ACTIVITY REPORT 2010 2011

Institut de Nanociència i Nanotecnologia de la Universitat de Barcelona

IN2UB Institut de Nanociència i Nanotecnologia
B:KC Barcelona Knowledge Campus
UB Universitat de Barcelona

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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.

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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 described in three different areas:

1. **Semiconductor Nanostructures:** the group has studied both the fundamental state as well as the infrared response of three concentric quantic rings by means of local spin approach.

2. **Bose-Einstein Condensates:** the group has studied the Josephson Effect, which may occur upon appearance of self-induced barriers after introducing dipolar interactions between atoms.

3. **Quantum Fluids:** research has been done, on the one hand, on the real-time evolution of a bubble generated by the excited state of an electron within liquid helium and, on the other hand, a density functional has been developed in order to describe the properties of parahydrogen molecules in the liquid state.

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.

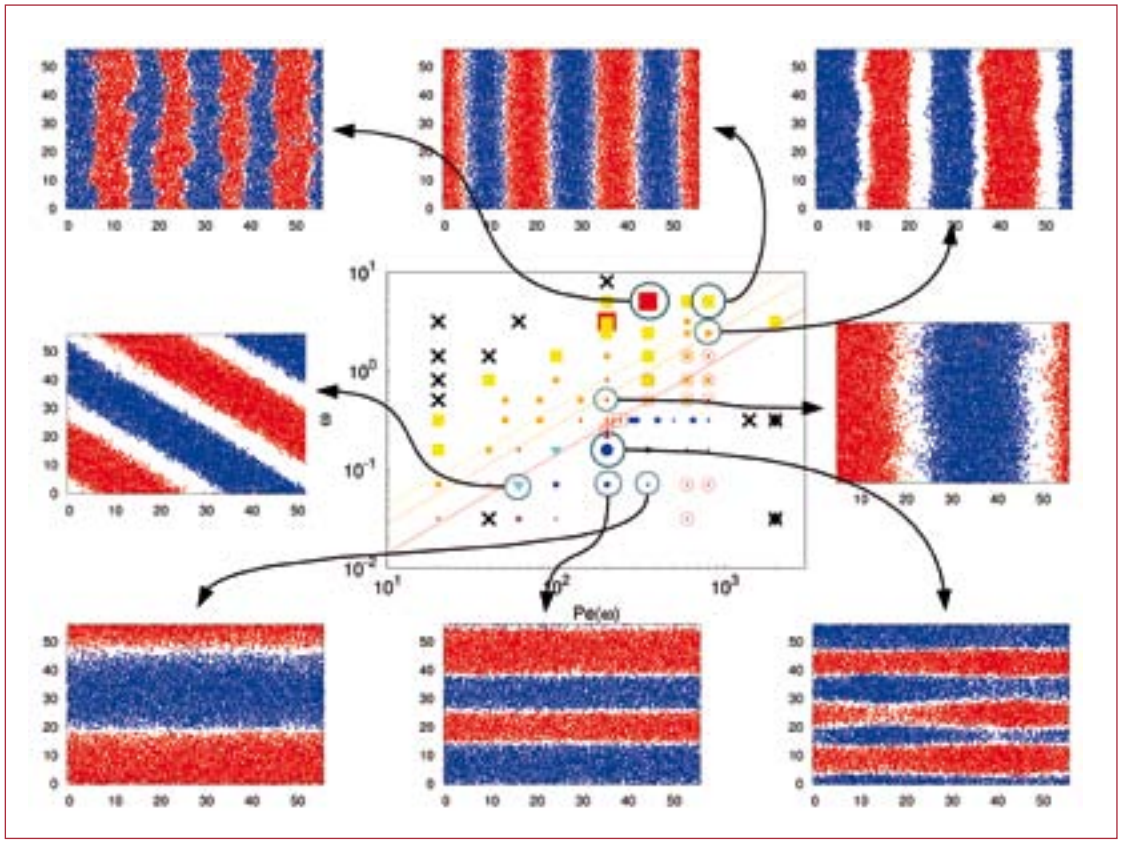
2. It has been shown that thermodynamic quantities such as temperature cannot be defined consistently enough at very short length scales, and a lower limit for a thermodynamic description has been established.

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



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.

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.

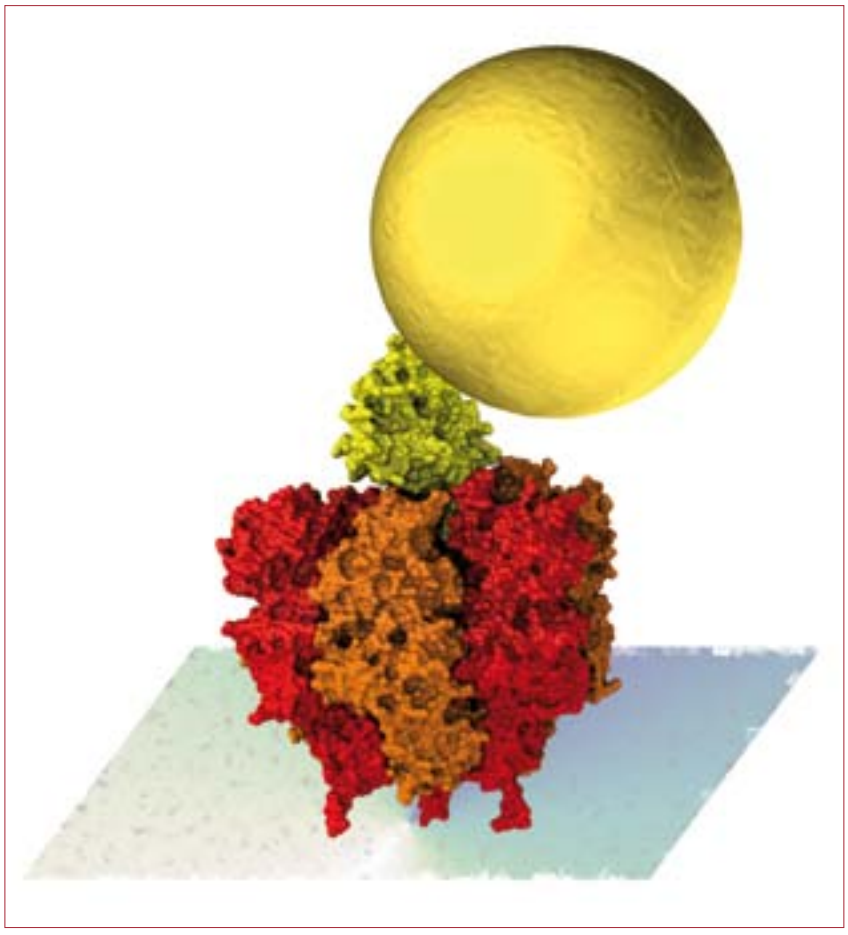
8. The structures induced by an oscillating field on charged nanocolloidal mixtures have been considered. The group researchers have shown that the interaction of colloids through the solvent affect the relative stability of segregated structures and have a direct impact in how the forcing external field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

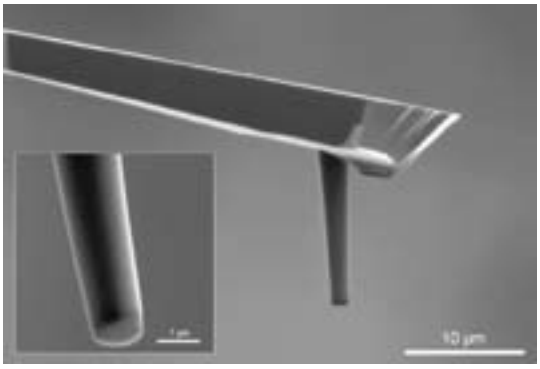
As far as the biophysics area is concerned, outstanding results have been obtained in some relevant subjects, such as the study of the molecular motor F1-ATP dynamics, theoretical modeling based on stochastic, differential equations, and the comparison between the theoretical and the experimental results. 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.



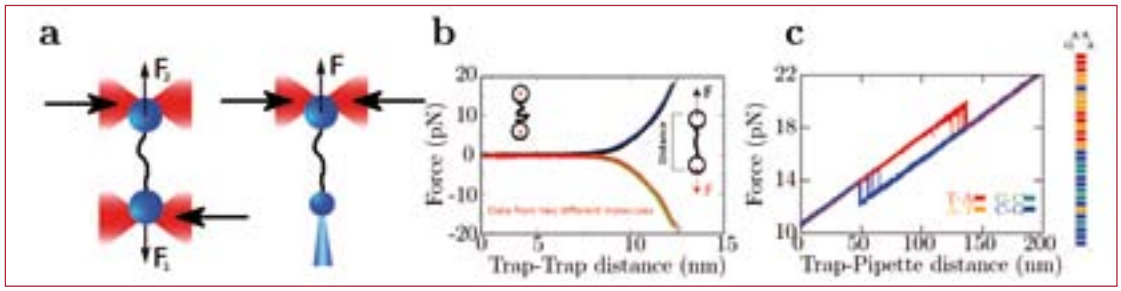
F1-ATPase Molecular motor with a sphere coupled to its axis, in order to observe its rotational movement.

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.

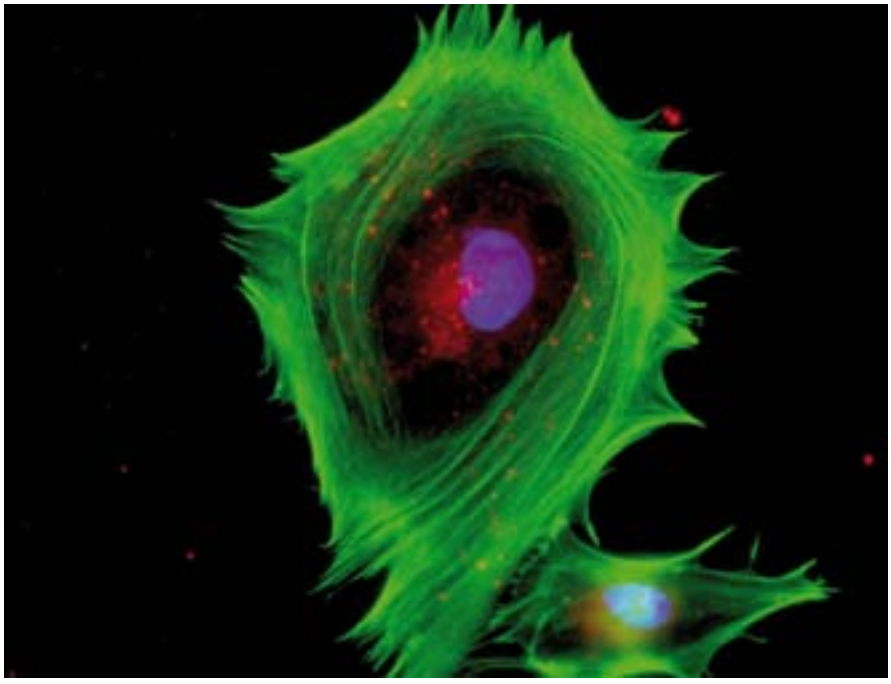
The researchers working at the **Small Biosystems Lab Group** have studied further DNA and RNA individual molecules. The group has also published several articles on DNA and RNA dynamic spectroscopy of forces and on the energetics of the nucleic acids, as well as on other subjects related to the study 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.

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.

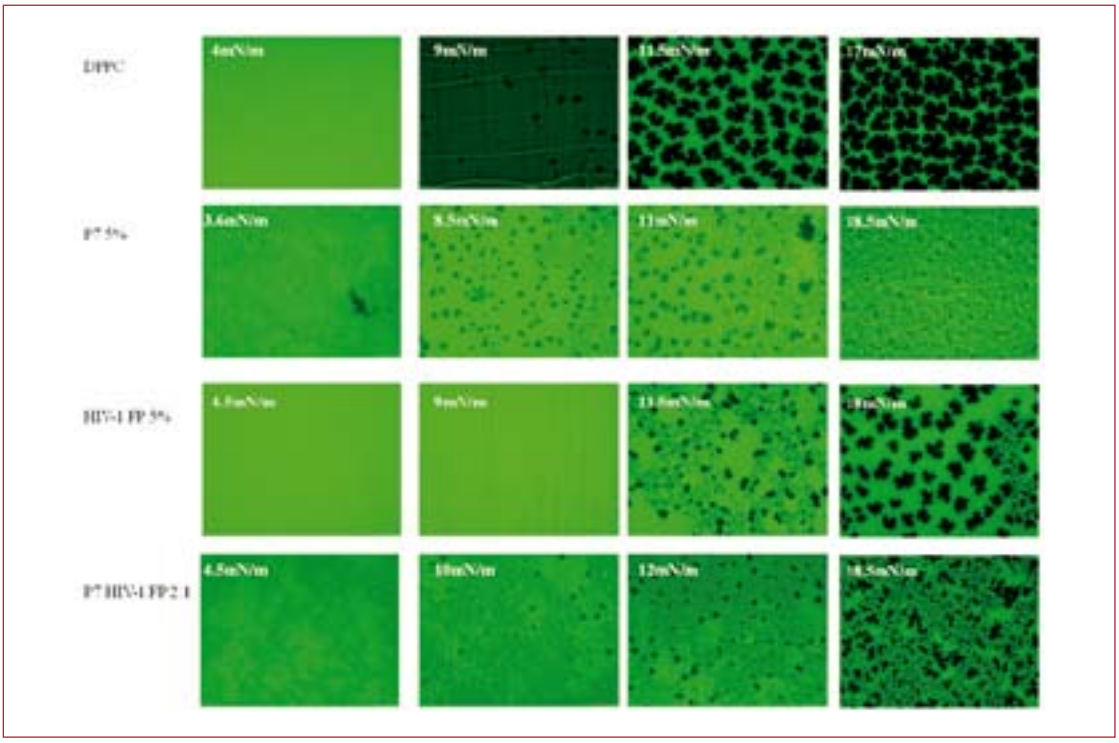
Along the past year, the **Intracellular Compartments and Membrane Trafficking Group** has reported that ethanol activates p190RhoGAP protein in glial cells (Selva et al., JOURNAL OF NEUROCHEMISTRY 2011). This fact explanis why alcohol causes the previously reported actin cytoskeleton rearrangements and cell dysfunctions. It has also been observed that the metabolic pathways that control the synthesis of phospholipid have a relevant role in the secretory membrane trafficking (Sarri et al., JOURNAL OF BIOLOGICAL CHEMISTRY, 2011). The group has also collaborated with Dr. G. Baldini (Arkansas University), the expression of Transcription Factor 6 in relation to the expression of a mutant form of alpha(1)-Antitrypsin Z, which is oftenly found in liver tumors (Smith et al., JOURNAL OF BIOLOGICAL CHEMISTRY, 2011). The group has progressed in the functional study of molecules capable of crossing our established in vitro model of blood-brain barrier.



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 studied the interaction of peptide sequences belonging to the GB virus C with biological model membranes such as lipid monolayers and liposomes. The group's main objective is to learn more about the potential of these peptides in the inhibition of the fusion process caused by the HIV fusion peptide.

On the other hand, the group is working in another research line which focuses on the biophysical and microbiological aspects of polycationic peptides with the aim to overcome the problem of antibiotic resistance.



Epifluorescence images from DPPC monolayers with or without 5% of peptides P7, HIV-1 FP or the combination 2:1 (mol/mol) of P7: HIV-1 FP.

The **Nanobioengineering Group** is a truly multidisciplinary team composed by researchers coming from very diverse backgrounds (chemistry, physics, material science, electronic engineering, pharmacy and molecular biology) and working together in applying 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 functionalisation of materials for the study of biomolecule and cell interactions and for the development of new biosensors that will be 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.

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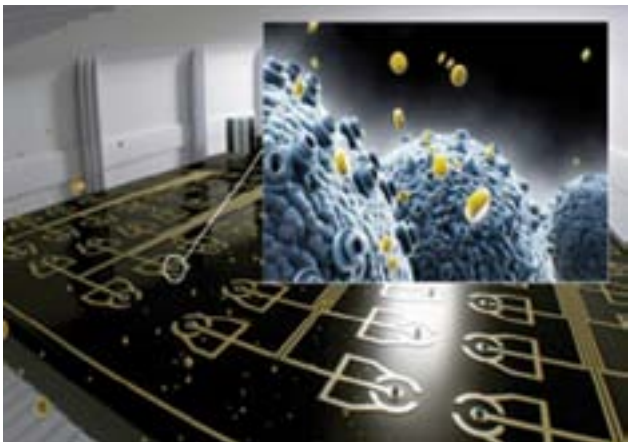
The projects carried out by the group are focused on clinical and industrial problems and are related to four convergent research lines:

1. **Optical and electrochemical biosensors for clinical diagnosis and food safety applications:**
   - DNA sensors for cancer biomarker detection
   - Antibody-based sensors for pathogenic microorganisms' detection
   - Aptamer-based sensors for toxins detection
   - Olfactory receptor-based sensors for odorant and volatile compounds detection
   - Polymer nanowires-based biosensors

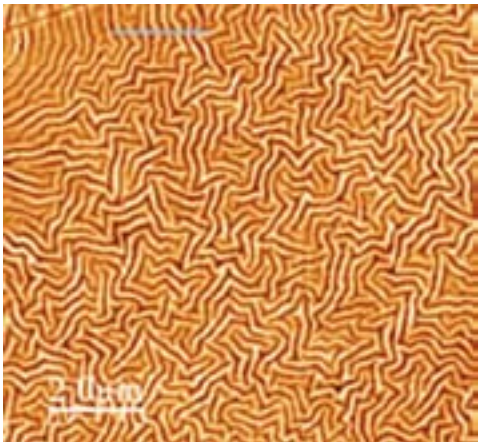
2. **Bio/non-bio interfaces and micro/nanoenvironments for biomedical studies and regenerative medicine applications:**
   - Design, production and characterization of micro/nanoenviroments with different biocompatible materials for cell beha-vior studies (adhesion, proliferation, differentiation)
   - Design, production and characterization of scaffolds with a topography and chemical composition controlled at the nanoscale for ocular and cardiac tissue regenerative therapies based on stem cells

3. **Microfluidic systems for biological studies and lab-on-a-chip devices:**
   - Microfluidic chip for blood/plasma filtering
   - Microfluidic chip using hydrodynamic focusing for bacteria counting and sorting
   - Microfluidic chip for reagent handling in POC diagnosis devices

4. **Nanotechnology applied to biomolecule interaction studies:**
   - Liposome based nanovectors and nanoparticles for drug delivery
   - Magnetic nanoparticles-biomolecules interactions and their applications



Atomic Force Microscopy image of wrinkles on a Polydimethylsiloxane (PDMS) surface, obtained after plasma oxidation and subsequent application of mechanical stress. © Juan Pablo Agusil

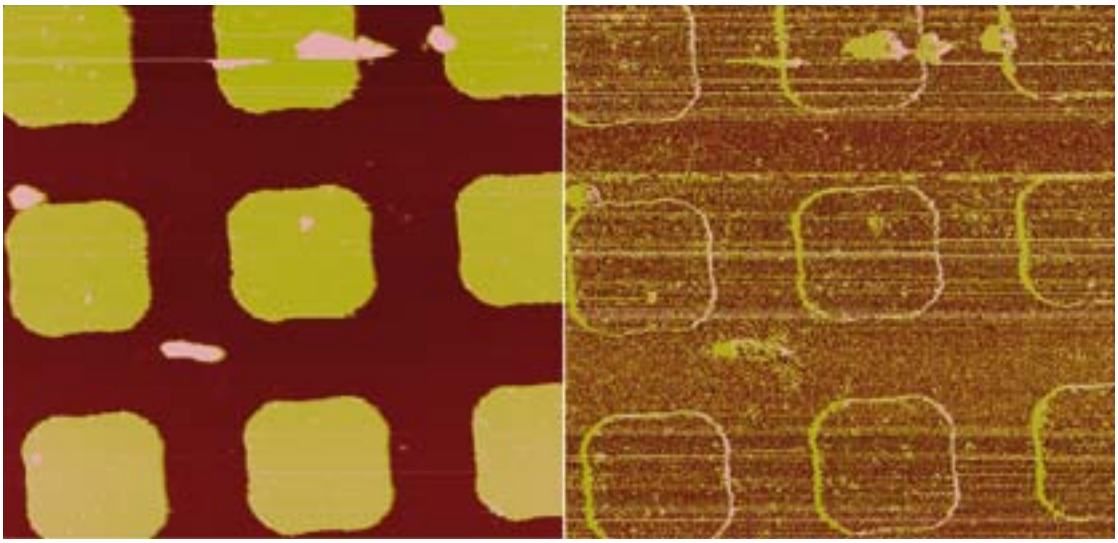


Schematic representation of a biosensor platform for odorant detection based on olfactory receptors. © BOND Project

The **Supramolecular Systems in Nanomedicine Group** has worked on the preparation and characterization of both macrocyclic and open-chain amphiphilic cationic, systems, which have been shown to behave as ionic liquid crystals (LC). Their behaviour as thermotropic LC depends on their topology and on their counter-anion. In particular, the reduced conformational flexibility of the macrocyclic derivatives provides more stability to the mesophases when compared with their open-chain analogues, which may be considered an advantage in order to obtain different types of soft matter, such as vesicles or nanoparticles, something the group is currently exploring. In addition, the thermotropic behaviour of these macrocycles can be modified by changing the counter-ions in the mesophase, a process that can be modulated by anion exchange.

By using the gemini amphiphilic systems, the synthesis of gold nanoparticles (AuNPs) has been achieved. These new surfactants play a triple role since they enable the synthesis and stabilization of the nanoparticles as well as the absorption and release of anionic drugs. Moreover, the new AuNPs have a low in vitro toxicity and are able to penetrate into the cell.

The group has also worked on the preparation of oligophenyl-porphyrin-based metal complexes as components for molecular rotors, and on the biofunctionalisation of gold and polysilicon microparticles by forming self-assembled monolayers (SAMs) in order to analyse intracellular parameters.

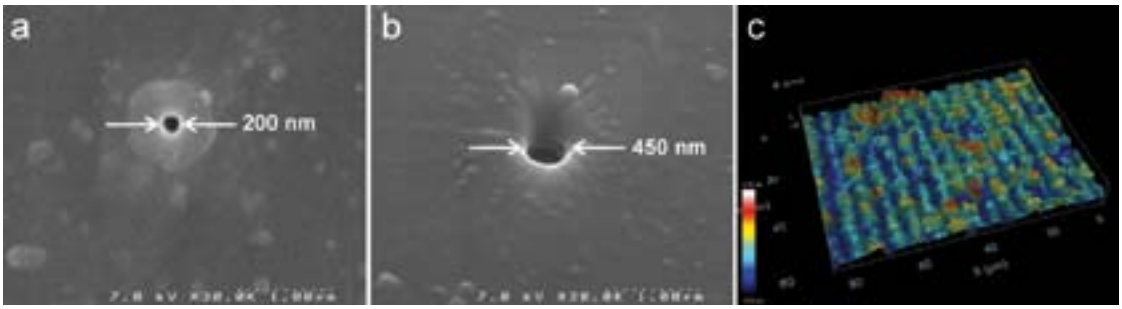


AFM images of a SAM formed on polysilicon.

The **Laser Processing and Biomedical Applications Group**, currently working in the field of laser microfabrication, has mostly focused on two vast research lines:

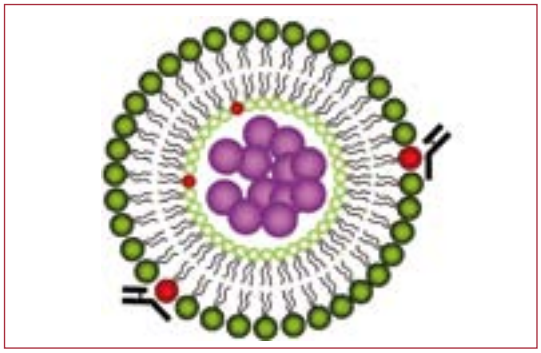
1. A time-resolved imaging study of the mechanism of optical breakdown, cavitation and liquid ejection of the new laser-printing technique developed during the past year.

2. A study of the interaction between the radiation from a femtosecond laser and several transparent materials –mostly polymers–, aimed at producing micropatterns in biomedical applications.

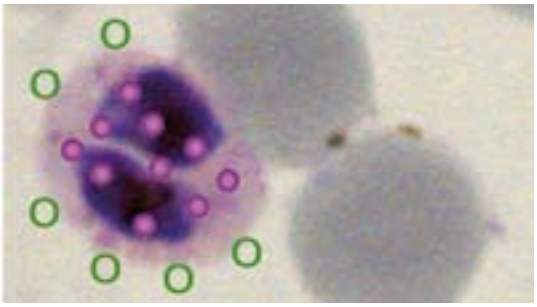


SEM images of nanometrics holes made in PMMA with femtosecond laser (a,b). 3D reconstructed image of the modified surface of UHMWPE with femtosecond laser for bacteria ashesion tests (c).

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.

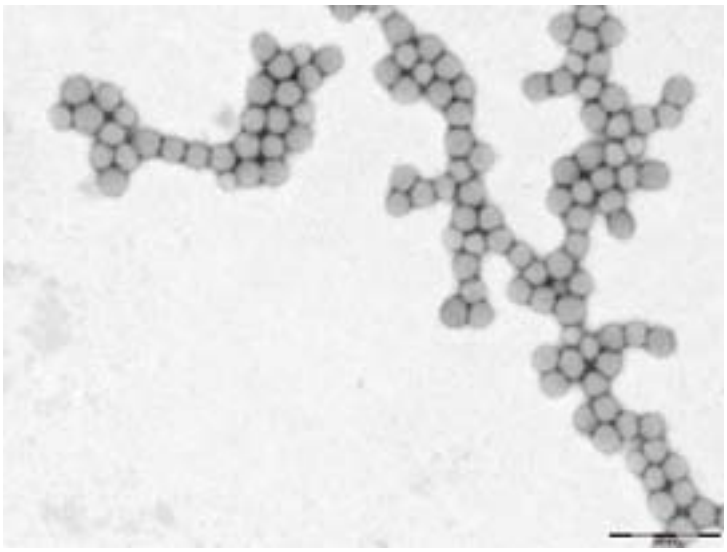


Cartoon of a quantum dot-containing liposoma functionalized with half-antibodies against Plasmodium falciparum-infected red blood cells.



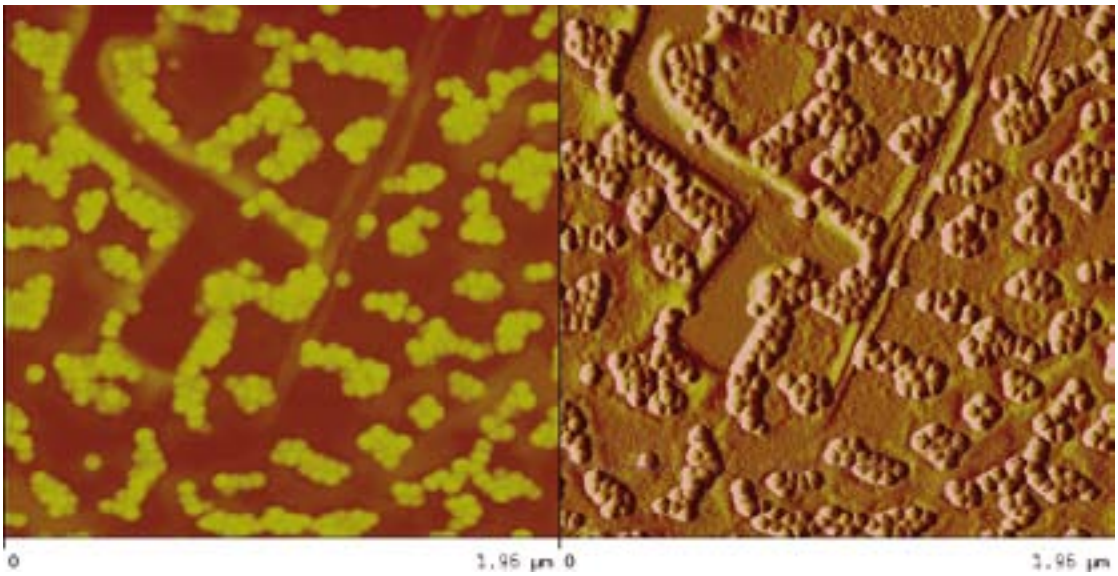
A graphical scheme of the performance of such inmunoliposomal nanovector when added to a P. falciparum culture containing both infected and non-infected cells.

1.3. NANOPHARMACOTHERAPY



TEM image corresponding to Pegylated polyurethane nanoparticles obtained from O/W nano-emulsions.

The **Development of Medicines in Nanostructured Systems Group** has developed functionalized polyurethane and polyurea nanoparticles from nano-emulsions to be used in the vectorisation of drugs and lipidic nanoparticles, aimed at dermal and ocular application in the treatment of inflammatory and neovascular diseases. The group has also been working with new polymeric, both meso- and macroporous materials, obtained from highly-concentrated emulsions as templates. These materials have been designed as implants for controlled drug release. The group is currently exploring the application of self-assembling technologies to the treatment of liver and osteoarticular diseases, as well as the analysis of the lyophilisation and sterilisation processes within nanostructured systems.



Height and phase contrast images of Pegylated polyurethane nanoparticles obtained by AFM in tapping mode.

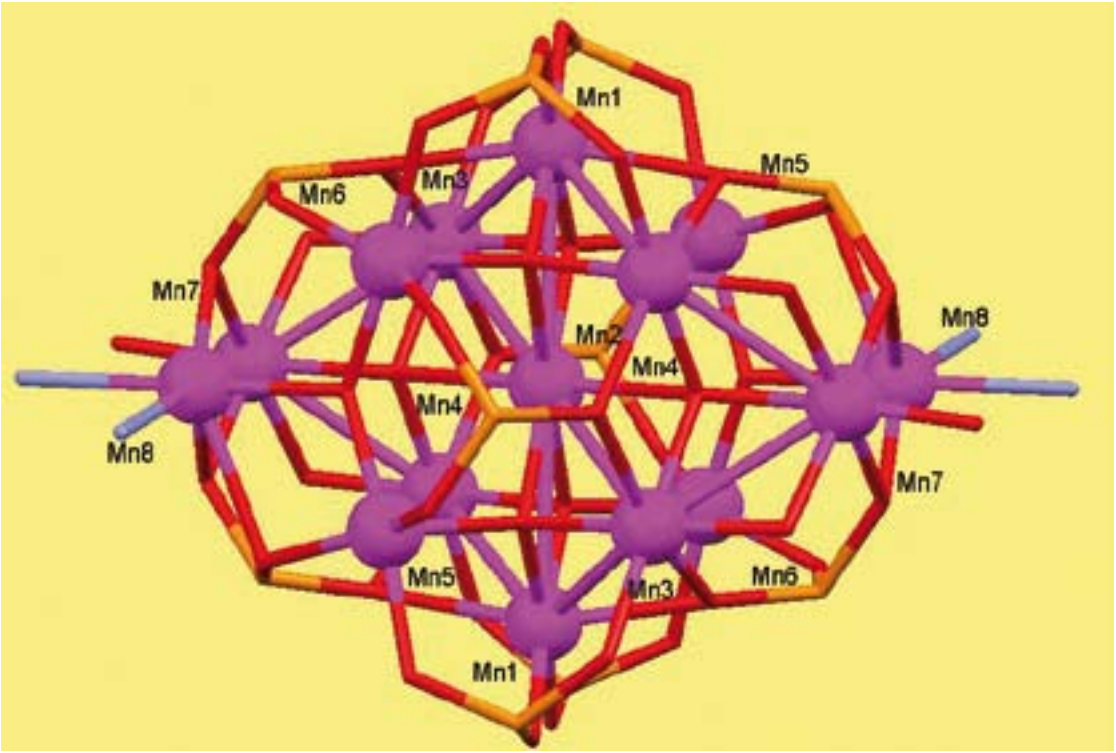
The **Drug Design and Response-evaluation within Pharmaceutical Nanostructured and self-ordered Systems** Group has mainly focused on the in vivo evaluation of polymeric poly lactic-co-glycolic acid nanoparticles (PLGA) containing tricyclic antidepressants. Specifically, the analgesic and anti-allodynic 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 **Colloid Group** has focused on the preparation and characterization of magnetic particles–ferrous biocompatible and biodegradable fluids and magnetoliposomes– with biomedical applications. On the other hand, the group has continued its ongoing work with liposomal systems, which have been used as model-membranes or as nanoscopic systems in the treatment of malaria.

1.4. NANOMAGNETISM, NANOELECTRONICS AND NANOPHOTONICS

The **Magnetic Interactions and Molecular Magnetism Group** has continued the search for new synthetic strategies in the field of nanomagnets. Has prepared new clusters, mainly of Mn (III), for structural characterisation and measurement of their magnetic properties. The ligands used were aldoximes, R and azido-phosphonates (see Inorganic Chemistry, 50, 2717-2722, 2010). The second objective of the research group, polynuclear compounds of general formula [M (N3) 2 (L) 2] n, M = Mn (II) and especially Co (II), to obtain new molecular-based magnets with high Tc or compounds of type magnet chain, SCM, has allowed to prepare several compounds of this type (see Inorganic Chimica Acta, 376 (2011) 23-27).

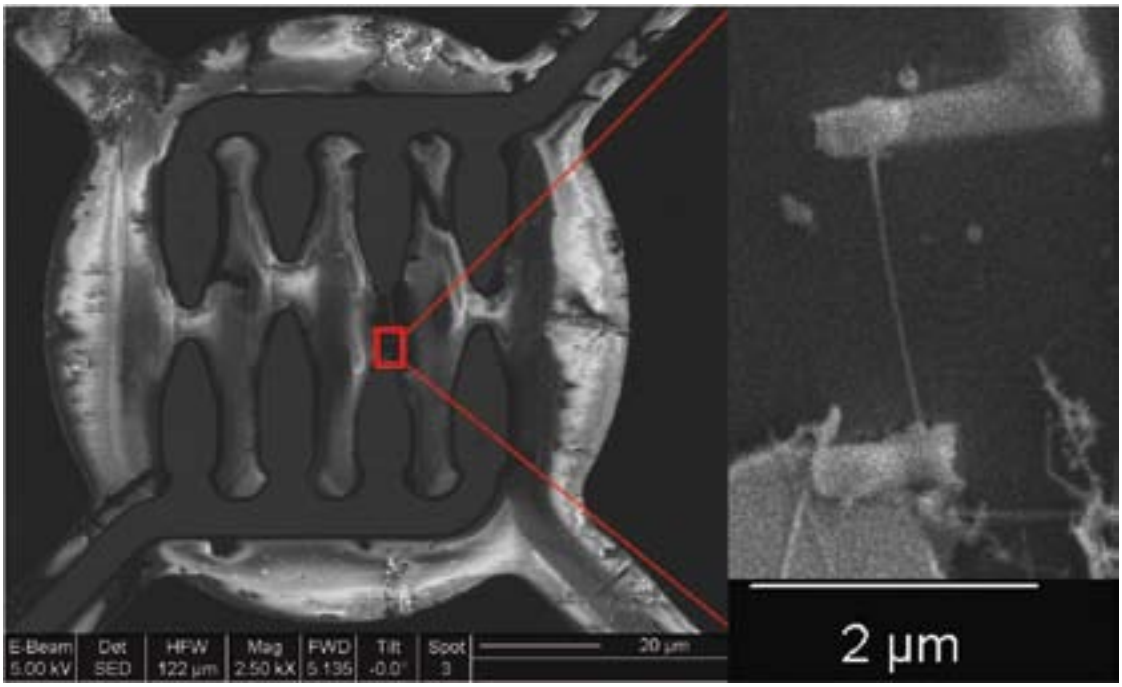


The structure of the pentadecanuclear manganese (II,III) complex $[Mn_{15}(\mu_4\text{-}O)_6(\mu_3\text{-}O)_2(\mu_2\text{-}CH_3O)_4(CH_3O)_2(C_4H_9PO_3)_{10}(4\text{-dmbpy})_2]\cdot 6MeOH$(1) without tert-butyl substituents of the $^tBuPO_3^{2-}$ ligands and phenyl rings. ($C_4H_9PO_3H_2$ = tert-butylphosphonic acid, 4-dmbpy = 4,4'-dimethyl-2,2'-dipyridyl).

The **Magnetism and Functional Molecules Group (GMMF)** has during the period 2010-2011 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. Some of the most relevant highlights for 2010-2011 are **i)** The design of a molecular switch of Fe (II) that exhibits a coupling between the crystallographic phase and the spin state (See Chem., Eur. J. 2011, 17, 8264 8268, cover), **ii)** design and demonstration of a CNOT requirements based on molecular spin and SWAP Quantum Gates (See Physical Review Letters, 2011, 107, 117 203), **iii)** Design and preparation of coordination architectures with predetermined topologies (See Chemical Communications, 2011, 47, 707 709).

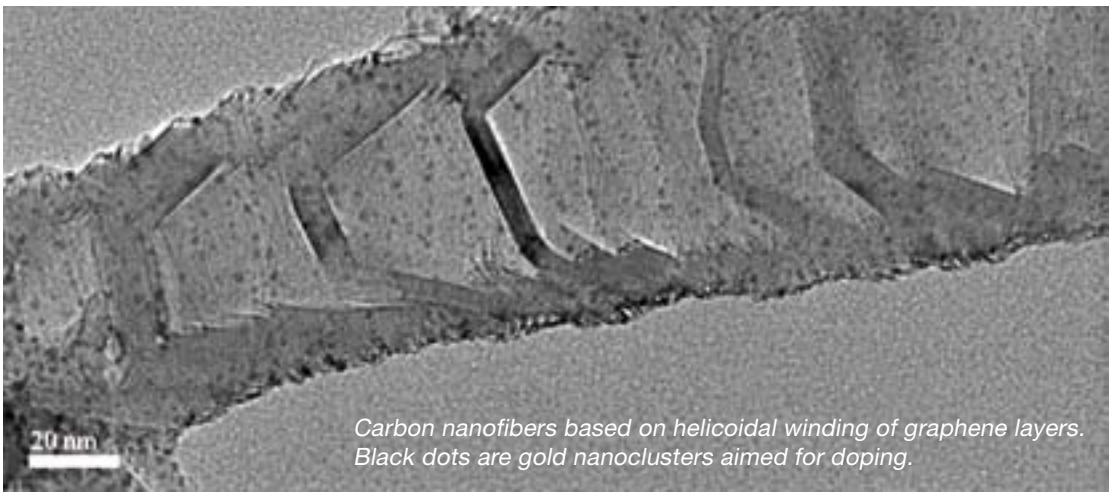
In the field of magnetic materials, the **Magnetism Group** has studied single crystals from gadolinium-germanium metal alloys, prepared by Prof. Vitaliy Pecharsky of Ames (Iowa), which has revealed the anisotropic nature of magnetic deflagration. The group has also studied the dynamics of the magnetic moment in magnetite nanoparticles synthesized by magnetotactic bacteria, and prepared in this case by Dr. Tanya Prozorov of that institution. Regarding the field of superconducting, the magnetic characterisation of different hybrid structures was performed. These structures were prepared by Prof. Carmine Attanasio of the Università degli Studi di Salerno (Italy), in niobium / permalloy / niobium nanometric layers, with the aim of studying the spin-triplet superconductivity. Niobium / copper-manganese hybrids were also prepared in order to analyse exchange bias.

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 line has developed nanodevices and systems based on nanostructures, in order to fabricate a new class of advanced chemical sensors.



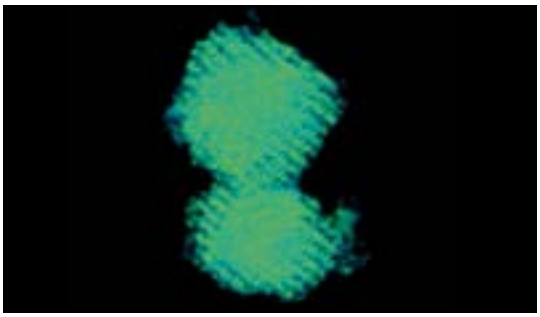
SEM image of a SnO2 gas nanosensor fabricated on top of a microhotplate. The inset corresponds to an enlargement of the red square in the image and allows to see the 50nm-thick SnO2 nanowire contacted using focused electron beam assisted deposition.

Regarding the fabrication of devices based on both monolithic ceramic techniques and in micro and nanoprinting techniques, essential for the development of mass production of devices supported on ceramics or plastic, progress has been made.

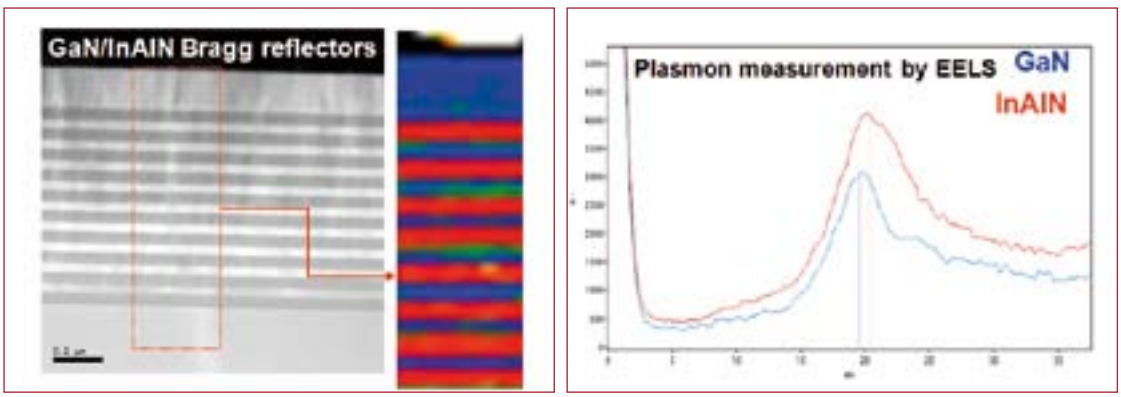


Carbon nanofibers based on helicoidal winding of graphene layers. Black dots are gold nanoclusters aimed for doping.

Research in the field of nanoscopy has focused on the development and exploitation of advanced techniques of transmission electron microscopy (TEM) and image processing, with the aim of obtaining an optimal characterization of materials at nanometric level: TEM has been used, for instance, to determine structural defects and inclusions in metallic and semiconducting matrixes, or to spot additives in both nanostructured materials and devices.



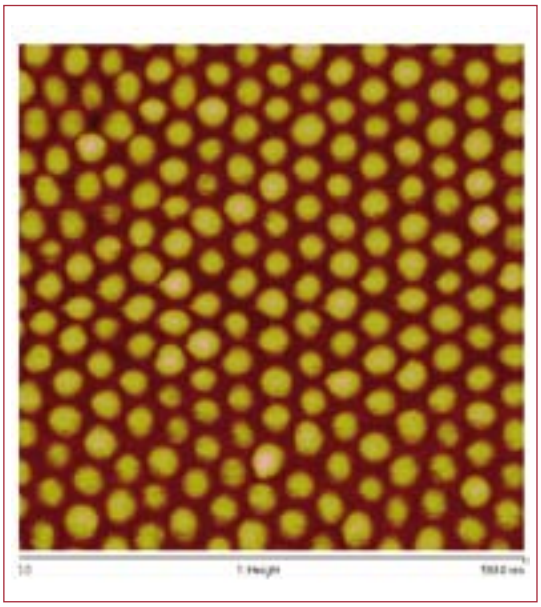
Electron tomography reconstruction of Co_3O_4 templates impregnated with ferrimagnetic Fe_3O_4 (Collaboration with ICN).



Plasmon identification in III-V compounds using STEM - EELS

Moreover, a new type of electrophotonic devices has been produced by using silicon microelectronics. On one hand it has developed the design, fabrication and characterization of sensors based on active microdiscs with silicon nanocrystals, and other devices emitting in the transmission band of optical fibers, and coupled to a waveguide.

We have developed a new lithographic technique that allows to define highly ordered planar structures at nanoscale level, using block copolymers.

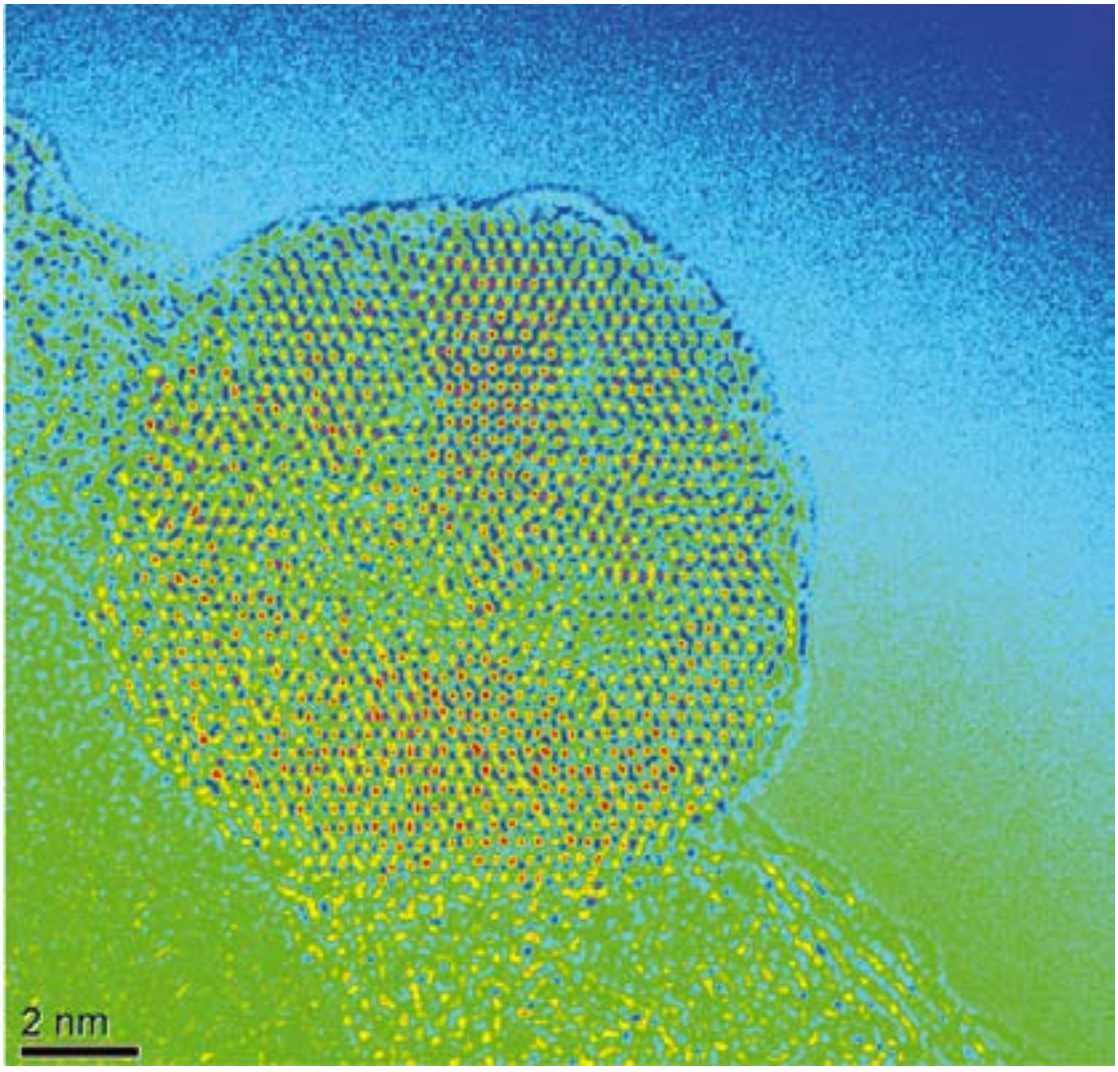


Thin layer of SiO nanopillars deposited onto Si. The image has been obtained by means of Atomic Force Microscopy (AFM).

Progress has been made in modeling of physical processes in the field of interaction of surfaces and formation of nanoparticles, with computational models based on both phenomenological and fundamental approaches.

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.

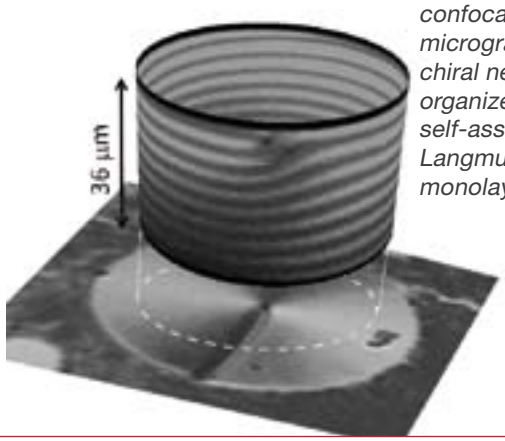
The **Magnetic Nanomaterials Group** has been focusing on the following research aims: **i)** study of the mechanisms of reversal of magnetization and exchange bias (EB) in ferromagnetic / antiferromagnetic (FM / AF) bilayers of nanometric thickness, **ii)** study of new methods of synthesis and properties of magnetic particles of iron oxide with high-quality crystalline and magnetic properties for biomedical uses, **iii)** study of anomalies in the magnetization dynamic response within antiferromagnetic ferritin nanoparticles, **iv)** Monte Carlo simulation of the magnetic behavior in the nanoscale of metallic systems, **v)** study of magnetic correlations in high magnetic fields in the intermetallic alloy Gd5Ge4, a material of technological interest due to its magnetocaloric effect, associated with a magneto-structural transition.



Polycristalline cobalt-ferrite nanoparticle.

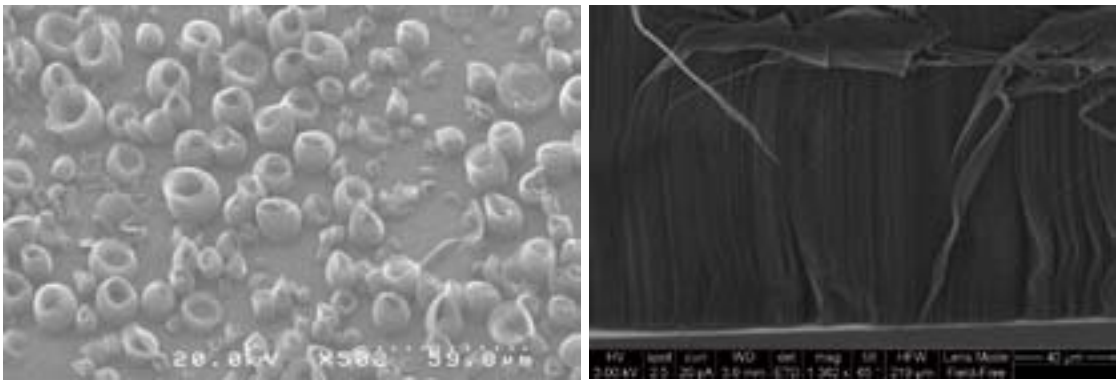
1.5. NANOSTRUCTURED MATERIALS

The **Self-organised Complexity & Self Assembling Materials Group (SOC&SAM)** has developed basic research in the field of Soft Nanotechnology, developing experimental projects that have involded the study of the dynamics and self-assembly of micro-particles by means of external field, the control of flow in biomimmetic surfactant monolayers, and the patterning of liquid crystals in contact with self-assembled monolayers on a solid support. We are developing the new paradigm of two-dimensional microfluidics, which we define as the controlled flow of monolayers in constrained geometries. We have carried on the study of diffusion, mixing and dissolution of co-flowing surfactant monolayers, and we intend to study reaction processes constrained to the contact lines. The combination techniques aimed at controlling the self-assembly of surfactant monolayers and colloidal aggregates with the field of liquid crystal research bears an enormous potential for the development of new active materials and meta-material. The latter may offer challenging problems in basic science and may lead to new unexpected applications.



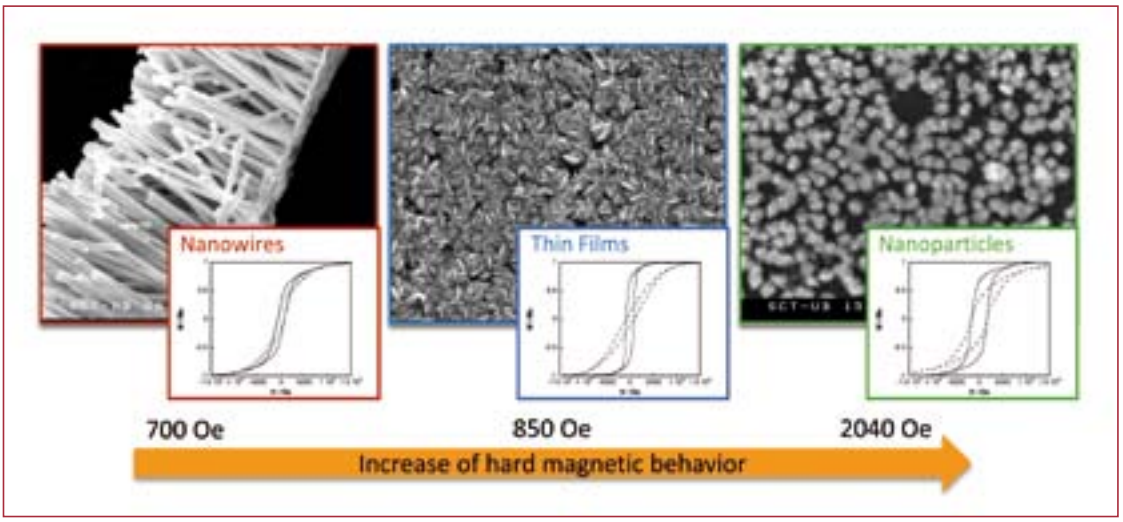
3D fluorescence confocal polarizing micrograph of a chiral nemati phase organized over a self-assembled Langmuir-Blodgett monolayer domain.

The **Physics and Engineering of Nanostructured and Amorphous Materials Group (FEMAN)** has worked towards the development and applications of new nanomaterials, both in the field of thin films and nanostructured surfaces. The project BIOGRAPH has been started up, with the aim of developing systems that have large-area graphene as a basis. On the other hand, the final works regarding the project NANOTRAPPING, focused on extremely high-surface nanostructured materials aimed at trapping specific pollutants, have been carried out. In this context, further studies have been done on the possible applications of carbon nanotubes in the energy field (supercapacitors). Furthermore, research activity in Si and superparamagnetic Fe@C nanoparticles has been completed.



Carbon nanotubes grown under special conditions on silicon.

The **Thin-film and Metallic Micro / Nanostructures Electrodeposition Group** has worked on the use of electrochemical methods for the preparation and characterization of CoPt magnetic micro / nanostructures (that is, submicrometric particles, nanowires, and microstructures electrodeposited in photolithographied substrates), thin films of magnetic alloys (CoP, CoNi, CoNiP), as well as magnetoresistive materials (CoAg) and magnetic composites with possible uses in sensors and MEMS/NEMS devices. Simultaneously, the group has prepared alumina templates and monolayers formation on electrodeposited materials. Moreover, a research line aimed to the electrochemical preparation of magnetic materials (SmCo) by means of ionic liquids has been developed.

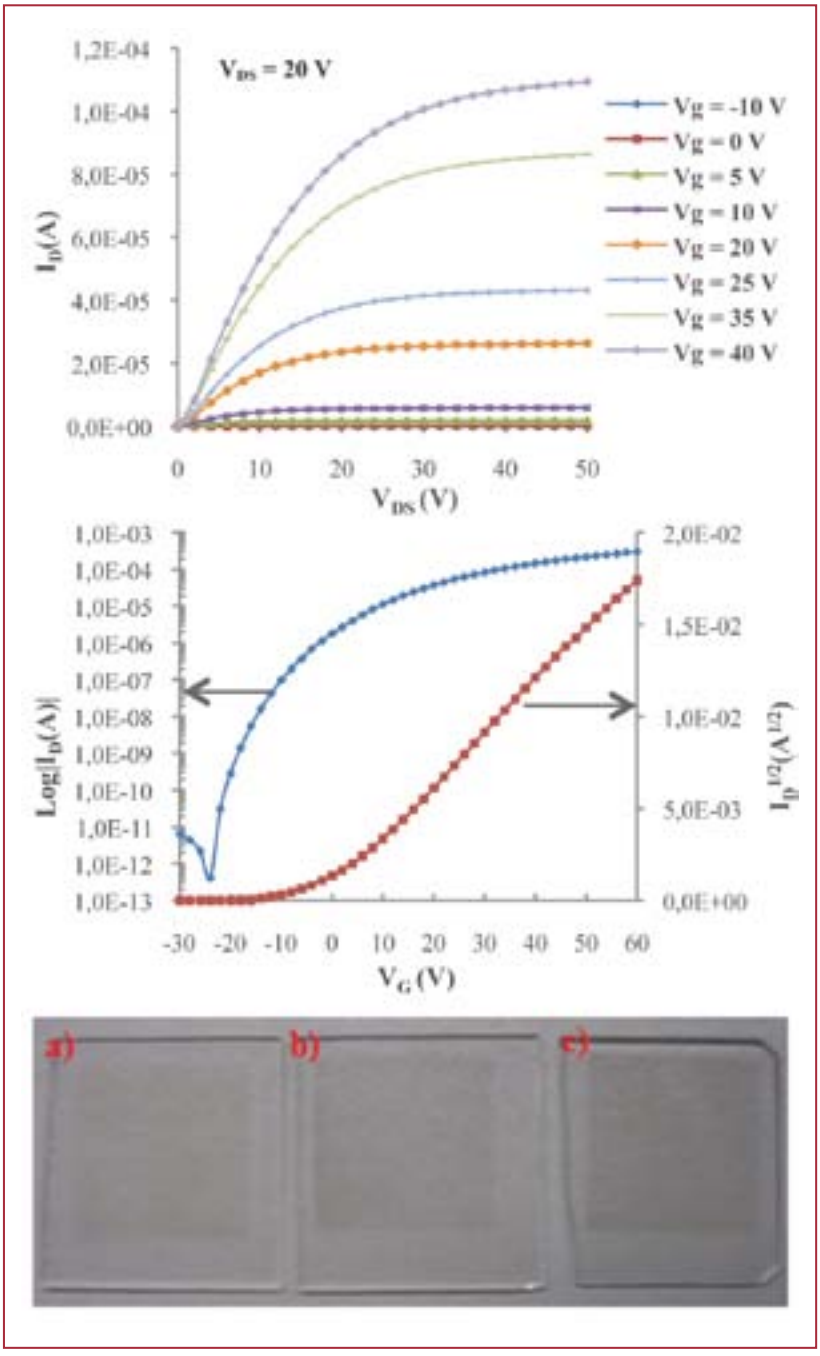


CoPt magnetic nanostructures prepared electrochemically.

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.

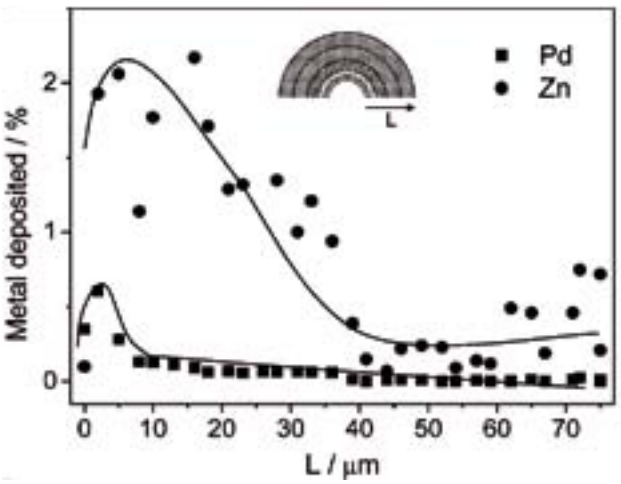
1.6. NANOENERGY: PRODUCTION, STORAGE AND ENVIRONMENT

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.



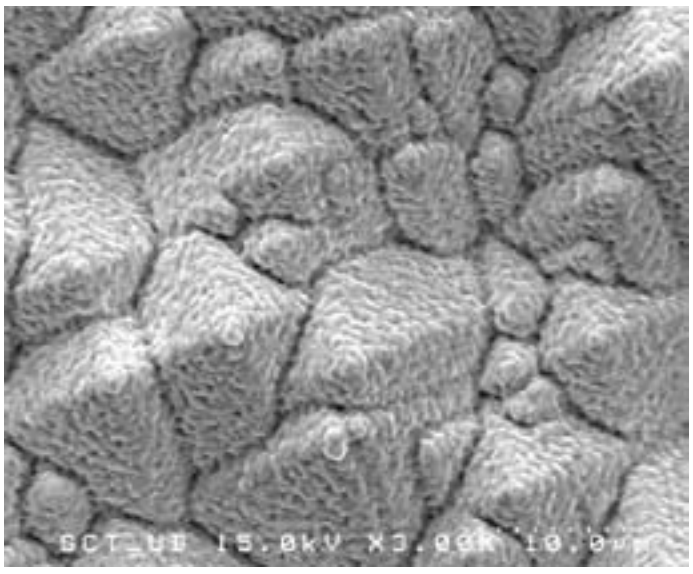
Characteristics I-V curves of thin transistors (TFTs) based on transparent metallic oxides and fabricated by means ok inkjet process.

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 physicochemical characteristics are related to their catalytic behaviour in the aforementioned processes, among others.



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

Within the scope of nanoenergy, The **Solar Energy Grou**p 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.

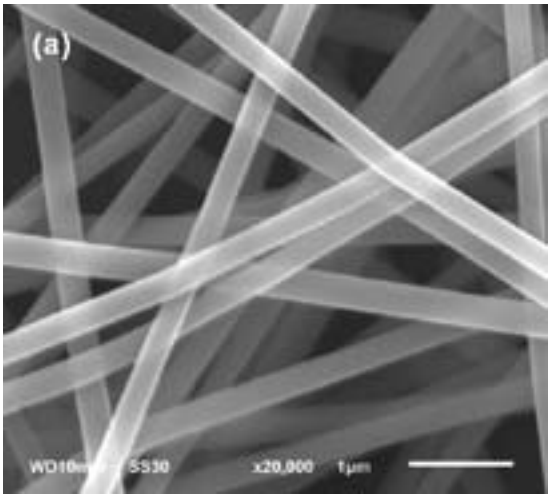


Novel textures developed by the GES by combining micro -and nano- structures, aimed at improving sun light absorption within solar cells as a means of increasing conversion efficiency.

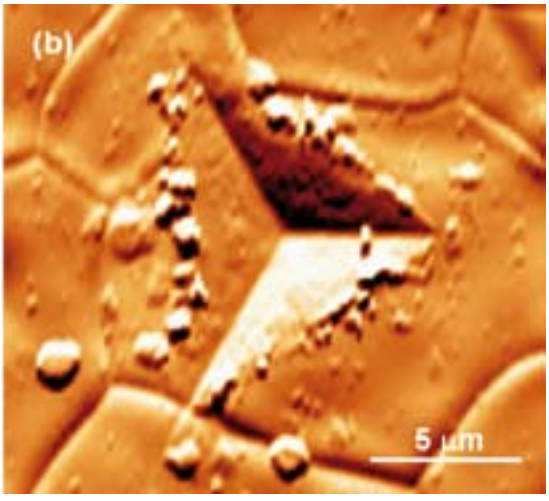
The activity of the **Centre of Design and Optimization of Materials (DIOPMA)** in the field of nanotechnology is related to the following research lines:

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 2010-2011 academic year, the PhD in Nanosciences has received the ***Mención a la Excelencia***, granted by the Ministry of Education (ME-2011-00549). This programme is proposed as a fundamental tool for training new researchers in this field, and as a natural continuation of the Master in Nanoscience and Nanotechnology for those students wishing to complete their education with a doctorate. During the academic year 2010/2011, 21 new students have enrolled (first year). The total number of students enrolled in this course is 41. The PhD program in Nanoscience began during the 2007-2008 academic year and from then until November 2011, a number of 10 doctoral theses have been read. The theses read during the academic year 2010-2011 are the following:

  - ***Síntesi i caracterització d'òxid de titani nanoestructurat per aplicacions energètiques.*** Author: Cristian Fàbrega Gallego. Supervisor: Joan Ramon Morante Lleonart.

  - **Mechanotransduction mechanisms induced by microstructured polymer substrates: effects on cell morphology and migration.**
    Author: Maruxa Estévez Fernández. Supervisor: Josep Samitier.

  - **Exchange bias in Ni/FeF2 thin films and nanostructures.**
    Author: Mirosavna Kovylina. Supervisor: Xavier Batlle.

  - **Electron Microscopy analysis of semiconductor nanowire complex structures: from axial and coaxial quantum wells to local stacking transformations in atomic structures.** Author: Sonia Conesa Boj. Supervisor: Francesca Peiró.

  - **Biofunctional Micropatterned Surfaces to Study, Manipulate and Control Spatiotemporal Organisation of Cell Membrane Receptors in Living Cells.**
    Author: Ruth Díez Ahedo. Supervisor: María García Parajó.

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

- Thanks to the funding of the MICINN, the IN²UB has been able to cofund a high vacuum evaporation equipment for common use in the Micro and Nanotechnology Laboratory (clean room) of the Faculty of Physics at the UB. Moreover, the IN²UB has continued its cofunding of the clean room, together with the Faculty of Physics, making in this way possible the acquisition of diverse small equipment, as well as lab consumables and clothing.

- Between October 2010 and October 2011, the IN²UB has organized seminars and conferences listed below:

  - **Rogério Gaspar (Universidade de Lisboa)**
    IV Jornada IN²UB. November 2011.

  - **Amos Sharoni (Bar Ilan University)**
    Properties of Complex Oxides at the Nanoscale: First Order Phase Transitions through Avalanches. October 2011.

  - **Axel Hoffmann (Argonne National Laboratory)**
    Pure Spin Currents: Discharging Spintronics. June 2011.

  - **Matthias Brust (University of Liverpool)**
    Gold Nanoparticles for Biomedical Applications. May 2011.

  - **Abdelhamid Errachid (Université Claude Bernard, Lyon)**
    Novel Techniques Based on Submerged Microcontact Printing for bio-Patterning Surfaces. February 2011.

  - **Carla Cirillo (Università degli Studi di Salerno)**
    Transport Properties of Superconductor/Ferromagnet Hybrids. December 2010.

- The IN²UB organised its yearly meeting on November 14. This fourth edition of the meeting was held at the Col·legi Oficial de Metges de Barcelona (COMB) 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 40 posters presented by young researchers and to atttend nine lectures offered by an international plenary speaker, members of the IN²UB , and young researchers.

- 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.

- 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. Thoughout 2011, the organising committee of ICM 2015 has met twice in order to prepare the presentation of the Barcelona edition of the conference at ICM 2012, which is to be held in Busan in July 2012.

  In addition, and connected to international conferences, the IN²UB has funded or cofunded the following:

  1. Creation of website MOLMAT 2012 (see http://molmat2012.com/);

  2. PCB-BKC IN²UB common stand at Imagine Nano (Bilbao, April 2011).

APPENDIX 1

LIST OF PROJECTS FUNDED 2010-2011

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: Universitat de Barcelona

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: Universitat de Barcelona

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:** Universitat de Barcelona

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

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: Universitat de Barcelona

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: Universitat de Barcelona

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

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

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

Principal Investigator: IGNACIO PAGONABARRAGA MORA (Física Fonamental)
Title: **Unveiling the physics of cellular processes: new approaches to study macromolecules at work (MacromoleculesAtWork)**
Reference: PIEF-GA-2008-219678
Institution: Universitat de Barcelona

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: **Desarrollo de nuevos catalizadores enzimáticos para biotecnología de la lignocelulosa. Optimización de productos papeleros reciclados**
Reference: CTQ2007-68003-C02-02/PPQ
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: **An Open, Ubiquitous and Adaptative Chronic Disease Management Platform for COPD and Renal Insufficiency (CHRONIUS) EU**
Reference: 216461
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: 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: 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: FELIX RITORT FARRAN (Física Fonamental)
Title: Single molecule investigation of nucleic acids free energy landscapes: Bringing together computational models and laser tweezer experiments (SMINAFEL)
EU Reference: PIEF-GA-2008-236562
Institution: Universitat de Barcelona

Principal Investigator: FELIX RITORT FARRAN (Física Fonamental)
Title: Termodinámica de noequillibrio y cinética de plegamiento en moléculas individuales con resolución de 1kT
Reference: FIS2007-61433
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: ALBERTO FERRER PRATS (Bioquímica i Biologia Molecular (Farmacia)
Title: **Ingenieria metabólica de la vía del mevalonato en Arabidopsis thaliana: redirección del flujo de prenildifosfatos para producir terpenoides volátiles de interés biotecnológico.**
Reference: BIO2009-06984
Institution: Universitat de Barcelona

Principal Investigator: ALBERTO BORONAT MARGOSA (Bioquímica i Biologia Molecular)
Title: **Euphorbia lathyris, un cultivo potencial para la producción de biocombustibles de tercera generación**
Reference: PLE2009-0003
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: BORONAT MARGOSA (Bioquímica i Biologia Molecular)
Title: **Centro de genómica Básica y de orientación Agroalimentaria**
Reference: CSD2007-00036
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: 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

Title: Quiralitat en superfícies i màquines moleculars.
Reference: 2009SGR158
Institution: CSIC

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: **Procesos de escritura directa con láser para su aplicación a microsistemas de análisis total**
Reference: MAT2007-62357
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: UB

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

Principal Investigator: 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: **Diagnóstico precoz de cáncer de próstata mediante nanobiosensores basados en receptores olfativos**
Reference: PI071162
Institution: Universitat de Barcelona

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: JOSEP SAMITIER MARTI (Electrònica)

Title: **Bioingenieria, Biomateriales y Nanomedicina** **Reference:** CB06/01/0055
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: **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 Ki-Nematics 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

Principal Investigator: JOSEP SAMITIER MARTI (Electrònica)
Title: **Bioelectronic Olfactory Neuron Device** **EU Reference:** 228685
Institution: IBEC-Institut de Bioenginyeria de Catalunya

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: MARIA JOSE GARCIA CELMA (Farmàcia i Tecn. 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: 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 tex-

tiles 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: Tecnologías de sensado nanofotónicas
Reference: TSI-020301-2008-11
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: 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: AMILCAR LABARTA RODRIGUEZ (Física Fonamental)
Title: Nanobiomed
Reference: CSD2006-00012
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: **Sistemas Multifuncionales de Absorción de Contaminantes Emergentes Basados en Nanotubos de Carbono** **Reference:** CTQ2009-14671-C02-01
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: 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: SANTIAGO ESPLUGAS VIDAL (Enginyeria Química)
Title: **Concepción integral de la EDAR del siglo XXI. Desarrollo de tecnologías para el tratamiento y recuperación de recursos en aguas residuales (ETRRA)**
Reference: CSD2007-00055 **Institution:** Universitat de Barcelona

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: 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: Autoorganización en materia blanda: Materiales autoenamblantes, fluídos complejos y sistemas biológicos
Reference: FIS2006-03525/
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:** 009SGR440 **Institution:** Institut de Recerca en Energia de Catalunya

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

Principal Investigator: JOAN RAMON MORANTE LLEONART (Electrònica) **Title: Nuevas**

utilizaciones industriales sostenibles del CO2 Reference: CEN-2008 - 1027
Institution: 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: 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: Institut de Recerca en Energia de Catalunya

Principal Investigator: JOAN RAMON MORANTE LLEONART (Electrònica)
Title: S3 EU
Reference: FP7-NMP-2009-47768
Institution: 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:** FBG

APPENDIX 2

LIST OF PUBLICATIONS

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

TOWARD A DENSITY FUNCTIONAL DESCRIPTION OF LIQUID pH(2)

Author(s): Navarro J.; Ancilotto F.; Barranco M.; et al. **Source:** JOURNAL OF PHYSICAL CHEMISTRY A **Volume:** 115 **Issue:** 25 **Special Issue:** Yes **Pages:** 6910-6917 **DOI:** 10.1021/jp111996u **Published:** JUN 30 2011

ABSORPTION SPECTRUM OF ATOMIC IMPURITIES IN ISOTOPIC MIXTURES OF LIQUID HELIUM

Author(s): Mateo David; Hernando Alberto; Barranco Manuel; et al. **Source:** PHYSICAL REVIEW B **Volume:** 83 **Issue:** 17 **Article Number:** 174505 **DOI:** 10.1103/PhysRevB.83.174505 **Published:** MAY 6 2011

Li ATOMS ATTACHED TO HELIUM NANODROPLETS

Author(s): Hernando Alberto; Mayol Ricardo; Pi Marti; et al. **Source:** INTERNATIONAL JOURNAL OF QUANTUM CHEMISTRY **Volume:** 111 **Issue:** 2 **Pages:** 400-405 **DOI:** 10.1002/qua.22636 **Published:** FEB 2011

EXCITED ELECTRON-BUBBLE STATES IN SUPERFLUID (4)He: A TIME-DEPENDENT DENSITY FUNCTIONAL APPROACH

Author(s): Mateo David; Jin Dafei; Barranco Manuel; et al. **Source:** JOURNAL OF CHEMICAL PHYSICS **Volume:** 134 **Issue:** 4 **Article Number:** 044507 **DOI:** 10.1063/1.3544216 **Published:** JAN 28 2011

GROUND STATE AND INFRARED RESPONSE OF TRIPLE CONCENTRIC QUANTUM RING STRUCTURES

Author(s): Maria Escartin Jose; Barranco Manuel; Pi Marti **Source:** PHYSICAL REVIEW B **Volume:** 82 **Issue:** 19 **Article Number:** 195427 **DOI:** 10.1103/PhysRevB.82.195427 **Published:** NOV 15 2010

HELIUM ON NANOPATTERNED SURFACES AT FINITE TEMPERATURE

Author(s): Hernandez E. S.; Ancilotto F.; Barranco M.; et al. **Conference:** 33rd International Workshop on Condensed Matter **Theories Location:** Quito, ECUADOR **Date:** AUG 16-22, 2009 **Sponsor(s):** SENACYT **Source:** INTERNATIONAL JOURNAL OF MODERN PHYSICS B **Volume:** 24 **Issue:** 25-26 **Special Issue:** Yes **Pages:** 4915-4922 **DOI:** 10.1142/S0217979210057092 **Published:** OCT 20 2010

CALORIC EFFECTS INDUCED BY MAGNETIC AND MECHANICAL FIELDS IN A Ni(50) Mn(25-X)Ga(25)Co(X) MAGNETIC SHAPE MEMORY ALLOY

Author(s): Castillo-Villa P. O.; Soto-Parra D. E.; Matutes-Aquino J. A.; et al. **Source:** PHYSICAL REVIEW B **Volume:** 83 **Issue:** 17 **Article Number:** 174109 **DOI:** 10.1103/PhysRevB.83.174109 **Published:** MAY 16 2011

TEMPERATURE CONTOUR MAPS AT THE STRAIN-INDUCED MARTENSITIC TRANSITION OF A Cu-Zn-Al SHAPE-MEMORY SINGLE CRYSTAL

Author(s): Vives Eduard; Burrows Susan; Edwards Rachel S.; et al. **Source:** APPLIED PHYSICS LETTERS **Volume:** 98 **Issue:** 1 **Article Number:** 011902 DOI: 10.1063/1.3533403 **Published:** JAN 3 2011

DETERMINATION OF THE ZETA POTENTIAL FOR HIGHLY CHARGED COLLOIDAL SUSPENSIONS

Author(s): Giupponi Giovanni; Pagonabarraga Ignacio **Source:** PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY A-MATHEMATICAL PHYSICAL AND ENGINEERING SCIENCES **Volume:** 369 **Issue:** 1945 **Pages:** 2546-2554 **DOI:** 10.1098/rsta.2011.0024 **Published:** JUN 28 2011

COLLOID ELECTROPHORESIS FOR STRONG AND WEAK ION DIFFUSIVITY

Author(s): Giupponi Giovanni; Pagonabarraga Ignacio **Source:** PHYSICAL REVIEW LETTERS **Volume:** 106 **Issue:** 24 **Article Number:** 248304 **DOI:** 10.1103/PhysRevLett.106.248304 **Published:** JUN 17 2011

NONISOTHERMAL DIFFUSION-REACTION WITH NONLINEAR KRAMERS KINETICS

Author(s): Ortiz de Zarate Jose M.; Bedeaux Dick; Pagonabarraga Ignacio; et al. **Conference:** 9th International Meeting on Thermodiffusion (IMT9) **Location:** Univ Paul Sabatier, Toulouse, France **Date:** Jun 07-11, 2010 **Sponsor(s):** Int Grp Res Thermodiffusion **Source:** COMPTES RENDUS MECANIQUE **Volume:** 339 **Issue:** 5 **Special Issue:** Yes **Pages:** 287-291 **DOI:** 10.1016/j.crme.2011.03.003 **Published:** MAY 2011

CONTROLLED DROP EMISSION BY WETTING PROPERTIES IN DRIVEN LIQUID FILAMENTS

Author(s): Ledesma-Aguilar R.; Nistal R.; Hernandez-Machado A.; et al. **Source:** NATURE MATERIALS **Volume:** 10 **Issue:** 5 **Pages:** 367-371 **DOI:** 10.1038/NMAT2998 **Published:** MAY 2011

GROWTH SATURATION OF UNSTABLE THIN FILMS ON TRANSVERSE-STRIPED HYDROPHILIC-HYDROPHOBIC MICROPATTERNS

Author(s): Ledesma-Aguilar R.; Hernandez-Machado A.; Pagonabarraga I. **Source:** SOFT MATTER **Volume:** 7 **Issue:** 13 **Pages:** 6051-6060 **DOI:** 10.1039/c1sm05270e **Published:** 2011

CONTROLLING PROTEIN CRYSTAL GROWTH RATE BY MEANS OF TEMPERATURE

Author(s): Sanamaria-Holek I.; Gadomski A.; Rubi J. M. **Source:** JOURNAL OF PHYSICS-CONDENSED MATTER **Volume:** 23 **Issue:** 23 **Article Number:** 235101 **DOI:** 10.1088/0953-8984/23/23/235101 **Published:** JUN 15 2011

OPTIMAL RESTING-GROWTH STRATEGIES OF MICROBIAL POPULATIONS IN FLUCTUATING ENVIRONMENTS

Author(s): Geisel Nico; Vilar Jose M. G.; Miguel Rubi J. **Source:** PLOS ONE **Volume:** 6 **Issue:** 4 **Article Number:** e18622 **DOI:** 10.1371/journal.pone.0018622 **Published:** APR 15 2011

TEMPERATURE AT SMALL SCALES: A LOWER LIMIT FOR A THERMODYNAMIC DESCRIPTION

Author(s): Simon J. -M.; Rubi J. M. **Source:** JOURNAL OF PHYSICAL CHEMISTRY B **Volume:** 115 **Issue:** 6 **Pages:** 1422-1428 **DOI:** 10.1021/jp106224j **Published:** FEB 17 2011

MAGNETIZATION DYNAMICS IN THE INERTIAL REGIME: NUTATION PREDICTED AT SHORT TIME SCALES

Author(s): Ciornei M. -C.; Rubi J. M.; Wegrowe J. -E. **Source:** PHYSICAL REVIEW B **Volume:** 83 **Issue:** 2 **Article Number:** 020410 **DOI:** 10.1103/PhysRevB.83.020410 **Published:** JAN 24 2011

THERMODYNAMICS AND STOCHASTIC DYNAMICS OF TRANSPORT IN CONFINED MEDIA

Author(s): Rubi J. M.; Reguera D. **Source:** CHEMICAL PHYSICS **Volume:** 375 **Issue:** 2-3 **Pages:** 518-522 **DOI:** 10.1016/j.chemphys.2010.04.029 **Published:** OCT 5 2010

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Author(s): Perez-Madrid Agustin; Miguel Rubi J.; Lapas Luciano C. **Conference:** Joint European Thermodynamics Conference (JETC10) **Location:** Univ Copenhagen, Niels Bohr Inst, Copenhagen, Denmark **Date:** JUN22-24,2009 **Source:** JOURNAL OF NON-EQUILIBRIUM THERMODYNAMICS **Volume:** 35 **Issue:** 3 **Special Issue:** Yes **Pages:** 279-288 **DOI:** 10.1515/JNETDY.2010.017 **Published:** OCT 2010

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Author(s): Lervik Anders; Bresme Fernando; Kjelstrup Signe; et al. **Source:** PHYSICAL CHEMISTRY CHEMICAL PHYSICS **Volume:** 12 **Issue:**7 **Pages:** 1610-1617 **DOI:** 10.1039/b918607g **Published:** 2010

NANOBIOTECHNOLOGY

WEAK DISORDER: ANOMALOUS TRANSPORT AND DIFFUSION ARE NORMAL YET AGAIN

Author(s): Khoury M.; Lacasta A. M.; Sancho J. M.; et al. **Source:** PHYSICAL REVIEW LETTERS **Volume:** 106 **Issue:** 9 **Article Number:** 090602 **DOI:** 10.1103/PhysRevLett.106.090602 **Published:** MAR 2 2011

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Author(s): Orlandi Javier G.; Blanch-Mercader Carles; Brugues Jan; et al. **Source:** PHYSICAL REVIEW E **Volume:** 82 **Issue:** 6 **Article Number:** 061903 **DOI:** 10.1103/PhysRevE.82.061903 **Part:** Part 1 **Published:** DEC 7 2010

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Author(s): Perez-Carrasco R.; Sancho J. M. **Source:** PHYSICAL REVIEW E **Volume:** 84 **Issue:** 4 **Article Number:** 041915 **DOI:** 10.1103/PhysRevE.84.041915 **Part:** Part 1 **Published:** OCT 14 2011

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Author(s): Sancristobal B.; Sancho J. M.; Garcia-Ojalvo J. **Source:** PHYSICAL REVIEW E **Volume:** 82 **Issue:** 4 **Article Number:** 041908 **DOI:** 10.1103/PhysRevE.82.041908 **Part:** Part 1 **Published:** OCT 12 2010

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Author(s): Gallego Isaac; Oncins Gerard; Sisquella Xavier; et al. **Source:** BIOPHYSICAL JOURNAL **Volume:** 99 **Issue:** 12 **Pages:** 3951-3958 **DOI:** 10.1016/j.bpj.2010.11.015 **Published:** DEC 15 2010

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Author(s): Sabate Raimon; Espargaro Alba; de Groot Natalia S.; et al.

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Author(s): Ribezzi Crivellari M.; Huguet J. M.; Ritort F. **Editor(s):** Garrido PL; Marro J; DeLosSantos F **Conference:** 11th Granada Seminar on Computational and Statistical **Physics Location:** La Herradura, SPAIN Date: SEP 13-17, 2010 **Sponsor(s):** Spanish Minist Sci & Technol; Region Adm Junta Andalucia; European Phys Soc; Inst Carlos I Theoret & Comp Phys; Univ Granada **Source:** NON-EQUILIBRIUM STATISTICAL PHYSICS TODAY **Book Series:** AIP Conference **Proceedings Volume:** 1332 **Pages:** 294-294 **DOI:** 10.1063/1.3569555 **Published:** 2011

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Author(s): Pigni Natalia B.; Berkov Strahil; Elamrani Abdelaziz; et al. **Source:** MOLECULES **Volume:** 15 **Issue:** 10 **Pages:** 7083-7089**DOI:** 10.3390/molecules15107083 **Published:** OCT 2010

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Author(s): Mir Monica; Martinez-Rodriguez Sergio; Castillo-Fernandez Oscar; et al. **Source:** ELECTROPHORESIS **Volume:** 32 **Issue:** 8 **Pages:** 811-821 **DOI:** 10.1002/elps.201000487 **Published:** APR 2011

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Author(s): Ivon Rodriguez-Villarreal Angeles; Tarn Mark D.; Madden Leigh A.; et al. **Source:** LAB ON A CHIP **Volume:** 11 **Issue:** 7 **Pages:** 1240-1248 **DOI:** 10.1039/c0lc00464b **Published:** 2011

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Author(s): Alcalde Ermitas; Dinares Immaculada; Ibanez Anna; et al. **Source:** CHEMICAL COMMUNICATIONS **Volume:** 47 **Issue:** 11 **Pages:** 3266-3268 **DOI:** 10.1039/c0cc05350c **Published:** 2011

LIQUIDS MICROPRINTING THROUGH A NOVEL FILM-FREE FEMTOSECOND LASER BASED TECHNIQUE

Author(s): Patrascioiu A.; Duocastella M.; Fernandez-Pradas J. M.; et al. **Source:** APPLIED SURFACE SCIENCE **Volume:** 257 **Issue:** 12 **Pages:** 5190-5194 **DOI:** 10.1016/j.apsusc.2010.11.093 **Published:** APR 1 2011

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Author(s): Fernandez-Pradas J. M.; Serrano D.; Bosch S.; et al. **Source:** APPLIED SURFACE SCIENCE **Volume:** 257 **Issue:** 12 **Pages:** 5219-5222 **DOI:** 10.1016/j.apsusc.2010.11.008 **Published:** APR 1 2011

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Author(s): Duocastella M.; Patrascioiu A.; Dinca V.; et al. **Source:** APPLIED SURFACE SCIENCE **Volume:** 257 **Issue:** 12 **Pages:** 5255-5258 **DOI:** 10.1016/j.apsusc.2010.10.148 **Published:** APR 1 2011

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ADVANTAGEOUS USE OF NOVEL GEMINI IMIDAZOLIUM AMPHIPHILES FOR THE SYNTHESIS, STABILISATION AND DRUG DELIVERY FROM GOLD NANOPARTICLES

Author(s): Lucía Casal-Dujat, Mafalda Rodrigues, Alex Yagüe, Anna C. Calpena, David Amabilino, Javier González-Linares, Miquel Borràs, and Lluïsa Pérez-García **Journal:** CHEMISTRY - AN EUROPEAN JOURNAL KEY **Year:** 2011 **Place of publication:** ENGLAND

MACROCYCLIC IONIC LIQUID CRYSTALS

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BIOFUNCTIONALIZATION OF MICRONANOTOOLS TO TAG LIVING CELLS

Authors (signature): Penón, O.; Novo, S.; Nogués, C.; Plaza, J.A.; Pérez-García, L. **Journal:** CHEMICAL COMMUNICATIONS KEY **Year:** 2011 **Place of publication:** ENGLAND

NANOPHARMACOTHERAPY

- **FORMATION OF POLYMERIC NANO-EMULSIONS BY A LOW-ENERGY METHOD AND THEIR USE FOR NANOPARTICLE PREPARATION**
  Author(s): Caldero Gabriela; Garcia-Celma Maria Jose; Solans Conxita **Source:** JOURNAL OF COLLOID AND INTERFACE SCIENCE **Volume:** 353 **Issue:** 2 **Pages:** 406-411 **DOI:** 10.1016/j.jcis.2010.09.073 **Published:** JAN 15 2011

- **INFLUENCE OF CORONA PLASMA TREATMENT ON POLYPROPYLENE AND POLYAMIDE 6.6 ON THE RELEASE OF A MODEL DRUG**
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- **PREPARATION, CHARACTERIZATION AND BIOCOMPATIBILITY STUDIES ON RISPERIDONE-LOADED SOLID LIPID NANOPARTICLES (SLN): HIGH PRESSURE HOMOGENIZATION VERSUS ULTRASOUND**
  Author(s): Silva A. C.; Gonzalez-Mira E.; Garcia M. L.; et al. **Source:** COLLOIDS AND SURFACES B-BIOINTERFACES **Volume:** 86 **Issue:** 1 **Pages:** 158-165 DOI: 10.1016/j.colsurfb.2011.03.035 **Published:** AUG 1 2011

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  Author(s): Gonzalez-Mira E.; Egea M. A.; Souto E. B.; et al. **Source:** NANOTECHNOLOGY **Volume:** 22 **Issue:** 4 **Article Number:** 045101 **DOI:** 10.1088/0957-4484/22/4/045101 **Published:** JAN 28 2011

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- **TRICYCLIC ANTIDEPRESSANTS-LOADED BIODEGRADABLE PLGA NANOPARTICLES: IN VITRO CHARACTERIZATION AND IN VIVO ANALGESIC AND ANTI-ALLODYNIC EFFECT**
  Author(s): Garcia Xavier; Escribano Elvira; Colom Helena; et al. **Source:** CURRENT NANOSCIENCE **Volume:** 7 **Issue:** 3 **Pages:** 345-353 **Published:** JUN 201

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- **SOFT NANOPARTICLES (THERMO-RESPONSIVE NANOGELS AND BICELLES) WITH BIOTECHNOLOGICAL APPLICATIONS: FROM SYNTHESIS TO SIMULATION THROUGH COLLOIDAL CHARACTERIZATION**
  Author(s): Ramos Jose; Imaz Ainara; Callejas-Fernandez Jose; et al. **Source:** SOFT MATTER Volume: 7 **Issue:** 11 **Pages:** 5067-5082 **DOI:** 10.1039/c0sm01409e **Published:** 2011

NANOMAGNETISM, NANOELECTRONICS AND NANOPHOTONICS

Cu(2)(II)L BASED POLYMERIC LADDER USING DICYANAMIDE BRIDGES: SYNTHESIS, CRYSTAL STRUCTURE AND MAGNETIC STUDIES

Author(s): Fondo Matilde; Garcia-Deibe Ana M.; Ocampo Noelia; et al. **Source:** INORGANICA CHIMICA ACTA **Volume:** 373 **Issue:** 1 **Pages:** 73-78 **DOI:** 10.1016/j.ica.2011.03.054 **Published:** JUL 15 2011

THE USE OF A BIS(PHENYLPYRAZOLYL)PYRIDYL LIGAND TO PREPARE [Mn(4)] AND [Mn(10)] CAGE COMPLEXES

Author(s): Sanchez Costa Jose; Craig Gavin A.; Barrios Leoni A.; et al. **Source:** CHEMISTRY-A EUROPEAN JOURNAL **Volume:** 17 **Issue:** 18 **Pages:** 4960-4963 **DOI:** 10.1002/chem.201003329 **Published:** APR 2011

COUPLED CRYSTALLOGRAPHIC ORDER-DISORDER AND SPIN STATE IN A BISTABLE MOLECULE: MULTIPLE TRANSITION DYNAMICS

Author(s): Craig Gavin A.; Sanchez Costa Jose; Roubeau Olivier; et al. **Source:** CHEMISTRY-A EUROPEAN JOURNAL **Volume:** 17 **Issue:** 11 **Pages:** 3120-3127 **DOI:** 10.1002/chem.201003197 **Published:** MAR 2011

TRIAZOLES AND TETRAZOLES: PRIME LIGANDS TO GENERATE REMARKABLE COORDINATION MATERIALS

Author(s): Aromi Guillem; Barrios Leoni A.; Roubeau Olivier; et al. **Source:** COORDINATION CHEMISTRY REVIEWS **Volume:** 255 **Issue:** 5-6 **Pages:** 485-546 **DOI:** 10.1016/j.ccr.2010.10.038 **Published:** MAR 2011

MOLECULAR ASSEMBLY OF TWO [Co(II)(4)] LINEAR ARRAYS

Author(s): Aguila David; Barrios Leoni A.; Roubeau Olivier; et al. **Source:** CHEMICAL COMMUNICATIONS **Volume:** 47 **Issue:** 2 **Pages:** 707-709 **DOI:** 10.1039/c0cc03646c **Published:** 2011

MOLECULAR [Co(III)Co(II)] X 2 ASSEMBLIES OF A NEW BIS-PHENOL/PYRAZOLYL LIGAND

Author(s): Craig Gavin A.; Sanchez Costa Jose; Aguila David; et al. **Source:** NEW JOURNAL OF CHEMISTRY **Volume:** 35 **Issue:** 6 **Pages:** 1202-1204 **DOI:** 10.1039/c0nj00861c **Published:** 2011

DOUBLE-Co(3)(2-) CENTERED [Co(5)(II)] WHEEL AND MODELING OF ITS MAGNETIC PROPERTIES

Author(s): Sarkar Mrinal; Aromi Guillem; Cano Joan; et al. **Source:** CHEMISTRY-A EUROPEAN JOURNAL **Volume:** 16 **Issue:** 46 **Pages:** 13825-13833 **DOI:** 10.1002/chem.201001418 **Published:** DEC 2010

AN EDDY-CURRENT-BASED SENSOR FOR PREVENTING KNOTS IN METALLIC WIRE DRAWING PROCESSES

Author(s): Esteban Bernat; Riba Jordi-Roger; Baquero Grau; et al. **Source:** NONDESTRUCTI-

VE TESTING AND EVALUATION **Volume:** 26 **Issue:** 2 **Pages:** 169-180 **Article Number:** PII 936106107 **DOI:** 10.1080/10589759.2010.545128 **Published:** 2011

- **LONG-RANGE ORDER OF Ni(2+) AND Mn(4+) AND FERROMAGNETISM IN MULTIFERROIC (Bi(0.9)La(0.1))(2)NiMnO(6) THIN FILMS**
  Author(s): Langenberg E.; Rebled J.; Estrade S.; et al. **Source:** JOURNAL OF APPLIED PHYSICS **Volume:** 108 **Issue:** 12 Article **Number:** 123907 **DOI:** 10.1063/1.3524278 **Published:** DEC 15 2010

- **STRAIN-DRIVEN NONCOLLINEAR MAGNETIC ORDERING IN ORTHORHOMBIC EPITAXIAL YMnO(3) THIN FILMS**
  Author(s): Marti X.; Skumryev V.; Laukhin V.; et al. **Source:** JOURNAL OF APPLIED PHYSICS **Volume:** 108 **Issue:** 12 **Article Number:** 123917 **DOI:** 10.1063/1.3514575 **Published:** DEC 15 2010

- **QUANTUM TUNNELING OF THE INTERFACES BETWEEN NORMAL-METAL AND SUPERCONDUCTING REGIONS OF A TYPE-I Pb SUPERCONDUCTOR**
  Author(s): Chudnovsky E. M.; Velez S.; Garcia-Santiago A.; et al. **Source**: PHYSICAL REVIEW B **Volume:** 83 **Issue**: 6 **Article Number:** 064507 **DOI:** 10.1103/PhysRevB.83.064507 **Published:** FEB 15 2011

- **VORTEX AVALANCHES INDUCED BY SINGLE HIGH-FREQUENCY PULSES IN MgB(2) FILMS**
  Author(s): de Jesus Cuadra-Solis P.; Hernandez J. M.; Garcia-Santiago A.; et al. **Source:** JOURNAL OF SUPERCONDUCTIVITY AND NOVEL MAGNETISM **Volume:** 24 **Issue:** 1-2 **Pages:** 395-400 **DOI:** 10.1007/s10948-010-0946-y **Published:** JAN 2011

- **ASSESSMENT OF TERAHERTZ SPECTROSCOPY TO DETECT ANTIBIOTIC RESIDUES IN FOOD AND FEED MATRICES**
  Author(s): Redo-Sanchez Albert; Salvatella Gerard; Galceran Regina; et al. **Source:** ANALYST **Volume**: 136 **Issue:** 8 **Pages:** 1733-1738 **DOI:** 10.1039/c0an01016b **Published:** 2011

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  Author(s): Lendinez S.; Chudnovsky E. M.; Tejada J. **Source:** PHYSICAL REVIEW B **Volume:** 82 **Issue:** 17 **Article Number:** 174418 **DOI:** 10.1103/PhysRevB.82.174418 **Published:** NOV 12 2010

- **BLUE-GREEN TO NEAR-IR SWITCHING ELECTROLUMINESCENCE FROM Si-RICH SILICON OXIDE/NITRIDE BILAYER STRUCTURES**
  Author(s): Berencen Y.; Jambois O.; Ramirez J. M.; et al. **Source:** OPTICS LETTERS **Volume:** 36 **Issue:** 14 **Pages:** 2617-2619 **Published:** JUL 15 2011

- **THICKNESS-DEPENDENT OPTIMIZATION OF Er(3+) LIGHT EMISSION FROM SILICON-**

RICH SILICON OXIDE THIN FILMS
Author(s): Cueff Sebastien; Labbe Christophe; Jambois Olivier; et al. **Source:** NANOSCALE RESEARCH LETTERS **Volume:** 6 **Article Number:** 395 **DOI:** 10.1186/1556-276X-6-395 **Published:** MAY 25 2011

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  Author(s): Martinez-Boubeta C.; Martinez A.; Hernandez S.; et al. **Source:** SOLID STATE COMMUNICATIONS **Volume:** 151 **Issue:** 10 **Pages:** 751-753 **DOI:** 10.1016/j.ssc.2011.03.007 **Published:** MAY 2011

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  Author(s): G. Seguini1, S. Schamm-Chardon, P. Pellegrino, and M. Perego. **Source:** APPLIED PHYSICS LETTERS, **Published:** August 25 2011.

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  Author(s): Navarro-Urrios D.; Jambois O.; Lupi F. Ferrarese; et al. **Conference:** Spring Meeting of the European-Materials-Research-**Society Location:** Strasbourg, FRANCE **Date:** JUN 07-11, 2010 **Sponsor(s):** European Mat Res Soc **Source:** OPTICAL MATERIALS **Volume:** 33 **Issue:** 7 **Special Issue:** Yes **Pages:** 1086-1090 **DOI:** 10.1016/j.optmat.2010.12.003 **Published:** MAY 2011

- **DISTINCT MAGNETISM IN ULTRATHIN EPITAXIAL NiFe(2)O(4) FILMS ON MgAl(2)O(4) AND SrTiO(3) SINGLE CRYSTALLINE SUBSTRATES**
  Author(s): Foerster Michael; Manuel Rebled Jose; Estrade Sonia; et al. **Source:** PHYSICAL REVIEW B **Volume:** 84 **Issue:** 14 **Article Number:** 144422 **DOI:** 10.1103/PhysRevB.84.144422 **Published:** OCT 20 2011

- **HIGH QUALITY InAlN SINGLE LAYERS LATTICE-MATCHED TO GAN GROWN BY MOLECULAR BEAM EPITAXY**
  Author(s): Gacevic Z.; Fernandez-Garrido S.; Rebled J. M.; et al. **Source:** APPLIED PHYSICS LETTERS **Volume:** 99 **Issue:** 3 **Article Number:** 031103 **DOI:** 10.1063/1.3614434 **Published:** JUL 18 2011

- **EFFECTIVENESS OF NITROGEN INCORPORATION TO ENHANCE THE PHOTOELECTROCHEMICAL ACTIVITY OF NANOSTRUCTURED TiO(2): NH(3) VERSUS H(2)-N(2) ANNEALING**
  Author(s): Fabrega Cristian; Andreu Teresa; Güell Frank; et al. **Source:** NANOTECHNOLOGY **Volume:** 22 **Issue:** 23 **Article Number:** 235403 **DOI:** 10.1088/0957-4484/22/23/235403 **Published:** JUN 10 2011

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  Author(s): Tarancon A.; Morata A.; Peiro F.; et al. **Conference:** Workshop on Solid Oxide Fuel Cells (SOFCs) **Location:** Albacete, SPAIN **Date:** NOV 18-20, 2009 **Sponsor(s):** Univ, Castilla La Mancha, Inst Renewable Energy **Source:** FUEL CELLS **Volume:** 11 **Issue:** 1 **Special Issue:** Yes **Pages**: 26-37 **DOI:** 10.1002/fuce.201000065 **Published:** FEB 2011

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  Author(s): Heiss Martin; Conesa-Boj Sonia; Ren Jun; et al. **Source:** PHYSICAL REVIEW B **Volume:** 83 **Issue:** 4 **Article Number:** 045303 **DOI:** 10.1103/PhysRevB.83.045303 **Published:** JAN 20 2011

- **SUBSTRATE EFFECTS ON THE STRUCTURAL AND PHOTORESPONSE PROPERTIES OF CVD GROWN ZnO NANOSTRUCTURES: ALUMINA vs. SILICA**
  Author(s): Alarcon-Llado Esther; Estrade Sonia; Daniel Prades Joan; et al. **Source:** CRYSTENGCOMM **Volume:** 13 **Issue:** 2 **Pages:** 656-662 **DOI:** 10.1039/c0ce00196a **Published:** 2011

- **LONG-RANGE ORDER OF Ni(2+) AND Mn(4+) AND FERROMAGNETISM IN MULTIFERROIC (Bi(0.9)La(0.1))(2)NiMnO(6) THIN FILMS**
  Author(s): Langenberg E.; Rebled J.; Estrade S.; et al. **Source:** JOURNAL OF APPLIED PHYSICS **Volume:** 108 **Issue:** 12 **Article Number:** 123907 **DOI:** 10.1063/1.3524278 **Published:** DEC 15 2010

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  Author(s): Gacevic Z.; Fernandez-Garrido S.; Hosseini D.; et al. **Source:** JOURNAL OF APPLIED PHYSICS **Volume:** 108 **Issue:** 11 **Article Number:** 113117 **DOI:** 10.1063/1.3517138 **Published:** DEC 1 2010

- **SUBSTRATE EFFECTS ON THE STRUCTURAL AND PHOTORESPONSE PROPERTIES OF CVD GROWN ZnO NANOSTRUCTURES: ALUMINA vs. SILICA**
  Author(s): Alarcon-Llado Esther; Estrade Sonia; Daniel Prades Joan; et al. **Source:** CRYSTENGCOMM **Volume:** 13 **Issue:** 2 **Pages:** 656-662 **DOI:** 10.1039/c0ce00196a **Published:** 2011

- **NONTUNNEL TRANSPORT THROUGH CoFe(2)O(4) NANOMETRIC BARRIERS**

Author(s): Foerster M.; Gutierrez D. F.; Rigato F.; et al. **Source:** APPLIED PHYSICS LETTERS **Volume:** 97 **Issue:** 24 **Article Number:** 242508 **DOI:** 10.1063/1.3527921 **Published:** DEC 13 2010

- **ERBIUM IMPLANTED SILICON RICH OXIDE THIN FILMS SUITABLE FOR SLOT WAVEGUIDES APPLICATIONS**
  Author(s): Prtljaga Nikola; Navarro-Urrios Daniel; Marconi Alessandro; et al. **Conference:** Spring Meeting of the European-Materials-Research-Society **Location:** Strasbourg, FRANCE **Date:** JUN 07-11, 2010 **Sponsor(s):** European Mat Res Soc

- **EFFECTS OF THE THICKNESS ON THE PROPERTIES OF ERBIUM-DOPED SILICON-RICH SILICON OXIDE THIN FILMS**
  Author(s): Cueff S.; Labbeacute C.; Cardin J.; et al. **Source:** PHYSICA STATUS SOLIDI C **Volume:** 8 **Issue:** 3 **Pages:** 1027-32 **DOI:** 10.1002/pssc.201000390 **Published:** March 2011

- **OPTICALLY ACTIVE SUBSTOICHIOMETRIC Si 3N 4 MU-CAVITIES**
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  Author(s): Barreto J.; Morales A.; Peraacutelvarez M.; et al. **Source:** PHYSICA STATUS SOLIDI C **Volume:** 8 **Issue:** 3 **Pages:** 168-71 **DOI:** 10.1002/pssc.201000363 **Published:** March 2011

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  Author(s): Martiacutenez A.; Hernaacutendez S.; Pellegrino P.; et al. **Source:** PHYSICA STATUS SOLIDI C **Volume:** 8 **Issue:** 3 **Pages:** 969-73 **DOI:** 10.1002/pssc.201000420 **Published:** March 2011

- **MIRROR SYMMETRY IN MAGNETIZATION REVERSAL AND COEXISTENCE OF POSITIVE AND NEGATIVE EXCHANGE BIAS IN Ni/FeF(2)**
  Author(s): Kovylina M.; Erekhinsky M.; Morales R.; et al. **Source:** APPLIED PHYSICS LETTERS **Volume:** 98 **Issue:** 15 **Article Number:** 152507 **DOI:** 10.1063/1.3577648 **Published:** APR 11 2011

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  Author(s): Batlle Xavier; Perez N.; Guardia P.; et al. **Conference:** 55th Annual Conference on Magnetism and Magnetic Materials **Location:** Atlanta, GA **Date:** NOV, 2010 **Source:** JOURNAL OF APPLIED PHYSICS **Volume:** 109 **Issue:** 7 **Article Number:** 07B524 **DOI:** 10.1063/1.3559504 **Published:** APR 1 2011

- **TUNING THE SIZE, THE SHAPE, AND THE MAGNETIC PROPERTIES OF IRON OXIDE NANOPARTICLES**

Author(s): Guardia Pablo; Labarta Amilcar; Batlle Xavier **Source:** JOURNAL OF PHYSICAL CHEMISTRY C **Volume:** 115 **Issue:** 2 **Pages:** 390-396 **DOI:** 10.1021/jp1084982 **Published:** JAN 20 2011

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  Author(s): Perez Nicolas; Lopez-Calahorra Francisco; Labarta Amilcar; et **Source:** PHYSICAL CHEMISTRY CHEMICAL PHYSICS **Volume:** 13 **Issue:** 43 **Pages:** 19485-19489 **DOI:** 10.1039/c1cp20457b **Published:** 2011

- **GRIFFITHS-LIKE PHASE AND MAGNETIC CORRELATIONS AT HIGH FIELDS IN Gd(5) Ge(4)**
  Author(s): Perez Nicolas; Casanova Felix; Bartolome Fernando; et al. **Source**: PHYSICAL REVIEW B **Volume**: 83 **Issue**: 18 **Article Number**: 184411 **DOI**: 10.1103/PhysRevB.83.184411 **Published**: MAY 17 2011 **Times Cited:** 0 (from Web of Science)

- **MORPHOLOGY INFLUENCE ON NANOSCALE MAGNETISM OF Co NANOPARTICLES: EXPERIMENTAL AND THEORETICAL ASPECTS OF EXCHANGE BIAS**
  Author(s): Simeonidis K.; Martinez-Boubeta C.; Iglesias O.; et al. **Source**: PHYSICAL REVIEW B **Volume**: 84 **Issue**: 14 **Article Number**: 144430 **DOI**: 10.1103/PhysRevB.84.144430 **Published**: OCT 31 2011

- **SHIFTED LOOPS AND COERCIVITY FROM FIELD-IMPRINTED HIGH-ENERGY BARRIERS IN FERRITIN AND FERRIHYDRITE NANOPARTICLES**
  Author(s): Silva N. J. O.; Amaral V. S.; Urtizberea A.; et al. **Source**: PHYSICAL REVIEW B **Volume**: 84 **Issue**: 10 **Article Number**: 104427 **DOI**: 10.1103/PhysRevB.84.104427 **Published**: SEP 15 2011

- **PSEUDOCRITICAL BEHAVIOR OF FERROMAGNETIC PURE AND RANDOM DILUTED NANOPARTICLES WITH COMPETING INTERACTIONS: VARIATIONAL AND MONTE CARLO APPROACHES**
  Author(s): Velasquez E. A.; Mazo-Zuluaga J.; Restrepo J.; et al. **Source**: PHYSICAL REVIEW B **Volume**: 83 **Issue**: 18 **Article Number**: 184432 **DOI**: 10.1103/PhysRevB.83.184432 **Published**: MAY 27 2011

NANOSTRUCTURED MATERIALS

- **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

- **CoPt NANOSCALE STRUCTURES WITH DIFFERENT GEOMETRY PREPARED BY ELECTRODEPOSITION FOR MODULATION OF THEIR MAGNETIC PROPERTIES**
  Author(s): Cortes M.; Serra A.; Gomez E.; et al. **Source:** ELECTROCHIMICA ACTA **Volume:** 56 **Issue:** 24 **Pages:** 8232-8238 **DOI:** 10.1016/j.electacta.2011.06.069 **Published:** OCT 1 2011

- **NANOCRYSTALLINE CoP COATINGS PREPARED BY DIFFERENT ELECTRODEPOSITION TECHNIQUES**
  Author(s): Kosta I.; Valles E.; Gomez E.; et al. **Source:** MATERIALS LETTERS **Volume:** 65 **Issue:** 19-20 **Pages:** 2849-2851 **DOI:** 10.1016/j.matlet.2011.06.026 **Published:** OCT 2011

- **NANOWIRES OF NiCo/BARIUM FERRITE MAGNETIC COMPOSITE BY ELECTRODEPOSITION** **Author(s)**: Cojocaru P.; Magagnin L.; Gomez E.; et al. **Source:** MATERIALS LETTERS **Volume:** 65 **Issue:** 17-18 **Pages:** 2765-2768 **DOI:** 10.1016/j.matlet.2011.05.085 **Published:** SEP 2011

- **ELECTRODEPOSITION OF Co, Sm AND SmCo FROM A DEEP EUTECTIC SOLVENT**
  Author(s): Gomez E.; Cojocaru P.; Magagnin L.; et al. **Source:** JOURNAL OF ELECTROANALYTICAL CHEMISTRY **Volume:** 658 **Issue:** 1-2 **Pages:** 18-24 **DOI:** 10.1016/j.jelechem.2011.04.015 **Published:** JUL 15 2011

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  Author(s): Cojocaru P.; Magagnin L.; Gomez E.; et al. **Source:** TRANSACTIONS OF THE INSTITUTE OF METAL FINISHING **Volume:** 89 **Issue:** 4 **Pages:** 194-197 **DOI:** 10.1179/174591911X 13070182402644 **Published:** JUL 2011

- **GIANT MAGNETORESISTANCE IN ELECTRODEPOSITED Co-Ag GRANULAR FILMS**
  Author(s): Garcia-Torres Jose; Valles Elisa; Gomez Elvira **Source:** MATERIALS LETTERS **Volume:** 65 **Issue:** 12 **Pages:** 1865-1867 **DOI:** 10.1016/j.matlet.2011.03.077 **Published:** JUN 30 2011

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  Author(s): Cortes M.; Gomez E.; Sadler J.; et al. **Source:** ELECTROCHIMICA ACTA **Volume:** 56 **Issue:** 11 **Pages:** 4087-4091 **DOI:** 10.1016/j.electacta.2011.01.117 **Published:** APR 15 2011

- **ELECTROCHEMICAL PREPARATION AND MAGNETIC PROPERTIES OF SUBMICROMETRIC CORE-SHELL COPT-CONI PARTICLES**
  Author(s): Cortes M.; Gomez E.; Valles E. **Source:** JOURNAL OF ELECTROANALYTICAL CHEMISTRY **Volume:** 650 **Issue:** 1 **Pages:** 36-40 **DOI:** 10.1016/j.jelechem.2010.09.010 **Publi-**

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Author(s): Cojocaru P.; Magagnin L.; Gomez E.; et al. **Source:** JOURNAL OF MICROMECHANICS AND MICROENGINEERING **Volume:** 20 **Issue:** 12 Article Number: 125017 **DOI:** 10.1088/0960-1317/20/12/125017 **Published:** DEC 2010

MAGNETIC PROPERTIES OF NANOCRYSTALLINE CoPt ELECTRODEPOSITED FILMS. INFLUENCE OF P INCORPORATION

Author(s): Cortes Meritxell; Gomez Elvira; Valles Elisa **Conference:** 10th Annual Meeting on Advanced Batteries and Accumulatos (ABA-10) **Location:** Brno, CZECH REPUBLIC **Date:** 2009 **Sponsor(s):** Brno Tech Univ, Fac Elect Engn & Commun Technolog **Source:** JOURNAL OF SOLID STATE ELECTROCHEMISTRY **Volume:** 14 **Issue:** 12 **Pages:** 2225-2233 **DOI:** 10.1007/s10008-010-1055-3 **Published:** DEC 2010

TEMPERATURE DEPENDENCE OF GMR AND EFFECT OF ANNEALING ON ELECTRODEPOSITED Co-Ag GRANULAR FILMS

Author(s): Garcia-Torres Jose; Valles Elisa; Gomez Elvira **Source:** JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS **Volume:** 322 **Issue:** 20 **Pages:** 3186-3191 **DOI:** 10.1016/j.jmmm.2010.05.058 **Published:** OCT 2010

MODIFYING SURFACE PROPERTIES OF DIAMOND-LIKE CARBON FILMS VIA NANOTEXTURING

Author(s): Corbella C.; Portal-Marco S.; Rubio-Roy M.; et al. **Source:** JOURNAL OF PHYSICS D-APPLIED PHYSICS **Volume:** 44 **Issue:** 39 **Article Number:** 395301 **DOI:** 10.1088/0022-3727/44/39/395301 **Published:** OCT 5 2011

DETECTION AND CHARACTERIZATION OF SINGLE NANOPARTICLES BY INTERFEROMETRIC PHASE MODULATED ELLIPSOMETRY

Author(s): Barroso F.; Bosch S.; Tort N.; et al. **Conference:** 5th International Conference on Spectroscopic Ellipsometry **Location:** Univ Albany, Coll Nanoscale & Engn, Albany, NY **Date:** MAY 23-29, 2010 **Source:** THIN SOLID FILMS **Volume:** 519 **Issue:** 9 Special **Issue:** SI **Pages:** 2801-2805 **DOI:** 10.1016/j.tsf.2010.12.051 **Published:** FEB 28 2011

CHIRALITY GENERATED BY FLOWS IN PSEUDOCYANINE DYE J-AGGREGATES: REVISITING 40 YEARS OLD REPORTS

Author(s): El-Hachemi Zoubir; Arteaga Oriol; Canillas Adolf; et al. **Source:** CHIRALITY **Volume:** 23 **Issue:** 8 **Pages:** 585-592 **DOI:** 10.1002/chir.20975 **Published:** SEP 2011

TRANSMISSION MUELLER MATRIX ELLIPSOMETRY OF CHIRALITY SWITCHING PHENOMENA

Author(s): Arteaga Oriol; El-Hachemi Zoubir; Canillas Adolf; et al. **Conference:** 5th International

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- **EMERGENCE OF SUPRAMOLECULAR CHIRALITY BY FLOWS**
  Author(s): Arteaga Oriol; Canillas Adolf; Crusats Joaquim; et al. **Source:** CHEMPHYSCHEM **Volume:** 11 **Issue:** 16 **Pages:** 3511-3516 **DOI:** 10.1002/cphc.201000658 **Published:** NOV 15 2010

- **ANALYTIC INVERSION OF THE MUELLER-JONES POLARIZATION MATRICES FOR HOMOGENEOUS MEDIA**
  Author(s): Arteaga Oriol; Canillas Adolf **Source:** OPTICS LETTERS **Volume:** 35 **Issue:** 20 **Pages:** 3525-3525 **Published:** OCT 15 2010

- **HEALING OF DEFECTS AT THE INTERFACE OF NEMATIC LIQUID CRYSTALS AND STRUCTURED LANGMUIR-BLODGETT MONOLAYERS**
  Author(s): Petit-Garrido Nuria; Trivedi Rahul P.; Ignes-Mullol Jordi; et al. **Source:** PHYSICAL REVIEW LETTERS **Volume:** 107 **Issue:** 17 **Article Number:** 177801 **DOI:** 10.1103/PhysRevLett.107.177801 **Published:** OCT 17 2011

- **INFLUENCE OF INITIAL COMPOSITION CHANGES CAUSED BY UV AND GAMMA IRRADIATION ON WAVE PROPAGATION IN THE BELOUSOV-ZHABOTINSKY REACTION**
  Author(s): Castillo-Rojas S.; Ignes-Mullol J.; Sagues F. **Source:** CHEMICAL PHYSICS LETTERS **Volume:** 504 **Issue:** 4-6 **Pages:** 162-164 **DOI:** 10.1016/j.cplett.2011.02.009 **Published:** MAR 10 2011

- **BREAKING THE DEGENERACY OF NEMATIC LIQUID CRYSTALS BY MEANS OF ACTUATED ANISOMETRIC PARAMAGNETIC COLLOIDS**
  Author(s): Hernandez-Navarro S.; Tierno P.; Ignes-Mullol J.; et al. **Source:** SOFT MATTER **Volume:** 7 **Issue:** 11 **Pages:** 5109-5112 **DOI:** 10.1039/c1sm05385j **Published:** 2011

- **THERMODYNAMICS AND MESOSCOPIC ORGANISATION IN LANGMUIR MONOLAYERS OF AN AZOBENZENE DERIVATIVE** **Author(s)**: Pulido-Companys A.; Ignes-Mullol J. **Source:** JOURNAL OF COLLOID AND INTERFACE SCIENCE **Volume:** 352 **Issue:** 2 **Pages:** 449-455 **DOI:** 10.1016/j.jcis.2010.08.084 **Published:** DEC 15 2010

- **SUPPORTED IONIC LIQUID PHASE CONTAINING PALLADIUM NANOPARTICLES ON FUNCTIONALIZED MULTIWALLED CARBON NANOTUBES: CATALYTIC MATERIALS FOR SEQUENTIAL HECK COUPLING/HYDROGENATION PROCESS**
  Author(s): Rodriguez-Perez Laura; Pradel Christian; Serp Philippe; et al. **Source:** CHEMCATCHEM **Volume:** 3 **Issue:** 4 **Pages:** 749-754 **DOI:** 10.1002/cctc.201000321 **Published:** APR 2011

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  Author(s): Jahjah Mohamad; Kihn Yolande; Teuma Emmanuelle; et al. **Source:** JOURNAL OF MOLECULAR CATALYSIS A-CHEMICAL **Volume:** 332 **Issue:** 1-2 **Pages:** 106-112 **DOI:** 10.1016/j.molcata.2010.09.006 **Published:** NOV 1 2010

NANOENERGY: PRODUCTION, STORAGE, AND ENVIRONMENT

DETERMINATION OF HARDNESS, YOUNG'S MODULUS AND FRACTURE TOUGHNESS OF LANTHANUM TUNGSTATES AS NOVEL PROTON CONDUCTORS

Author(s): Roa J. J.; Magraso A.; Morales M.; et al. **Source:** CERAMICS INTERNATIONAL **Volume:** 37 **Issue:** 5 **Pages:** 1593-1599 **DOI:** 10.1016/j.ceramint.2011.01.002 **Published:** JUL 2011

STUDY OF THE FRICTION, ADHESION AND MECHANICAL PROPERTIES OF SINGLE CRYSTALS, CERAMICS AND CERAMIC COATINGS BY AFM

Author(s): Roa J. J.; Oncins G.; Diaz J.; et al. **Source:** JOURNAL OF THE EUROPEAN CERAMIC SOCIETY **Volume:** 31 **Issue:** 4 **Pages:** 429-449 **DOI:** 10.1016/j.jeurceramsoc.2010.10.023 **Published:** APR 2011

NANOINDENTATION OF MULTILAYERED EPITAXIAL YBa(2)Cu(3)O(7-DELTA) THIN FILMS AND COATED CONDUCTORS

Author(s): Roa J. J.; Jimenez-Pique E.; Puig T.; et al. **Source:** THIN SOLID FILMS **Volume:** 519 **Issue:** 8 **Pages:** 2470-2476 **DOI:** 10.1016/j.tsf.2010.12.101 **Published:** FEB 1 2011

ANODE-SUPPORTED SOFC OPERATED UNDER SINGLE-CHAMBER CONDITIONS AT INTERMEDIATE TEMPERATURES

Author(s): Morales M.; Roa J. J.; Capdevila X. G.; et al. **Conference:** Workshop on Solid Oxide Fuel Cells (SOFCs) **Location:** Albacete, SPAIN **Date:** NOV 18-20, 2009 **Sponsor(s):** Univ, Castilla La Mancha, Inst Renewable Energy **Source:** FUEL CELLS **Volume:** 11 **Issue:** 1 **Special Issue:** Yes **Pages:** 108-115 **DOI:** 10.1002/fuce.201000063 **Published:** FEB 2011

MECHANICAL CHARACTERISATION AT NANOMETRIC SCALE OF A NEW DESIGN OF SOFCs

Author(s): Roa J. J.; Ruiz-Morales J. C.; Canales-Vazquez J.; et al. **Conference:** Workshop on Solid Oxide Fuel Cells (SOFCs) **Location:** Albacete, SPAIN **Date:** NOV 18-20, 2009 **Sponsor(s):** Univ, Castilla La Mancha, Inst Renewable Energy **Source:** FUEL CELLS **Volume:** 11 **Issue:** 1 **Special Issue:** Yes **Pages:** 124-130 **DOI:** 10.1002/fuce.201000047 **Published:** FEB 2011

MECHANICAL PROPERTIES AT THE NANOMETRIC SCALE OF GDC AND YSZ USED AS ELECTROLYTES FOR SOLID OXIDE FUEL CELLS

Author(s): Morales M.; Roa J. J.; Capdevila X. G.; et al. **Source:** ACTA MATERIALIA **Volume:** 59 **Issue:** 3 **Pages:** 1318-1318 **DOI:** 10.1016/j.actamat.2010.10.043 **Published:** FEB 2011

CALCULATION OF YOUNG'S MODULUS VALUE BY MEANS OF AFM

Author(s): Roa J. J.; Oncins G.; Diaz J.; et al. **Source:** RECENT PATENTS ON NANOTECHNOLOGY **Volume:** 5 **Issue:** 1 **Pages:** 27-36 **Published:** JAN 2011

CATION ORDER ENHANCEMENT IN Sr(2)FeMoO(6) BY WATER-SATURATED HYDROGEN REDUCTION

Author(s): Calleja Alberto; Capdevila Xavier G.; Segarra Merce; et al. **Source:** JOURNAL OF THE

EUROPEAN CERAMIC SOCIETY **Volume:** 31 **Issue:** 1-2 **Pages:** 121-127 **DOI:** 10.1016/j.jeurceramsoc.2010.08.002 **Published:** JAN-FEB 2011

- **MECHANICAL PROPERTIES AND PLASTIC BEHAVIOUR MECHANISM INDUCED BY NANOINDENTATION TECHNIQUE OF YSZ AND GDC MATERIALS USED AS ELECTROLYTES IN FUEL CELLS DEVICES**
  Author(s): Roa J. J.; Morales M.; Segarra M. **Source:** JOURNAL OF NEW MATERIALS FOR ELECTROCHEMICAL SYSTEMS **Volume:** 13 **Issue:** 4 **Pages:** 327-332 **Published:** OCT 2010

- **SELECTION OF MATERIALS WITH POTENTIAL IN SENSIBLE THERMAL ENERGY STORAGE**
  Author(s): Fernandez A. I.; Martinez M.; Segarra M.; et al. **Source:** SOLAR ENERGY MATERIALS AND SOLAR CELLS **Volume:** 94 **Issue:** 10 **Pages:** 1723-1729 **DOI:** 10.1016/j.solmat.2010.05.035 **Published:** OCT 2010

- **CARRIER CONFINEMENT IN GaN/aL(X)Ga(1-X)N 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

- **IMPROVEMENT OF OXYGEN STORAGE CAPACITY USING MESOPOROUS CERIA-ZIRCONIA SOLID SOLUTIONS**
  Author(s): Abdollahzadeh-Ghom Sara; Zamani Cyrus; Andreu Teresa; et al. **Source:** APPLIED CATALYSIS B-ENVIRONMENTAL **Volume:** 108 **Issue:** 1-2 **Pages:** 32-38 **DOI:** 10.1016/j.apcatb.2011.07.038 **Published:** OCT 11 2011

- **CONTROL OF THE DOPING CONCENTRATION, MORPHOLOGY AND OPTOELECTRONIC PROPERTIES OF VERTICALLY ALIGNED CHLORINE-DOPED ZnO NANOWIRES**
  Author(s): Fan Jiandong; Shavel Alexey; Zamani Reza; et al. **Source:** ACTA MATERIALIA **Volume:** 59 **Issue:** 17 **Pages:** 6790-6800 **DOI:** 10.1016/j.actamat.2011.07.037 **Published:** OCT 2011

- **CHARACTERIZATION OF INDIVIDUAL BARIUM TITANATE NANORODS AND THEIR ASSESSMENT AS BUILDING BLOCKS OF NEW CIRCUIT ARCHITECTURES**
  Author(s): Zagar Kristina; Hernandez-Ramirez Francisco; Daniel Prades Joan; et al. **Source:** NANOTECHNOLOGY **Volume:** 22 **Issue:** 38 **Article Number:** 385501 **DOI:** 10.1088/0957-4484/22/38/385501 **Published:** SEP 23 2011

- **THREE-DIMENSIONAL MULTIPLE-ORDER TWINNING OF SELF-CATALYZED GaAS NANOWIRES ON Si SUBSTRATES**
  Author(s): Uccelli Emanuele; Arbiol Jordi; Magen Cesar; et al. **Source:** NANO LETTERS **Volume:** 11 **Issue:** 9 **Pages:** 3827-3832 **DOI:** 10.1021/nl201902w **Published:** SEP 2011

- **RAMAN SCATTERING ANALYSIS OF Cu-POOR Cu(In,Ga)Se(2) CELLS FABRICATED ON POLYIMIDE SUBSTRATES: EFFECT OF Na CONTENT ON MICROSTRUCTURE AND PHASE STRUCTURE**
  Author(s): Izquierdo-Roca V.; Caballero R.; Fontane X.; et al. **Source:** THIN SOLID FILMS **Volume:** 519 **Issue:** 21 **Special Issue:** Yes **Pages:** 7300-7303 **DOI:** 10.1016/j.tsf.2010.12.177 **Published:** AUG 31 2011

- **SYNTHESIS AND SENSING PROPERTIES OF SnO(2) THIN FILMS OBTAINED BY CONDENSED VAPORS DEPOSITION**
  Author(s): Melendrez M. F.; Cardenas G.; Vargas-Hernandez C.; et al. **Source:** SENSOR LETTERS **Volume:** 9 **Issue:** 4 **Pages:** 1282-1291 **DOI:** 10.1166/sl.2011.1691 **Published:** AUG 2011

- **CORRECTION TO GROWTH KINETICS OF ASYMMETRIC Bi(2)S(3) NANOCRYSTALS: SIZE DISTRIBUTION FOCUSING IN NANORODS**
  Author(s): Ibanez Maria; Guardia Pablo; Shavel Alexey; et al. **Source:** JOURNAL OF PHYSICAL CHEMISTRY C **Volume:** 115 **Issue:** 23 **Pages:** 11888-11888 **DOI:** 10.1021/jp204009r **Published:** JUN 16 2011

- **EFFECTIVENESS OF NITROGEN INCORPORATION TO ENHANCE THE PHOTOELECTROCHEMICAL ACTIVITY OF NANOSTRUCTURED TiO(2):NH(3) VERSUS H(2)-N(2) ANNEALING**
  Author(s): Fabrega Cristian; Andreu Teresa; Gueell Frank; et al. **Source:** NANOTECHNOLOGY **Volume:** 22 **Issue:** 23 **Article Number:** 235403 **DOI:** 10.1088/0957-4484/22/23/235403 **Published:** JUN 10 2011

- **In(Ga)AS QUANTUM DOT FORMATION ON GROUP-III ASSISTED CATALYST-FREE InGaAs NANOWIRES**
  Author(s): Heiss Martin; Ketterer Bernt; Uccelli Emanuele; et al. **Source:** NANOTECHNOLOGY **Volume:** 22 **Issue:** 19 **Article Number:** 195601 **DOI:** 10.1088/0957-4484/22/19/195601 **Published:** MAY 13 2011

- **IN-DEPTH RESOLVED RAMAN SCATTERING ANALYSIS FOR THE IDENTIFICATION OF SECONDARY PHASES: CHARACTERIZATION OF Cu(2)ZnSnS(4) LAYERS FOR SOLAR CELL APPLICATIONS**
  Author(s): Fontane X.; Calvo-Barrio L.; Izquierdo-Roca V.; et al. **Source:** APPLIED PHYSICS LETTERS **Volume:** 98 **Issue:** 18 **Article Number:** 181905 **DOI:** 10.1063/1.3587614 **Published:** MAY 2 2011

- **ASSESSMENT OF ABSORBER COMPOSITION AND NANOCRYSTALLINE PHASES IN CuInS(2) BASED PHOTOVOLTAIC TECHNOLOGIES BY EX-SITU/IN-SITU RESONANT RAMAN SCATTERING MEASUREMENTS**
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nical Conference Thin Film 2010 (PVTC 2010) **Location:** Aix en Provence, FRANCE **Date:** MAY 27-28, 2010 **Source:** SOLAR ENERGY MATERIALS AND SOLAR CELLS **Volume:** 95 **Special Issue:** Yes **Supplement:** 1 **Pages:** S83-S88 **DOI:** 10.1016/j.solmat.2010.11.014 **Published:** MAY 2011

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  Author(s): Heiss Martin; Conesa-Boj Sonia; Ren Jun; et al. **Source:** PHYSICAL REVIEW B **Volume:** 83 **Issue:** 4 **Article Number:** 045303 **DOI:** 10.1103/PhysRevB.83.045303 **Published:** JAN 20 2011

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  Author(s): Izquierdo-Roca Victor; Fontane Xavier; Saucedo Edgardo; et al. **Source:** NEW JOURNAL OF CHEMISTRY **Volume:** 35 **Issue:** 2 **Pages:** 453-460 **DOI:** 10.1039/c0nj00794c **Published:** 2011

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  Author(s): Hernandez-Ramirez Francisco; Daniel Prades Juan; Hackner Angelika; et al.**Source:** NANOSCALE **Volume:** 3 **Issue:** 2 **Pages:** 630-634 **DOI:** 10.1039/c0nr00528b **Published:** 2011

- **SUBSTRATE EFFECTS ON THE STRUCTURAL AND PHOTORESPONSE PROPERTIES OF CVD GROWN ZnO NANOSTRUCTURES: ALUMINA vs. SILICA**
  Author(s): Alarcon-Llado Esther; Estrade Sonia; Daniel Prades Joan; et al. **Source:** CRYSTEN-

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- **QUANTITATIVE ANALYSIS OF CO-HUMIDITY GAS MIXTURES WITH SELF-HEATED NANOWIRES OPERATED IN PULSED MODE**
  Author(s): Prades J. D.; Hernandez-Ramirez F.; Fischer T.; et al. **Source:** APPLIED PHYSICS LETTERS **Volume:** 97 **Issue:** 24 **Article Number:** 243105 **DOI:** 10.1063/1.3515918 **Published:** DEC 13 2010

- **CRYSTALLIZATION PATHWAYS OF MULTICOMPONENT OXIDE NANOCRYSTALS CRITICAL ROLE OF THE METAL CATIONS DISTRIBUTION IN THE CASE STUDY OF METAL FERRITES**
  Author(s): Epifani Mauro; Arbiol Jordi; Andreu Teresa; et al. **Source:** CRYSTAL GROWTH & DESIGN **Volume:** 10 **Issue:** 12 **Pages:** 5176-5181 **DOI:** 10.1021/cg100959j **Published:** DEC 2010

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  Author(s): Fabrega Cristian; Hernandez-Ramirez Francisco; Daniel Prades Joan; et al. **Source:** NANOTECHNOLOGY **Volume:** 21 **Issue:** 44 **Article Number:** 445703 **DOI:** 10.1088/0957-4484/21/44/445703 **Published:** NOV 5 2010

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  Author(s): Barquinha Pedro; Pereira Luis; Goncalves Goncalo; et al. **Source:** JOURNAL OF THE SOCIETY FOR INFORMATION DISPLAY **Volume:** 18 **Issue:** 10 **Pages:** 762-772 **DOI:** 10.1889/JSID18.10.762 **Published:** OCT 2010

- **THE ELECTRONIC STRUCTURE OF CO-SPUTTERED ZINC INDIUM TIN OXIDE THIN FILMS**
  Author(s): Carreras Paz; Gutmann Sebastian; Antony Aldrin; et al. **Source:** JOURNAL OF APPLIED PHYSICS **Volume:** 110 **Issue:** 7 **Article Number:** 073711 **DOI:** 10.1063/1.3647780 **Published:** OCT 1 2011

HOT WIRE CONFIGURATION FOR DEPOSITING DEVICE GRADE NANO-CRYSTALLINE SILICON AT HIGH DEPOSITION RATE

Author(s): Nos O.; Frigeri P. A.; Bertomeu J. **Conference:** 6th International Conference on Hot-Wire CVD (CAT-CVD) Process **Location:** Palaiseau, FRANCE **Date:** SEP 13-17, 2010 **Sponsor(s):** Ecole Polytech ParisTech; CNRS-INSIS; Forschungszentrum Julich; Fraunhofer IST; GVD Corp; Gifu Univ, Ctr Innovat Photovolt Systems; ULVAC Inc; Mat Design Factory Co Ltd; Top Macoat Co Ltd; Universal Systems Co Ltd **Source:** THIN SOLID FILMS **Volume:** 519 **Issue:** 14 **Special Issue:** Yes **Pages:** 4531-4534 **DOI:** 10.1016/j.tsf.2011.01.296 **Published:** MAY 2011

SINGLER-CHAMBER SOFCS BASED ON GADOLINIA DOPED CERIA OPERATED ON METHANE AND PROPANE

Author(s): Morales, M; Roa, JJ; Capdevila, XG, et al. **Conference Information:** IX National Meeting on Electroceramics, **Date:** JUN 28-30, 2009 **Location:** Univ Carlos III Madrid SPAIN **Source:** BOLETIN DE LA SOCIEDAD ESPANOLA DE CERAMICA Y VIDRIO **Volume:** 49 **Issue: Pages:** 67-74 **Published:** 2010 **Times Cited:** 0

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Author(s): Bartolome , E.; Roa, J.J.; Bozzo, B., et al. **Source:** Superconductor Science & Technology **Pages:** 045013 (6 pp.) **Published:** APRIL 2010

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PERFORMANCE OF A NOVEL TYPE OF ELECTROLYTE-SUPPORTED SOLID OXIDE FUEL CELL WITH HONEYCOMB STRUCTURE

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  Author(s): Choque, V; de la Piscina, PR; Molyneux, D, et al. **Conference Information:** 21st Ibero American Catalysis Symposium, **Date:** 2008 **Location:** Malaga SPAIN **Source:** CATALYSIS TODAY **Volume:** 149 **Issue:** 3-4 **Pages:** 248-253 **Published:** 2010 **Times Cited:** 0

- **INFLUENCE OF RF POWER ON THE PROPERTIES OF SPUTTERED ZnO:Al THIN FILMS**
  Author(s): Antony, A; Carreras, P; Keitzl, T, et al. Conference Information: Symposium on Advances in Transparent Electronics held at the 2009 EMRS Spring Meeting, **Date:** JUN 08-12, 2009 **Location:** Strasbourg FRANCE **Source:** PHYSICA STATUS SOLIDI A-APPLICATIONS AND MATERIALS SCIENCE **Volume:** 207 **Issue:** 7 **Pages:** 1577-1580 **Published:** 2010 **Times Cited:** 0

- **RELAXATION AND DERELAXATION OF PURE AND HYDROGENATED AMORPHOUS SILICON DURING THERMAL ANNEALING EXPERIMENTS**
  Author(s): Kail, F; Farjas, J; Roura, P, et al. **Source:** APPLIED PHYSICS LETTERS **Volume:** 97 **Issue:** 3 **Article Number:** 031918 **Published:** 2010 **Times Cited:** 0

- **RELAXATION AND DERELAXATION OF PURE AND HYDROGENATED AMORPHOUS SILICON DURING THERMAL ANNEALING EXPERIMENTS**
  Author(s): Kail, F.; Farjas, J.; Roura, P., et al. **Source:** APPLIED PHYSICS LETTERS **Pages:** 031918 (3 pp.) **Published:** 07 2010 19 July 2010

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LIST OF PATENTS

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Authors: Prades, J.D.; Hernandez-Ramirez, F.; Cirera, A.; Romano-Rodríguez A.; Morante, J.R.
Title: **Gas sensor, equipped with threadlike nanostructures, network of sensors and measurement method using said sensor (PCT num. PCT/EP2010/051206)** 2010

Authors: Prades, J.D.; Hernandez-Ramirez, F.; Morante, J.R.
Title: **Procedimiento de medida de las concentraciones de monóxido de carbono y humedad en un gas y sensor basado en nanoestructuras para llevarlo a cabo** 2010

Authors: Pedro Serra Coromina, Martí Duocastella Solà, Juan Marcos Fernández Pradas, José Luis Morenza Gil
Title: **Aparato y método para la impresión directa con láser** 2010

Authors: Farré, R.; Navajas, D.; Montserrat , J.M.
Title: **Dispositivo para generar una obstrucción de las vías respiratorias superiores en animales** 2010

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LIST OF MEMBERS

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Albalat Piñol, Rosa
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Almendros López, Isaac
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Andreu Batalle, Jordi
Andujar Bella, Jose Luis
Arimon Bedos, Muriel
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Bertran Serra, Enric
Borrell Hernandez, Jordi
Bulashenko Bulashenko, Oleg
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Busquets Viñas, M.Antonia
Caballero Briones, Felipe
Cajal Visa, Yolanda C.
Calpena Campmany, Ana Cristina
Calvo Barrio, Lorenzo
Canillas Biosca, Adolfo
Casademunt Viader, Jaume
Castan Vidal, Maria Teresa
Cirera Hernandez, Albert
Claret Bonet, Josep
Corbella Cordomi, Montserrat
Cornet Calveras, Albert
Corvera Poiré, Eugenia
D'enterria Adan, David
Diaz Gasa, M. Del Carmen
Diaz Lucea, M. Pilar
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Domenech Cabrera, Oscar
Egea Gras, M. Antonia
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Fernandez Tiburcio, Antonio
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Figuerola Silvestre, Albert
Fondevilla Sala, Nuria
Fraile Rodriguez, Arantxa
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Gallardo Roman, Oscar
Gallardo Sauret, Montserrat
Gamisans Linares, Fidencia
Garcia Capdevila, Javier
Garcia Celma, Maria Jose

Garcia Cespedes, Jordi
Garcia Del Muro Solans, Montserrat
Garcia Lopez, Maria Luisa
Garcia Santiago, Antoni
Garcia-Cuenca Varona, Maria Victoria
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Garrido Fernandez, Blas
Girona Brumos, Ma. Victoria
Gomez Simon, Montserrat
Gomez Valentin, Elvira
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Gordo Villoslada, Susana
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Gutierrez Gonzalez, Jose Maria
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Hernandez Ferras, Joan Manel
Hernandez Machado, Aurora
Hernandez Marquez, Sergio
Hernandez Ramirez, Francisco De P.
Herrera Corominas, Julia
Homs Marti, Narciso
Huguet Casades, Josep Maria
Ibañes Miguez, Marta
Iglesias Clotas, Oscar
Ignes Mullol, Jordi
Imperial Rodenas, Santiago
Izquierdo Roca, Victor
Kovylina, Miroslavna
Labarta Rodriguez, Amilcar Ramon
Latorre Tobia, Sonia
Lauroba Viladrosa, Jacinto
Lopez Calahorra, Francisco
Lousa Rodriguez, Arturo
Maestro Garriga, Alicia
Mayol Sanchez, Ricardo
Mañosa Carrera, Lluis
Mañosas Castejon, Maria
Mesquida Estevez, M. De Les Neus
Miguel Lopez, M. Del Carmen
Monfort Perearnau, Montserrat
Montero Barrientos, Maria Teresa
Morales Comas, Miguel
Morante Lleonart, Joan Ramon
Morenza Gil, Jose Luis
Morral Ruiz, Genoveva
Muller Jevenois, Carlos Maria
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Muñoz Alarcon, M. Teresa
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Navajas Navarro, Daniel
Nicolas Galindo, Ernesto
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Pastor Blasco, Fco.I.Javier
Peiro Martinez, Francisca
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Perez Garcia, M. Luisa

Perez Rodriguez, Alejandro
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Planes Vila, Antoni
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Sarret Pons, Maria
Segarra Rubi, Merce
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Serre , Christophe
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Tierno, Pietro
Torras Claveria, Laura
Valles Gimenez, Elisa
Valls Planells, Josep Oriol
Varela Fernandez, Manuel
Velasco Castrillo, Ma. Dolores
Vicente Castillo, Ramon
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Bonilla Valladares, Pablo

Borilovic , Ivana

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Camuñas Soler, Joan

Carbonell Cortes, Carla

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Cortes Francisco, Meritxell

Craig , Gavin

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Ferrarese Lupi, Federico

Hernandez Navarro, Sergi

Ibañez Jimenez, Anna

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Llusca Jane, Marta

Lopez Conesa, Luis

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Montanya Tanya, Nuria

Morales Suarez, Silvio Rene

Morrone , Luigi

Moya Alvarez, Carlos

Nos Aguila, Oriol

Nunes Rodrigues, Ana Mafalda

Penon Esteva, Josep Oriol

Petit Garrido, Nuria

Pou Raurell, Arnau

Pulido Companys, Alba

Ramírez Ramírez, Joan Manel

Rebled Corsellas, Jose Manuel

Rey Serra, Blanca

Rodriguez Abril, Sonia

Roig Roig, Ferran

Ruiz Caridad, Alicia

Sama Monsonis, Jordi

Suarez Germa, Maria Carme

Velasco Amigó, Verónica

Vescio , Giovanni

Martí i Franquès 1, 3rd floor, 08028 Barcelona

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

INSTITUT DE NANOCIÈNCIA I NANOTECNOLOGIA

Universitat de Barcelona
Martí i Franquès 1, 3rd floor
08028 Barcelona

B:KC Barcelona Knowledge Campus

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