHYSICA C-SUPERCONDUCTIVITY AND ITS APPLICATIONS **Volume:** 479 **Pages:** 170-172 **DOI:** 10.1016/j.physc.2011.12.031 **Published:** SEP 2012

- **Title: MAGNETOIMPEDANCE SPECTROSCOPY OF EPITAXIAL MULTIFERROIC THIN FILMS**
  Author(s): Schmidt, Rainer; Ventura, Jofre; Langenberg, Eric; *et al.* **Source:** PHYSICAL REVIEW B **Volume:** 86 **Issue:** 3 **Article Number:** 035113 **DOI:** 10.1103/PhysRevB.86.035113 **Published:** JUL 10 2012

- **Title: QUANTUM DEPINNING OF THE MAGNETIC VORTEX CORE IN MICRON-SIZE PERMALLOY DISKS**
  Author(s): Zarzuela, Ricardo; Velez, Saúl; Manel Hernandez, Joan; *et al.* **Source:** PHYSICAL REVIEW B **Volume:** 85 **Issue:** 18 **Article Number:** 180401 **DOI:** 10.1103/PhysRevB.85.180401 **Published:** MAY 3 2012

- **Title: ANISOTROPIC MAGNETIC DEFLAGRATION IN SINGLE CRYSTALS OF Gd5Ge4**
  Author(s): Velez, S.; Hernandez, J. M.; Garcia-Santiago, A.; *et al.* **Source:** PHYSICAL REVIEW B **Volume:** 85 **Issue:** 5 **Article Number:** 054432 **DOI:** 10.1103/PhysRevB.85.054432 **Published:** FEB 28 2012

- **Title: MAGNETIC FIELD DEPENDENCE OF THE QUANTUM TUNNELING OF NORMAL-SUPERCONDUCTOR INTERFACES IN A TYPE-I Pb SUPERCONDUCTOR**
  Author(s): Velez, Saúl; Zarzuela, Ricardo; Garcia-Santiago, Antoni; *et al.* **Source:** PHYSICAL REVIEW B **Volume:** 85 **Issue:** 6 **Article Number:** 064506 **DOI:** 10.1103/PhysRevB.85.064506 **Published:** FEB 7 2012

- **Title: DISSIPATIVE MACROSCOPIC QUANTUM TUNNELING IN TYPE-I SUPERCONDUCTORS**
  Author(s): Zarzuela, R.; Chudnovsky, E. M.; Tejada, J. **Source:** PHYSICAL REVIEW B **Volume:** 84 **Issue:** 18 **Article Number:** 184525 **DOI:** 10.1103/PhysRevB.84.184525 **Published:** NOV 28 2011

- **Title: TRANSPORT IN QUANTUM DOT STACKS USING THE TRANSFER HAMILTONIAN METHOD IN SELF-CONSISTENT FIELD REGIME**
  Author(s): Illera, S.; Prades, J. D.; Cirera, A.; *et al.* **Source:** EPL **Volume:** 98 **Issue:** 1 **Article Number:** 17003 **DOI:** 10.1209/0295-5075/98/17003 **Published:** APR 2012

- **Title: STRUCTURAL FACTORS IMPACTING CARRIER TRANSPORT AND ELECTROLUMINESCENCE FROM Si NANOCLUSTER-SENSITIZED Er IONS**
  Author(s): Cueff, Sebastien; Labbe, Christophe; Jambois, Olivier; *et al.* **Source:** OPTICS EXPRESS **Volume:** 20 **Issue:** 20 **Pages:** 22490-22502 **Published:** SEP 24 2012

- **Title: LIMIT TO THE ERBIUM IONS EMISSION IN SILICON-RICH OXIDE FILMS BY ERBIUM ION CLUSTERING**
  Author(s): Prtljaga, Nikola; Navarro-Urrios, Daniel; Tengattini, Andrea; *et al.*
  Source: OPTICAL MATERIALS EXPRESS **Volume:** 2 **Issue:** 9 **Pages:** 1278-1285 **Published:** SEP 1 2012

- **Title: CORRELATION BETWEEN CHARGE TRANSPORT AND ELECTROLUMINESCENCE PROPERTIES OF Si-RICH OXIDE/NITRIDE/OXIDE-BASED LIGHT EMITTING CAPACITORS**
  Author(s): Berencen, Y.; Ramirez, J. M.; Jambois, O.; *et al.* **Source:** JOURNAL OF APPLIED PHYSICS **Volume:** 112 **Issue:** 3 **Article Number:** 033114 **DOI:** 10.1063/1.4742054 **Published:** AUG 1 2012

- **Title: SILICON-RICH OXYNITRIDE HOSTS FOR 1.5 mu M Er3+ EMISSION FABRICATED BY REACTIVE AND STANDARD RF MAGNETRON SPUTTERING**
  Author(s): Cueff, S.; Labbe, C.; Khomenkova, L.; *et al.* **Source:** MATERIALS SCIENCE AND ENGINEERING B-ADVANCED FUNCTIONAL SOLID-STATE MATERIALS **Volume:** 177 **Issue:** 10 Special **Issue:** SI **Pages:** 725-728 **DOI:** 10.1016/j.mseb.2011.12.007 **Published:** JUN 5 2012

- **Title: POLARIZATION STRATEGIES TO IMPROVE THE EMISSION OF Si-BASED LIGHT SOURCES EMITTING AT 1.55 mu M**

Author(s): Ramirez, J. M.; Jambois, O.; Berencen, Y.; *et al.* **Source:** MATERIALS SCIENCE AND ENGINEERING B-ADVANCED FUNCTIONAL SOLID-STATE MATERIALS **Volume:** 177 **Issue:** 10 **Special Issue:** SI **Pages:** 734-738 **DOI:** 10.1016/j.mseb.2011.12.023 **Published:** JUN 5 2012

- **Title: SILICON NANOCLUSTER SENSITIZATION OF ERBIUM IONS UNDER LOW-ENERGY OPTICAL EXCITATION**
  Author(s): Prtljaga, Nikola; Navarro-Urrios, Daniel; Pitanti, Alessandro; *et al.*
  Source: JOURNAL OF APPLIED PHYSICS**Volume:** 111 **Issue:** 9 **Article Number:** 094314 **DOI:** 10.1063/1.4712626 **Published:** MAY 1 2012

- **Title: ERBIUM EMISSION IN MOS LIGHT EMITTING DEVICES: FROM ENERGY TRANSFER TO DIRECT IMPACT EXCITATION Author(s):** Ramirez, J. M.; Ferrarese Lupi, F.; Jambois, O.; *et al.* **Source:** NANOTECHNOLOGY **Volume:** 23 **Issue:** 12**Article Number:** 125203 **DOI:** 10.1088/0957-4484/23/12/125203 **Published:** MAR 30 2012

- **Title: BIPOLAR PULSED EXCITATION OF ERBIUM-DOPED NANOSILICON LIGHT EMITTING DIODES**
  Author(s): Anopchenko, A.; Tengattini, A.; Marconi, A.; *et al.* **Source:** JOURNAL OF APPLIED PHYSICS **Volume:** 111 **Issue:** 6 **Article Number:** 063102 **DOI:** 10.1063/1.3694680 **Published:** MAR 15 2012

- **Title: EFFECT OF THE ANNEALING TREATMENTS ON THE ELECTROLUMINESCENCE EFFICIENCY OF SiO2 LAYERS DOPED WITH Si AND Er**
  Author(s): Jambois, O.; Ramirez, J. M.; Berencen, Y.; *et al.* **Source:** JOURNAL OF PHYSICS D-APPLIED PHYSICS **Volume:** 45 **Issue:** 4 **Article Number:** 045103 **DOI:** 10.1088/0022-3727/45/4/045103 **Published:** FEB 1 2012

- **Title: VISIBLE LIGHT EMITTING Si-RICH Si3N4 mu-DISK RESONATORS FOR SENSORISTIC APPLICATIONS**
  Author(s): Ferrarese Lupi, Federico; Navarro-Urrios, Daniel; Rubio-Garcia, Javier; *et al.* **Source:** JOURNAL OF LIGHTWAVE TECHNOLOGY **Volume:** 30 **Issue:** 1 **Pages:** 169-174 **DOI:** 10.1109/JLT.2011.2179286 **Published:** JAN 1 2012

- **Title: COPROPAGATING PUMP AND PROBE EXPERIMENTS ON Si-nc IN SiO2 RIB WAVEGUIDES DOPED WITH Er: THE OPTICAL ROLE OF NON-EMITTING IONS**
  Author(s): Navarro-Urrios, D.; Ferrarese Lupi, F.; Prtljaga, N.; *et al.* **Source:** APPLIED PHYSICS LETTERS **Volume:** 99 **Issue:** 23 **Article Number:** 231114 **DOI:** 10.1063/1.3665950 **Published:** DEC 5 2011

- **Title: OPTOELECTRONIC PROPERTIES OF InAlN/GaN DISTRIBUTED BRAGG REFLECTOR HETEROSTRUCTURE EXAMINED BY VALENCE ELECTRON ENERGY LOSS SPECTROSCOPY**
  Author(s): Eljarrat, A.; Estrade, S.; Gacevic, Z.; *et al.* **Source:** MICROSCOPY AND MICROANALYSIS **Volume:** 18 **Issue:** 5 **Pages:** 1143-1154 **DOI:** 10.1017/S1431927612001328 **Published:** OCT 2012

- **Title: SELECTIVE AREA GROWTH OF A- AND C-PLANE GaN NANOCOLUMNS BY MOLECULAR BEAM EPITAXY USING COLLOIDAL NANOLITHOGRAPHY**

Author(s): Bengoechea-Encabo, A.; Albert, S.; Sanchez-Garcia, M. A.; *et al.* **Source:** JOURNAL OF CRYSTAL GROWTH **Volume:** 353 **Issue:** 1 **Pages:** 1-4 **DOI:** 10.1016/j.jcrysgro.2011.11.069 **Published:** AUG 15 2012

- **Title: ASSESSMENT OF MISORIENTATION IN METALLIC AND SEMICONDUCTING NANOWIRES USING PRECESSION ELECTRON DIFFRACTION**
  Author(s): Estrade, Sonia; Portillo, Joaquim; Mendoza, Joan; *et al.* **Source:** MICRON **Volume:** 43 **Issue:** 8 **Pages:** 910-915 **DOI:** 10.1016/j.micron.2012.03.003 **Published:** AUG 2012

- **Title: SURFACE REACTIVITY OF IRON OXIDE NANOPARTICLES BY MICROWAVE-ASSISTED SYNTHESIS; COMPARISON WITH THE THERMAL DECOMPOSITION ROUTE**
  Author(s): Pascu, Oana; Carenza, Elisa; Gich, Marti; *et al.* **Source:** JOURNAL OF PHYSICAL CHEMISTRY C **Volume:** 116 **Issue:** 28 **Pages:** 15108-15116 **DOI:** 10.1021/jp303204d **Published:** JUL 19 2012

- **Title: HETEROEPITAXIAL GROWTH OF MgO(111) THIN FILMS ON Al2O3(0001): EVIDENCE OF A WURTZITE TO ROCKSALT TRANSFORMATION**
  Author(s): Martinez-Boubeta, Carlos; Botana, Antia S.; Pardo, Victor; *et al.* **Source:** PHYSICAL REVIEW B **Volume:** 86 **Issue:** 4 **Article Number:** 041407 **DOI:** 10.1103/PhysRevB.86.041407 **Published:** JUL 19 2012

- **Title: EELS SIGNAL ENHANCEMENT BY MEANS OF BEAM PRECESSION IN THE TEM**
  Author(s): Estrade, Sonia; Portillo, Joaquim; Yedra, Lluis; *et al.* **Source:** ULTRAMICROSCOPY **Volume:** 116 **Pages:** 135-137 **DOI:** 10.1016/j.ultramic.2012.03.018 **Published:** MAY 2012

- **Title: STRONGLY EXCHANGE COUPLED INVERSE FERRIMAGNETIC SOFT/HARD, MnxFe3-xO4/FexMn3-xO4, CORE/SHELL HETEROSTRUCTURED NANOPARTICLES**
  Author(s): Lopez-Ortega, A.; Estrader, M.; Salazar-Alvarez, G.; *et al.* **Source:** NANOSCALE **Volume:** 4 **Issue:** 16 **Pages:** 5138-5147 **DOI:** 10.1039/c2nr30986f **Published:** 2012

- **Title: ELECTRIC TRANSPORT THROUGH NANOMETRIC CoFe2O4 THIN FILMS INVESTIGATED BY CONDUCTING ATOMIC FORCE MICROSCOPY**
  Author(s): Foerster, M.; Gutierrez, D. F.; Rebled, J. M.; *et al.* **Source:** JOURNAL OF APPLIED PHYSICS **Volume:** 111 **Issue:** 1 **Article Number:** 013904 **DOI:** 10.1063/1.3672839 **Published:** JAN 1 2012

- **Title: DISTINGUISHING THE CORE FROM THE SHELL IN MnOx/MnOy AND FeOx/MnOx CORE/SHELL NANOPARTICLES THROUGH QUANTITATIVE ELECTRON ENERGY LOSS SPECTROSCOPY (EELS) ANALYSIS**
  Author(s): Estrade, S.; Yedra, Ll; Lopez-Ortega, A.; *et al.* **Source:** MICRON **Volume:** 43 **Issue:** 1 **Special Issue:** SI **Pages:** 30-36 **DOI:** 10.1016/j.micron.2011.04.002 **Published:** JAN 2012

- **Title: SYNTHESIS AND MAGNETIC CHARACTERIZATION OF COAXIAL Ge1-xMnx/a-Si HETEROSTRUCTURES**
  Author(s): Barth, Sven; Kazakova, Olga; Estrade, Sonia; *et al.*
  Source: CRYSTAL GROWTH & DESIGN **Volume:** 11 **Issue:** 12 **Pages:** 5253-5259 **DOI:** 10.1021/cg200667r **Published:** DEC 2011

- **Title: EFFECT OF THE CAPPING ON THE LOCAL MN OXIDATION STATE IN BURIED (001) AND (110) SrTiO3/La2/3Ca1/3MnO3 INTERFACES**
  Author(s): Estrade, S.; Rebled, J. M.; Walls, M. G.; *et al.* **Source:** JOURNAL OF APPLIED PHYSICS **Volume:** 110 **Issue:** 10 **Article Number:** 103903 **DOI:** 10.1063/1.3660786 **Published:** NOV 15 2011

- **Title: LOCALIZED GROWTH AND IN SITU INTEGRATION OF NANOWIRES FOR DEVICE APPLICATIONS**
  Author(s): Barth, Sven; Jimenez-Diaz, Roman; Sama, Jordi; *et al.* **Source:** CHEMICAL COMMUNICATIONS **Volume:** 48 **Issue:** 39 **Pages:** 4734-4736 **DOI:** 10.1039/c2cc30920c **Published:** 2012

- **Title: STABILITY MODEL OF SILICON NANOWIRE POLYMORPHS AND FIRST-PRINCIPLE CONDUCTIVITY OF BULK SILICON**
  Author(s): Garcia-Castelo, Nuria; Prades, J. Daniel; Orlando, Roberto; *et al.* **Source:** JOURNAL OF PHYSICAL CHEMISTRY C **Volume:** 116 **Issue:** 41 **Pages:** 22078-22085 **DOI:** 10.1021/jp307449y **Published:** OCT 18 2012

- **Title: HIGH TEMPERATURE PHASE STABILITY AND CHEMICAL ANALYSIS OF THE HIGHLY DOPED YTTRIA STABILIZED ZIRCONIA WITH ALUMINA**
  Author(s): Nazarpour, S.; Lopez-Gandara, C.; Ramos, F. M.; *et al.* **Source:** CERAMICS INTERNATIONAL **Volume:** 38 **Issue:** 6 **Pages:** 4813-4818 **DOI:** 10.1016/j.ceramint.2012.02.069 **Published:** AUG 2012

- **Title: FASTEST THERMAL ISOMERIZATION OF AN AZOBENZENE FOR NANOSECOND PHOTOSWITCHING APPLICATIONS UNDER PHYSIOLOGICAL CONDITIONS**
  Author(s): Garcia-Amoros, Jaume; Diaz-Lobo, Mireia; Nonell, Santi; *et al.* **Source:** ANGEWANDTE CHEMIE-INTERNATIONAL EDITION **Volume:** 51 **Issue:** 51 **Pages:** 12820-12823 **DOI:** 10.1002/anie.201207602 **Published:** 2012

- **Title: PHOTO-CONTROLLABLE ELECTRONIC SWITCHES BASED ON AZOPYRIDINE DERIVATIVES**
  Author(s): Garcia-Amoros, Jaume; Gomez, Elvira; Valles, Elisa; *et al.* **Source:** CHEMICAL COMMUNICATIONS **Volume:** 48 **Issue:** 72 **Pages:** 9080-9082 **DOI:** 10.1039/c2cc34457b **Published:** 2012

- **Title: LIGHT-CONTROLLED REAL TIME INFORMATION TRANSMITTING SYSTEMS BASED ON NANOSECOND THERMALLY-ISOMERISING AMINO-AZOPYRIDINIUM SALTS**
  Author(s): Garcia-Amoros, Jaume; Nonell, Santi; Velasco, Dolores **Source:** CHEMICAL COMMUNICATIONS **Volume:** 48 **Issue:** 28 **Pages:** 3421-3423 **DOI:** 10.1039/c2cc17782j **Published:** 2012

- **Title: SURFACTANT ORGANIC MOLECULES RESTORE MAGNETISM IN METAL-OXIDE NANOPARTICLE SURFACES**
  Author(s): Salafranca, Juan; Gazquez, Jaume; Perez, Nicolas; *et al.* **Source:** NANO LETTERS **Volume:** 12 **Issue:** 5 **Pages:** 2499-2503 **DOI:** 10.1021/nl300665z **Published:** MAY 2012

- **Title: GLASSY MAGNETIC PHASE DRIVEN BY SHORT-RANGE CHARGE AND MAGNETIC ORDERING IN NANOCRYSTALLINE La1/3Sr2/3FeO3-DELTA: MAGNETIZATION, MOSSBAUER, AND POLARIZED NEUTRON STUDIES**
  Author(s): Sabyasachi, Sk.; Patra, M.; Majumdar, S.; *et al.* **Source:** PHYSICAL REVIEW B **Volume:** 86 **Issue:** 10 **Article Number:** 104416 **DOI:** 10.1103/PhysRevB.86.104416 **Published:** SEP 12 2012

NANOSTRUCTURED MATERIALS

- **Title: MEASUREMENT OF THE GIANT MAGNETORESISTANCE EFFECT IN COBALT-SILVER MAGNETIC NANOSTRUCTURES: NANOPARTICLES**
  Author(s): Garcia-Torres, Jose; Valles, Elisa; Gomez, Elvira **Source:** NANOTECHNOLOGY **Volume:** 23 **Issue:** 40 **Article Number:** 405701 **DOI:** 10.1088/0957-4484/23/40/405701 **Published:** OCT 12 2012

- **Title: DESIGN AND ELECTROCHEMICAL PREPARATION OF INDUCTIVE COPPER COILS FOR MAGNETIC PARTICLES DETECTION**
  Author(s): Cortes, M.; Martinez, S.; Serre, C.; *et al.* **Source:** SENSORS AND ACTUATORS B-CHEMICAL **Volume:** 173 **Pages:** 737-744 **DOI:** 10.1016/j.snb.2012.07.096 **Published:** OCT 2012

- **Title: ELECTRODEPOSITED CoPt FILMS FROM A DEEP EUTECTIC SOLVENT**
  Author(s): Guillamat, P.; Cortes, M.; Valles, E.; *et al.* **Source:** SURFACE & COATINGS TECHNOLOGY **Volume:** 206 **Issue:** 21 **Pages:** 4439-4448 **DOI:** 10.1016/j.surfcoat.2012.04.093 **Published:** JUL 15 2012

- **Title: MEASUREMENT OF THE GIANT MAGNETORESISTANCE EFFECT IN COBALT-SILVER MAGNETIC NANOSTRUCTURES: NANOWIRES**
  Author(s): Garcia-Torres, Jose; Gomez, Elvira; Valles, Elisa **Source:** JOURNAL OF PHYSICAL CHEMISTRY C **Volume:** 116 **Issue:** 22 **Pages:** 12250-12257 **DOI:** 10.1021/jp300119w **Published:** JUN 7 2012

- **Title: MAGNETIC CoPt (60-70 wt%Pt) MICROSTRUCTURES FABRICATED BY THE ELECTROCHEMICAL METHOD**
  Author(s): Cortes, M.; Gomez, E.; Valles, E. **Source:** JOURNAL OF MICROMECHANICS AND MICROENGINEERING **Volume:** 22 **Issue:** 5 **Article Number:** 055016 **DOI:** 10.1088/0960-1317/22/5/055016 **Published:** MAY 2012

- **Title: DEVELOPING PLATING BATHS FOR THE PRODUCTION OF REFLECTIVE Ni-Cu FILMS**
  Author(s): Calleja, P.; Esteve, J.; Cojocaru, P.; *et al.* **Source:** ELECTROCHIMICA ACTA **Volume:** 62 **Pages:** 381-389 **DOI:** 10.1016/j.electacta.2011.12.049 **Published:** FEB 15 2012

- **Title: USING DEEP EUTECTIC SOLVENTS TO ELECTRODEPOSIT CoSm FILMS AND NANOWIRES**

Author(s): Cojocaru, P.; Magagnin, L.; Gomez, E.; *et al.* **Source:** MATERIALS LETTERS **Volume:** 65 **Issue:** 23-24 **Pages:** 3597-3600 **DOI:** 10.1016/j.matlet.2011.08.003 **Published:** DEC 2011

- **Title: PULSE PLATED CoP ALLOY AS SUBSTITUTE FOR HARD CHROMIUM ELECTRODEPOSITS**
  Author(s): Kosta, I.; Imaz, N.; Cinca, N.; *et al.* **Source:** TRANSACTIONS OF THE INSTITUTE OF METAL FINISHING **Volume:** 90 **Issue:** 5 **Pages:** 252-258 **DOI:** 10.1179/0020296712Z.00000000047 **Published:** SEP 2012

- **Title: MIXED AMORPHOUS-NANOCRYSTALLINE COBALT PHOSPHOROUS BY PULSE PLATING**
  Author(s): Kosta, I.; Vicenzo, A.; Mueller, C.; *et al.* **Source:** SURFACE & COATINGS TECHNOLOGY **Volume:** 207 **Pages:** 443-449 **DOI:** 10.1016/j.surfcoat.2012.07.047 **Published:** AUG 25 2012

- **Title: MECHANICAL PROPERTIES AT NANOMETRIC SCALE OF ALUMINA LAYERS FORMED IN SULPHURIC ACID ANODIZING UNDER BURNING CONDITIONS**
  Author(s): Roa, J. J.; Gaston-Garcia, B.; Garcia-Lecina, E.; *et al.* **Source:** CERAMICS INTERNATIONAL **Volume:** 38 **Issue:** 2 **Pages:** 1627-1633 **DOI:** 10.1016/j.ceramint.2011.09.053 **Published:** MAR 2012

- **Title: SULPHURIC ACID ANODISING OF EN AC-46500 CAST ALUMINIUM ALLOY**
  Author(s): Gaston-Garcia, B.; Garcia-Lecina, E.; Diaz-Fuentes, M.; *et al.* **Source:** TRANSACTIONS OF THE INSTITUTE OF METAL FINISHING **Volume:** 89 **Issue:** 6 **Pages:** 312-319 **DOI:** 10.1179/174591911X13167804921037 **Published:** NOV 2011 **Times Cited:** 0 (from Web of Science)

- **Title: NEUTRAL P-CYMENE RUTHENIUM COMPLEXES WITH P-STEREOGENIC MONOPHOSPHINES. NEW CATALYTIC PRECURSORS IN ENANTIOSELECTIVE TRANSFER HYDROGENATION AND CYCLOPROPANATION**
  Author(s): Grabulosa, Arnald; Mannu, Alberto; Mezzetti, Antonio; *et al.* **Source:** JOURNAL OF ORGANOMETALLIC CHEMISTRY **Volume:** 696 **Issue:** 26 **Pages:** 4221-4228 **DOI:** 10.1016/j.jorganchem.2011.09.015 **Published:** JAN 1 2012

- **Title: ANISOTROPIC SURFACE PROPERTIES OF MICRO/NANOSTRUCTURED A-C:H:F THIN FILMS WITH SELF-ASSEMBLY APPLICATIONS**
  Author(s): Freire, V. -M.; Corbella, C.; Bertran, E.; *et al.* **Source:** JOURNAL OF APPLIED PHYSICS **Volume:** 111 **Issue:** 12 **Article Number:** 124323 **DOI:** 10.1063/1.4730783 **Published:** JUN 15 2012

- **Title: STRUCTURE AND PHYSICAL PROPERTIES OF COLLOIDAL CRYSTALS MADE OF SILICA PARTICLES**
  Author(s): Portal-Marco, Sabine; Angels Vallve, Ma; Arteaga, Oriol; *et al.* **Source:** COLLOIDS AND SURFACES A-PHYSICOCHEMICAL AND ENGINEERING ASPECTS **Volume:** 401 **Pages:** 38-47 **DOI:** 10.1016/j.colsurfa.2012.03.007 **Published:** MAY 5 2012

- **Title: NANOPARTICLES IN SiH4-Ar PLASMA: MODELLING AND COMPARISON WITH EXPERIMENTAL DATA**
  Author(s): Gordiets, B. F.; Inestrosa-Izurieta, M. J.; Navarro, A.; *et al.* **Source:** JOURNAL OF APPLIED PHYSICS **Volume:** 110 **Issue:** 10 **Article Number:** 103302 **DOI:** 10.1063/1.3658249

Published: NOV 15 2011 **Times Cited:** 0 (from Web of Science)

- **Title: FUNCTIONALIZATION OF CARBON NANOTUBES BY WATER PLASMA**
  Author(s): Hussain, S.; Amade, R.; Jover, E.; *et al.* **Source:** NANOTECHNOLOGY **Volume:** 23 **Issue:** 38 **Article Number:** 385604 **DOI:** 10.1088/0957-4484/23/38/385604 **Published:** SEP 28 2012

- **Title: VERTICALLY ALIGNED CARBON NANOTUBES FOR MICROELECTRODE ARRAYS APPLICATIONS**
  Author(s): Castro Smirnov, J. R.; Jover, Eric; Amade, Roger; *et al.* **Source:** JOURNAL OF NANOSCIENCE AND NANOTECHNOLOGY **Volume:** 12 **Issue:** 9 **Pages:** 6941-6947 **DOI:** 10.1166/jnn.2012.5867 **Published:** SEP 2012

- **Title: KINETIC CONTROL OF THE SUPRAMOLECULAR CHIRALITY OF PORPHYRIN J-AGGREGATES**
  Author(s): Sorrenti, Alessandro; El-Hachemi, Zoubir; Arteaga, Oriol; *et al.* **Source:** CHEMISTRY-A EUROPEAN JOURNAL **Volume:** 18 **Issue:** 28 **Pages:** 8820-8826 **DOI:** 10.1002/chem.201200881 **Published:** JUL 9 2012

- **Title: FLOW EFFECTS IN SUPRAMOLECULAR CHIRALITY**
  Author(s): Arteaga, Oriol; Canillas, Adolf; Crusats, Joaquim; *et al.* **Source:** ISRAEL JOURNAL OF CHEMISTRY **Volume:** 51 **Issue:** 10 **Special Issue:** SI **Pages:** 1007-1016 **DOI:** 10.1002/ijch.201100043 **Published:** NOV 2011

- **Title: MICRO-, MESO-, AND MACROPOROUS MATERIALS OBTAINED FROM A HIGHLY CONCENTRATED EMULSION OF DECANE/BRIJ 35/WATER AND DECANE/BRIJ 700/WATER**
  Author(s): Santamaria, Esther; Cortes, Marta; Maestro, Alicia; *et al.* **Source:** CHEMISTRY LETTERS **Volume:** 41 **Issue:** 10 **Special Issue:** SI **Pages:** 1041-1043 **DOI:** 10.1246/cl.2012.1041 **Published:** OCT 5 2012

- **Title: STUDY OF NANO-EMULSION FORMATION BY DILUTION OF MICROEMULSIONS**
  Author(s): Sole, I.; Solans, C.; Maestro, A.; *et al.* **Source:** JOURNAL OF COLLOID AND INTERFACE SCIENCE **Volume:** 376 **Pages:** 133-139 **DOI:** 10.1016/j.jcis.2012.02.063 **Published:** JUN 15 2012

- **Title: TAILORED JEFFAMINE MOLECULAR TOOLS FOR ORDERING MESOPOROUS SILICA**
  Author(s): May, A.; Pasc, A.; Stebe, M. J.; *et al.* **Source:** LANGMUIR **Volume:** 28 **Issue:** 25 **Pages:** 9816-9824 **DOI:** 10.1021/la301413u **Published:** JUN 26 2012

- **Title: EFFECT OF THE BIAS VOLTAGE ON THE STRUCTURE OF nc-CrC/a-C:H COATINGS WITH HIGH CARBON CONTENT**
  Author(s): Yate, L.; Martinez-de-Olcoz, L.; Esteve, J.; *et al.* **Source:** SURFACE & COATINGS TECHNOLOGY **Volume:** 206 **Issue:** 11-12 **Pages:** 2877-2883 **DOI:** 10.1016/j.surfcoat.2011.12.015 **Published:** FEB 15 2012

- **Title: IMPROVEMENT OF MECHANICAL AND TRIBOLOGICAL PROPERTIES IN**

STEEL SURFACES BY USING TITANIUM-ALUMINUM/TITANIUM-ALUMINUM NITRIDE MULTILAYERED SYSTEM
Author(s): Ipaz, L.; Caicedo, J. C.; Esteve, J.; *et al.* **Source:** APPLIED SURFACE SCIENCE **Volume:** 258 **Issue:** 8 **Pages:** 3805-3814 **DOI:** 10.1016/j.apsusc.2011.12.033 **Published:** FEB 1 2012

- **Title: PREDICTING EFFECTS OF STRUCTURAL STRESS IN A GENOME-REDUCED MODEL BACTERIAL METABOLISM**
  Author(s): Guell, Oriol; Sagues, Francesc; Angeles Serrano, M. **Source:** SCIENTIFIC REPORTS **Volume:** 2 **Article Number:** 621 **DOI:** 10.1038/srep00621 **Published:** AUG 29 2012

- **Title: ANTIPERSISTENT RANDOM WALK IN A TWO STATE FLASHING MAGNETIC POTENTIAL**
  Author(s): Tierno, Pietro; Sagues, Francesc; Johansen, Tom H.; *et al.* **Source:** PHYSICAL REVIEW LETTERS **Volume:** 109 **Issue:** 7 **Article Number:** 070601 **DOI:** 10.1103/PhysRevLett.109.070601 **Published:** AUG 16 2012

- **Title: STEERING TRAJECTORIES IN MAGNETICALLY ACTUATED COLLOIDAL PROPELLERS**
  Author(s): Tierno, P.; Sagues, F. **Source:** EUROPEAN PHYSICAL JOURNAL E **Volume:** 35 **Issue:** 8 **Article Number:** 71 **DOI:** 10.1140/epje/i2012-12071-4 **Published:** AUG 2012

- **Title: STIRRING COMPETES WITH CHEMICAL INDUCTION IN CHIRAL SELECTION OF SOFT MATTER AGGREGATES**
  Author(s): Petit-Garrido, Nuria; Claret, Josep; Ignes-Mullol, Jordi; *et al.* **Source:** NATURE COMMUNICATIONS **Volume:** 3 **Article Number:** 1001 **DOI:** 10.1038/ncomms1987 **Published:** AUG 2012

- **Title: ROLE OF ANISOTROPY IN ELECTRODYNAMICALLY INDUCED COLLOIDAL AGGREGATES**
  Author(s): Hernandez-Navarro, Sergi; Ignes-Mullol, Jordi; Sagues, Francesc; *et al.* **Source:** LANGMUIR **Volume:** 28 **Issue:** 14 **Pages:** 5981-5986 **DOI:** 10.1021/la3002493 **Published:** APR 10 2012

- **Title: CHIRAL-SYMMETRY SELECTION IN SOFT MONOLAYERS UNDER VORTICAL FLOW**
  Author(s): Petit-Garrido, Nuria; Claret, Josep; Ignes-Mullol, Jordi; *et al.* **Source:** CHEMISTRY-A EUROPEAN JOURNAL **Volume:** 18 **Issue:** 13 **Pages:** 3975-3980 **DOI:** 10.1002/chem.201102358 **Published:** MAR 2012

- **Title: UNCOVERING THE HIDDEN GEOMETRY BEHIND METABOLIC NETWORKS**
  Author(s): Angeles Serrano, M.; Boguna, Marian; Sagues, Francesc **Source:** MOLECULAR BIOSYSTEMS **Volume:** 8 **Issue:** 3 **Pages:** 843-850 **DOI:** 10.1039/c2mb05306c **Published:** 2012

- **Title: MAGNETICALLY RECONFIGURABLE COLLOIDAL PATTERNS ARRANGED FROM ARRAYS OF SELF-ASSEMBLED MICROSCOPIC DIMERS**
  Author(s): Tierno, Pietro **Source:** SOFT MATTER **Volume:** 8 **Issue:** 45 **Pages:** 11443-11446 **DOI:** 10.1039/c2sm26735g **Published:** 2012

NANOENERGY: PRODUCTION, STORAGE AND ENVIRONMENT

- **Title: PERFORMANCE AND SHORT-TERM STABILITY OF SINGLE-CHAMBER SOLID OXIDE FUEL CELLS BASED ON La0.9Sr0.1Ga0.8Mg0.2O3-DELTA ELECTROLYTE**
  Author(s): Morales, M.; Roa, J. J.; Tartaj, J.; *et al.* **Source:** JOURNAL OF POWER SOURCES **Volume:** 216 **Pages:** 417-424 **DOI:** 10.1016/j.jpowsour.2012.05.076 **Published:** OCT 15 2012

- **Title: PROCESSING OF GRADED ANODE-SUPPORTED MICRO-TUBULAR SOFCs BASED ON SAMARIA-DOPED CERIA VIA GEL-CASTING AND SPRAY-COATING**
  Author(s): Morales, M.; Navarro, M. E.; Capdevila, X. G.; *et al.* **Source:** CERAMICS INTERNATIONAL **Volume:** 38 **Issue:** 5 **Pages:** 3713-3722 **DOI:** 10.1016/j.ceramint.2012.01.015 **Published:** JUL 2012

- **Title: CONTACT MECHANICS AT NANOMETRIC SCALE USING NANOINDENTATION TECHNIQUE FOR BRITTLE AND DUCTILE MATERIALS**
  Author(s): Roa, J. J.; Rayon, E.; Morales, M.; *et al.* **Source:** RECENT PATENTS ON NANOTECHNOLOGY **Volume:** 6 **Issue:** 2 **Pages:** 142-152 **Published:** JUN 2012

- **Title: CORROSION INDUCED DEGRADATION OF TEXTURED YBCO UNDER OPERATION IN HIGH HUMIDITY CONDITIONS**
  Author(s): Roa, J. J.; Jimenez-Pique, E.; Diaz, J.; *et al.* **Source:** SURFACE & COATINGS TECHNOLOGY **Volume:** 206 **Issue:** 19-20 **Pages:** 4256-4261 **DOI:** 10.1016/j.surfcoat.2012.04.035 **Published:** MAY 25 2012

- **Title: NANOINDENTATION OF BRIDGMAN YBCO SAMPLES**
  Author(s): Roa, J. J.; Konstantopoulou, K.; Jimenez-Pique, E.; *et al.* **Source:** CERAMICS INTERNATIONAL **Volume:** 38 **Issue:** 3 **Pages:** 2035-2042 **DOI:** 10.1016/j.ceramint.2011.10.039 **Published:** APR 2012

- **Title: MANUFACTURING OF ANODE-SUPPORTED TUBULAR SOLID OXIDE FUEL CELLS BY A NEW SHAPING TECHNIQUE USING AQUEOUS GEL-CASTING**
  Author(s): Navarro, M. E.; Capdevila, X. G.; Morales, M.; *et al.* **Source:** JOURNAL OF POWER SOURCES **Volume:** 200 **Pages:** 45-52 **DOI:** 10.1016/j.jpowsour.2011.10.059 **Published:** FEB 15 2012

- **Title: OXYGENATION KINETICS OF YBCO-TSMG SAMPLES USING THE NANOINDENTATION TECHNIQUE**
  Author(s): Roa, J. J.; Dias, F. T.; Martinez, M.; *et al.* **Source:** JOURNAL OF THE EUROPEAN CERAMIC SOCIETY **Volume:** 32 **Issue:** 2 **Pages:** 425-431 **DOI:** 10.1016/j.jeurceramsoc.2011.09.013 **Published:** FEB 2012

- **Title: MECHANICAL PROPERTIES OF HIGHLY TEXTURED POROUS Ni-YSZ AND Co-YSZ CERMETS PRODUCED FROM DIRECTIONALLY SOLIDIFIED EUTECTICS**
  Author(s): Roa, J. J.; Laguna-Bercero, M. A.; Larrea, A.; *et al.* **Source:** CERAMICS INTERNATIONAL **Volume:** 37 **Issue:** 8 **Pages:** 3123-3131 **DOI:** 10.1016/j.ceramint.2011.05.051 **Published:**

DEC 2011

- **Title: HYDROTHERMAL ASSISTED SYNTHESIS OF IRON OXIDE-BASED MAGNETIC SILICA SPHERES AND THEIR PERFORMANCE IN MAGNETOPHORETIC WATER PURIFICATION**
  Author(s): Caparros, C.; Benelmekki, M.; Martins, P. M.; *et al.* **Source:** MATERIALS CHEMISTRY AND PHYSICS **Volume:** 135 **Issue:** 2-3 **Pages:** 510-517 **DOI:** 10.1016/j.matchemphys.2012.05.016 **Published:** AUG 15 2012

- **Title: EFFECT OF HOT-FILAMENT ANNEALING IN A HYDROGEN ATMOSPHERE ON THE ELECTRICAL AND STRUCTURAL PROPERTIES OF Nb-DOPED TiO2 SPUTTERED THIN FILMS**
  Author(s): Tavares, C. J.; Castro, M. V.; Marins, E. S.; *et al.* **Source:** THIN SOLID FILMS **Volume:** 520 **Issue:** 7 **Pages:** 2514-2519 **DOI:** 10.1016/j.tsf.2011.10.031 **Published:** JAN 31 2012

- **Title: STRUCTURE AND PROPERTIES OF SILVER CLUSTERS IMPLANTED IN PET BY PVD SPUTTERING FOR ACTIVE PACKAGING APPLICATIONS**
  Author(s): Benelmekki, M.; Torrell, M.; Xuriguera, E.; *et al.* **Source:** JOURNAL OF NANO RESEARCH **Volume:** 18-19 **Pages:** 105-116 **DOI:** 10.4028/ www.scientific.net/ JNanoR.18-19.105 **Published:** 2012

- **Title: DESIGN AND CHARACTERIZATION OF Ni2+ AND Co2+ DECORATED POROUS MAGNETIC SILICA SPHERES SYNTHESIZED BY HYDROTHERMAL-ASSISTED MODIFIED-STOBER METHOD FOR HIS-TAGGED PROTEINS SEPARATION**
  Author(s): Benelmekki, M.; Xuriguera, E.; Caparros, C.; *et al.* **Source:** JOURNAL OF COLLOID AND INTERFACE SCIENCE **Volume:** 365 **Issue:** 1 **Pages:** 156-162 **DOI:** 10.1016/j.jcis.2011.09.051 **Published:** JAN 1 2012

- **Title: VIBRATIONAL PROPERTIES OF STANNITE AND KESTERITE TYPE COMPOUNDS: RAMAN SCATTERING ANALYSIS OF Cu-2(Fe,Zn)SnS4**
  Author(s): Fontane, X.; Izquierdo-Roca, V.; Saucedo, E.; *et al.* **Source:** JOURNAL OF ALLOYS AND COMPOUNDS**Volume:** 539 **Pages:** 190-194 **DOI:** 10.1016/j.jallcom.2012.06.042 **Published:** OCT 25 2012

- **Title: SOLUTION-GROWTH AND OPTOELECTRONIC PERFORMANCE OF ZnO:Cl/ TiO2 AND ZnO:Cl/ZnxTiOy/TiO2 CORE-SHELL NANOWIRES WITH TUNABLE SHELL THICKNESS**
  Author(s): Fan, Jiandong; Zamani, Reza; Fabrega, Cristian; *et al.* **Source:** JOURNAL OF PHYSICS D-APPLIED PHYSICS **Volume:** 45 **Issue:** 41 **Article Number:** 415301 **DOI:** 10.1088/0022-3727/45/41/415301 **Published:** OCT 17 2012

- **Title: SOLUTION-GROWTH AND OPTOELECTRONIC PERFORMANCE OF ZnO:Cl/ TiO2 AND ZnO:Cl/ZnxTiOy/TiO2 CORE-SHELL NANOWIRES WITH TUNABLE SHELL THICKNESS**
  Author(s): Fan, Jiandong; Zamani, Reza; Fabrega, Cristian; *et al.* **Source:** JOURNAL OF PHYSICS D-APPLIED PHYSICS **Volume:** 45 **Issue:** 41 **Article Number:** 415301 **DOI:** 10.1088/0022-3727/45/41/415301 **Published:** OCT 17 2012

- **Title: VISIBLE PHOTOLUMINESCENCE COMPONENTS OF SOLUTION-GROWN ZnO NANOWIRES: INFLUENCE OF THE SURFACE DEPLETION LAYER**
  Author(s): Fan, Jiandong; Gueell, Frank; Fabrega, Cristian; *et al.* **Source:** JOURNAL OF PHYSICAL CHEMISTRY C **Volume:** 116 **Issue:** 36 **Pages:** 19496-19502 **DOI:** 10.1021/jp302443n **Published:** SEP 13 2012

- **Title: SYNTHESIS OF CERIA-ZIRCONIA NANOCRYSTALS WITH IMPROVED MICROSTRUCTURAL HOMOGENEITY AND OXYGEN STORAGE CAPACITY BY HYDROLYTIC SOL-GEL PROCESS IN COORDINATING ENVIRONMENT**
  Author(s): Epifani, Mauro; Andreu, Teresa; Abdollahzadeh-Ghom, Sara; *et al.* **Source:** ADVANCED FUNCTIONAL MATERIALS **Volume:** 22 **Issue:** 13 **Pages:** 2867-2875 **DOI:** 10.1002/adfm.201200380 **Published:** JUL 10 2012

- **Title: SURFACE MODIFICATION OF METAL OXIDE NANOCRYSTALS FOR IMPROVED SUPERCAPACITORS**
  Author(s): Epifani, Mauro; Chavez-Capilla, Teresa; Andreu, Teresa; *et al.* **Source:** ENERGY & ENVIRONMENTAL SCIENCE **Volume:** 5 **Issue:** 6 **Pages:** 7555-7558 **DOI:** 10.1039/c2ee00013j **Published:** JUN 2012

- **Title: CATALYST SIZE LIMITATION IN VAPOR-LIQUID-SOLID ZnO NANOWIRE GROWTH USING PULSED LASER DEPOSITION**
  Author(s): Marcu, A.; Trupina, L.; Zamani, R.; *et al.* **Source:** THIN SOLID FILMS **Volume:** 520 **Issue:** 14 **Special Issue:** SI **Pages:** 4626-4631 **DOI:** 10.1016/j.tsf.2011.10.126 **Published:** MAY 1 2012

- **Title: SELF-ASSEMBLED GaN NANOWIRES ON DIAMOND**
  Author(s): Schuster, Fabian; Furtmayr, Florian; Zamani, Reza; *et al.* **Source:** NANO LETTERS **Volume:** 12 **Issue:** 5 **Pages:** 2199-2204 **DOI:** 10.1021/nl203872q **Published:** MAY 2012

- **Title: POLARITY ASSIGNMENT IN ZnTe, GaAs, ZnO, AND GaN-AlN NANOWIRES FROM DIRECT DUMBBELL ANALYSIS**
  Author(s): de la Mata, Maria; Magen, Cesar; Gazquez, Jaume; *et al.* **Source:** NANO LETTERS **Volume:** 12 **Issue:** 5 **Pages:** 2579-2586 **DOI:** 10.1021/nl300840q **Published:** MAY 2012

- **Title: ACTIVE NANO-CuPt3 ELECTROCATALYST SUPPORTED ON GRAPHENE FOR ENHANCING REACTIONS AT THE CATHODE IN ALL-VANADIUM REDOX FLOW BATTERIES**
  Author(s): Flox, Cristina; Rubio-Garcia, Javier; Nafria, Raquel; *et al.* **Source:** CARBON **Volume:** 50 **Issue:** 6 **Pages:** 2372-2374 **DOI:** 10.1016/j.carbon.2012.01.060 **Published:** MAY 2012

- **Title: Cu2ZnGeSe4 NANOCRYSTALS: SYNTHESIS AND THERMOELECTRIC PROPERTIES**
  Author(s): Ibanez, Maria; Zamani, Reza; LaLonde, Aaron; *et al.* **Source:** JOURNAL OF THE AMERICAN CHEMICAL SOCIETY **Volume:** 134 **Issue:** 9 **Pages:** 4060-4063 **DOI:** 10.1021/ja211952z **Published:** MAR 7 2012

- **Title: EXTENDING THE NANOCRYSTAL SYNTHESIS CONTROL TO QUATERNARY COMPOSITIONS**

Author(s): Ibanez, Maria; Zamani, Reza; Li, Wenhua; *et al.* **Source:** CRYSTAL GROWTH & DESIGN **Volume:** 12 **Issue:** 3 **Pages:** 1085-1090 **DOI:** 10.1021/cg201709c **Published:** MAR 2012

- **Title: COMPOSITION CONTROL AND THERMOELECTRIC PROPERTIES OF QUATERNARY CHALCOGENIDE NANOCRYSTALS: THE CASE OF STANNITE Cu2CdSnSe4**
  Author(s): Ibanez, Maria; Cadavid, Doris; Zamani, Reza; *et al.* **Source:** CHEMISTRY OF MATERIALS **Volume:** 24 **Issue:** 3 **Pages:** 562-570 **DOI:** 10.1021/cm2031812 **Published:** FEB 14 2012

- **Title: TAILORED GRAPHENE MATERIALS BY CHEMICAL REDUCTION OF GRAPHENE OXIDES OF DIFFERENT ATOMIC STRUCTURE**
  Author(s): Botas, Cristina; Alvarez, Patricia; Blanco, Clara; *et al.* **Source:** RSC ADVANCES **Volume:** 2 **Issue:** 25 **Pages:** 9643-9650 **DOI:** 10.1039/c2ra21447d **Published:** 2012

- **Title: SELF-ASSEMBLED GaN QUANTUM WIRES ON GaN/AlN NANOWIRE TEMPLATES**
  Author(s): Arbiol, Jordi; Magen, Cesar; Becker, Pascal; *et al.* **Source:** NANOSCALE **Volume:** 4 **Issue:** 23 **Pages:** 7517-7524 **DOI:** 10.1039/c2nr32173d **Published:** 2012

- **Title: Pt DOPING TRIGGERS GROWTH OF TiO2 NANORODS: NANOCOMPOSITE SYNTHESIS AND GAS-SENSING PROPERTIES**
  Author(s): Epifani, Mauro; Andreu, Teresa; Zamani, Reza; *et al.* **Source:** CRYSTENGCOMM **Volume:** 14 **Issue:** 11 **Pages:** 3882-3887 **DOI:** 10.1039/c2ce06690d **Published:** 2012

- **Title: SUPPRESSION OF THREE DIMENSIONAL TWINNING FOR A 100% YIELD OF VERTICAL GaAs NANOWIRES ON SILICON**
  Author(s): Russo-Averchi, Eleonora; Heiss, Martin; Michelet, Lionel; *et al.* **Source:** NANOSCALE **Volume:** 4 **Issue:** 5 **Pages:** 1486-1490 **DOI:** 10.1039/c2nr11799a **Published:** 2012

- **Title: RETRIEVING THE SPATIAL DISTRIBUTION OF CAVITY MODES IN DIELECTRIC RESONATORS BY NEAR-FIELD IMAGING AND ELECTRODYNAMICS SIMULATIONS**
  Author(s): Goni, Alejandro R.; Güell, Frank; Perez, Luis A.; *et al.* **Source:** NANOSCALE **Volume:** 4 **Issue:** 5 **Pages:** 1620-1626 **DOI:** 10.1039/c2nr11693f **Published:** 2012

- **Title: ENHANCEMENT OF THE PHOTOELECTROCHEMICAL PROPERTIES OF Cl-DOPED ZnO NANOWIRES BY TUNING THEIR COAXIAL DOPING PROFILE**
  Author(s): Fan, Jiandong; Güell, Frank; Fabrega, Cristian; *et al.* **Source:** APPLIED PHYSICS LETTERS **Volume:** 99 **Issue:** 26 **Article Number:** 262102 **DOI:** 10.1063/1.3673287 **Published:** DEC 26 2011

- **Title: ROLE OF Ga2O3-In2O3-ZnO CHANNEL COMPOSITION ON THE ELECTRICAL PERFORMANCE OF THIN-FILM TRANSISTORS**
  Author(s): Olziersky, A.; Barquinha, P.; Vila, A.; *et al.* **Source:** MATERIALS CHEMISTRY AND PHYSICS **Volume:** 131 **Issue:** 1-2 **Pages:** 512-518 **DOI:** 10.1016/j.matchemphys.2011.10.013 **Published:** DEC 15 2011

- **Title: MULTICOMPONENT OXIDE THIN-FILM TRANSISTORS FABRICATED BY A DOUBLE-LAYER INKJET PRINTING PROCESS**
  Author(s): Olziersky, Antonis; Vila, Anna; Morante, Juan Ramon **Conference:** Symposium on Transparent Conductive Materials (TCM) **Location:** Hersonissos, GREECE **Date:** OCT 17-21,

2010 **Source:** THIN SOLID FILMS **Volume:** 520 **Issue:** 4 **Pages:** 1334-1340 **DOI:** 10.1016/j.tsf.2011.04.149 **Published:** DEC 1 2011

- **Title: TWO STEP, HYDROLYTIC-SOLVOTHERMAL SYNTHESIS OF REDISPERSIBLE TITANIA NANOCRYSTALS AND THEIR GAS-SENSING PROPERTIES**
  Author(s): Epifani, Mauro; Comini, Elisabetta; Faglia, Guido; *et al.* **Source:** JOURNAL OF SOL-GEL SCIENCE AND TECHNOLOGY **Volume:** 60 **Issue:** 3 **Pages:** 254-259 **DOI:** 10.1007/s10971-011-2485-9 **Published:** DEC 2011

- **Title: CARRIER CONFINEMENT IN GaN/AlxGa1-xN NANOWIRE HETEROSTRUCTURES (0 < X <= 1)**
  Author(s): Furtmayr, Florian; Teubert, Joerg; Becker, Pascal; *et al.* **Source:** PHYSICAL REVIEW B **Volume:** 84 **Issue:** 20 **Article Number:** 205303 **DOI:** 10.1103/PhysRevB.84.205303 **Published:** NOV 10 2011

- **Title: LOW DARK COUNT GEIGER MODE AVALANCHE PHOTODIODES FABRICATED IN CONVENTIONAL CMOS TECHNOLOGIES**
  Author(s): Vilella, E.; Arbat, A.; Alonso, O.; *et al.* **Source:** SENSOR LETTERS **Volume:** 9 **Issue:** 6 **Special Issue:** SI **Pages:** 2408-2411 **DOI:** 10.1166/sl.2011.1814 **Published:** DEC 2011

- **Title: CHARACTERIZATION AND SIMULATION OF AVALANCHE PHOTODIODES FOR NEXT-GENERATION COLLIDERS**
  Author(s): Vila, A.; Trenado, J.; Arbat, A.; *et al.* **Source:** SENSORS AND ACTUATORS A-PHYSICAL **Volume:** 172 **Issue:** 1 **Special Issue:** SI **Pages:** 181-188 **DOI:** 10.1016/j.sna.2011.05.011 **Published:** DEC 2011

- **Title: RAMAN SCATTERING INVESTIGATION OF MnxFe1-xIn2S4 SOLID SOLUTIONS**
  Author(s): Guc, M.; Ursaki, V. V.; Bodnar, I. V.; *et al.* **Source:** MATERIALS CHEMISTRY AND PHYSICS **Volume:** 136 **Issue:** 2-3 **Pages:** 883-888 **DOI:** 10.1016/j.matchemphys.2012.07.061 **Published:** OCT 15 2012

- **Title: DEVELOPMENT OF A SELECTIVE CHEMICAL ETCH TO IMPROVE THE CONVERSION EFFICIENCY OF Zn-RICH Cu2ZnSnS4 SOLAR CELLS**
  Author(s): Fairbrother, Andrew; Garcia-Hemme, Eric; Izquierdo-Roca, Victor; *et al.* **Source:** JOURNAL OF THE AMERICAN CHEMICAL SOCIETY **Volume:** 134 **Issue:** 19 **Pages:** 8018-8021 **DOI:** 10.1021/ja301373e **Published:** MAY 16 2012

- **Title: RAMAN ANALYSIS OF MONOCLINIC Cu2SnS3 THIN FILMS**
  Author(s): Berg, Dominik M.; Djemour, Rabie; Guetay, Levent; *et al.* **Source:** APPLIED PHYSICS LETTERS **Volume:** 100 **Issue:** 19 **Article Number:** 192103 **DOI:** 10.1063/1.4712623 **Published:** MAY 7 2012

- **Title: ELECTRICAL AND OPTICAL PROPERTIES OF Zn-In-Sn-O TRANSPARENT CONDUCTING THIN FILMS**
  Author(s): Carreras, Paz; Antony, Aldrin; Rojas, Fredy; *et al.* **Conference:** Symposium on Transparent Conductive Materials (TCM) **Location:** Hersonissos, GREECE **Date:** OCT 17-21, 2010 **Source:** THIN SOLID FILMS **Volume:** 520 **Issue:** 4 **Pages:** 1223-1227 **DOI:** 10.1016/j.tsf.2011.06.078 **Published:** DEC 1 2011

- **Title: RESISTANCE SWITCHING IN TRANSPARENT MAGNETIC MGO FILMS**
  Author(s): Jambois, O.; Carreras, P.; Antony, A.; *et al.* **Source:** SOLID STATE COMMUNICATIONS **Volume:** 151 **Issue:** 24 **Pages:** 1856-1859 **DOI:** 10.1016/j.ssc.2011.10.009 **Published:** DEC 2011

- **Title: HYDROGEN PRODUCTION FROM OXIDATIVE STEAM-REFORMING OF N-PROPANOL OVER Ni/Y2O3-ZrO2 CATALYSTS**
  Author(s): Yerman, Luis; Homs, Narcis; Ramirez de la Piscina, Pilar **Source:** INTERNATIONAL JOURNAL OF HYDROGEN ENERGY**Volume:** 37 **Issue:** 8 **Pages:** 7094-7100 **DOI:** 10.1016/j.ijhydene.2011.11.045 **Published:** APR 2012

- **Title: HYDROGEN PRODUCTION FROM THE STEAM REFORMING OF BIO-BUTANOL OVER NOVEL SUPPORTED Co-BASED BIMETALLIC CATALYSTS**
  Author(s): Cai, Weijie; Ramirez de la Piscina, Pilar; Homs, Narcis **Source:** BIORESOURCE TECHNOLOGY **Volume:** 107 **Pages:** 482-486 **DOI:** 10.1016/j.biortech.2011.12.081 **Published:** MAR 2012

- **Title: EFFICIENT HYDROGEN PRODUCTION FROM BIO-BUTANOL OXIDATIVE STEAM REFORMING OVER BIMETALLIC Co-Ir/ZnO CATALYSTS**
  Author(s): Cai, Weijie; Homs, Narcis; Ramirez de la Piscina, Pilar **Source:** GREEN CHEMISTRY **Volume:** 14 **Issue:** 4 **Pages:** 1035-1043 **DOI:** 10.1039/c2gc16369a **Published:** 2012

APPENDIX 3

LIST OF PATENTS

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Authors: Frigeri, P.A.; Nos, O.; Bertomeu, J.
Title: **Aparato y método para depósito químico en fase vapor con hilo caliente**
2011

Authors: Bertran, E.; Aguiló, N.; Inestrosa, M.J.
Title: **Método y reactor para la producción de nanopartículas recubiertas de carbono**
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Authors: Esteve Tintó, J.; Acero Leal, M.C.; Fondevilla Sala, N.; Pérez Rodríguez, A.; Serre, C.
Title: **Device for generating electric power from small movements**
2012

Authors: Estrade, S.; Portillo, J.; Peiro, F.; Rebled, J.M.; Yedra, Ll.; Nicolopoulos, S.; Kim, S.; Weiss, J.K.
Title: **Method and system for improving characteristic peak signals in analytical electron microscopy**
2012

Authors: Alcalde, E.; Díaz, J.L.; Mesquida, N.; Paloma, L.
Title: **Imidazo[2,1-b]thiazole derivatives, their preparation and use as medicaments**
2012

Authors: Alcalde, E.; Almansa, C.; Díaz, J.L.; Mesquida, N.; Paloma, L.
Title: **New indene derivatives, their preparation ans use as medicaments**
2012

Authors: Alcalde, E.; Mesquida, N.; Paloma, L
Title: **Derivados de dihidroindeno, su preparación y su uso como medicamentos**
2012

APPENDIX 4

LIST OF MEMBERS

LIST OF MEMBERS

ALBALAT PIÑOL, ROSA
ALCALDE PAIS, M. ERMITAS
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ARRO PLANS, MONTSERRAT
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CALVO BARRIO, LORENZO
CANILLAS BIOSCA, ADOLFO
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CASTAN VIDAL, MARIA TERESA
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CORBELLA CORDOMI, MONTSERRAT
CORNET CALVERAS, ALBERT
CORVERA POIRÉ, EUGENIA
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DIAZ LUCEA, M. PILAR
DIEZ PEREZ, ISMAEL
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DOMENECH CABRERA, OSCAR
EGEA GRAS, M. ANTONIA
EGEA GURI, GUSTAVO
EL FALLAH , MOHAMED SALAH
ESCRIBANO FERRER, ELVIRA
ESCUER FITE, ALBERTO
ESPINA GARCIA, MARTA
ESTELRICH LATRAS, JOAN
ESTEVE PUJOL, JOAN
ESTRADE ALBIOL, SONIA
FARRE VENTURA, RAMON
FARRERA PIÑOL, JOAN ANTONI
FERNANDEZ BUSQUETS, XAVIER
FERNANDEZ PRADAS, JUAN MARCOS
FERNANDEZ TIBURCIO, ANTONIO
FERRATER MARTORELL, CESAR
FIGUEROLA SILVESTRE, ALBERT
FONDEVILLA SALA, NURIA
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FRANZESE , GIANCARLO
GALLARDO ROMAN, OSCAR
GALLARDO SAURET, MONTSERRAT
GAMISANS LINARES, FIDENCIA
GARCIA CAPDEVILA, JAVIER
GARCIA CELMA, MARIA JOSE
GARCIA CESPEDES, JORDI
GARCIA DEL MURO SOLANS, MONTSERRAT

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GOMEZ VALENTIN, ELVIRA
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GORDO VILLOSLADA, SUSANA
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MAYOL SANCHEZ, RICARDO
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MAÑOSAS CASTEJON, MARIA
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MONTERO BARRIENTOS, M. TERESA
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MORANTE LLEONART, JOAN RAMON
MORENZA GIL, JOSE LUIS
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MULLER JEVENOIS, CARLOS MARIA
MULLER JEVENOIS, GUILLERMO
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MUÑOZ JUNCOSA, M. MONTSERRAT
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OLIVA HERRERA, MIREIA
ONCINS MARCO, GERARD
ORTIN RULL, JORDI
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PASCUAL MIRALLES, ESTHER
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RIBAS GISPERT, JUAN
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SERRE, CHRISTOPHE
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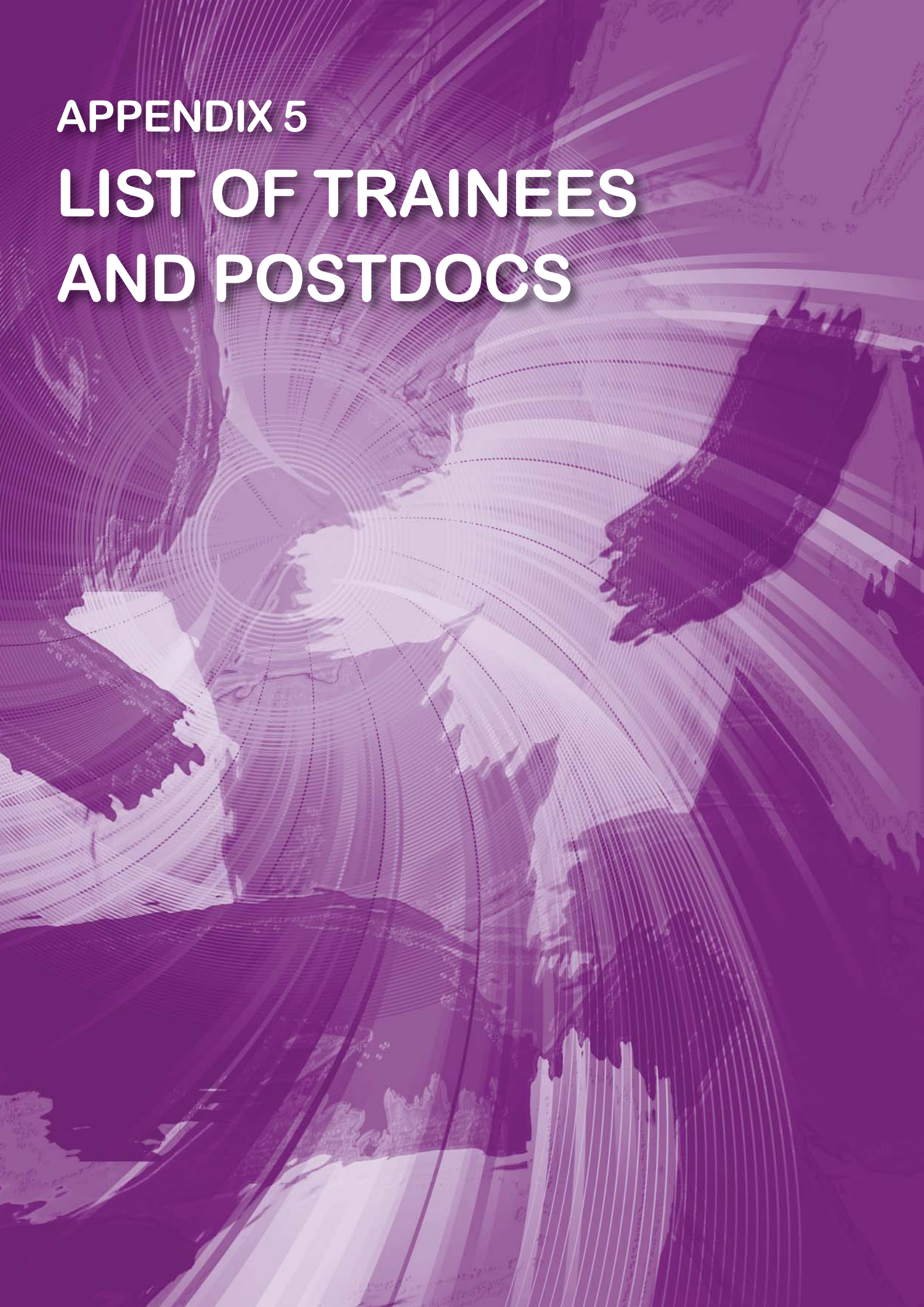
VILADOMAT MEYA, FRANCISCO
VIVES SANTA-EULALIA, EDUARD
WERONSKI , KONRAD JANUSZ
XURIGUERA MARTIN, M. ELENA



APPENDIX 5

LIST OF TRAINEES AND POSTDOCS

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ALEMANY ARIAS, ANNA
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CARRERAS SEGUÍ, PAZ
CLARAMUNT RUIZ, SERGI
CORTES FRANCISCO, MERITXELL
CRAIG, GAVIN
ELJARRAT ASCUNCE, ALBERTO
FERNÁNDEZ MARTÍNEZ, ANTONIO
FRIGERI, PAOLO
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IBAÑEZ JIMENEZ, ANNA
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LLUSCA JANE, MARTA
LOPEZ CONESA, LUIS
LORENZO ROS, SARA
LÓPEZ VIDRIER, JULIÀ
MARTI PRIETO, MARIA
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MONTANYA TANYA, NURIA
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MOYA ALVAREZ, CARLOS
NOS AGUILA, ORIOL
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PETIT GARRIDO, NURIA
POU RAURELL, ARNAU
PULIDO COMPANYS, ALBA
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REBLED CORSELLAS, JOSE MANUEL
REY SERRA, BLANCA
RODRIGUEZ ABRIL, SONIA
ROIG ROIG, FERRAN
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