IMB-CNM Instituto de Microelectrónica de Barcelona - Centro Nacional de Microelectrónica

Biennial Report

2007-2008

CSIC
Consejo Superior de Investigaciones Científicas

CNM
Centro Nacional de Microelectrónica
IMB

Contents

Foreword

Francesc Serra Mestres
Director *(until May 2008)*

The 2007-2008 time frame covered by this report is influenced, as it could not be otherwise, by a number of events and circumstances, which besides defining a specific contextual framework, have resulted in consequences of diverse sign when looked in detail, but clearly positive in global terms.

It is known that the activity of the center moves around R+D+i and is focused in the area of Micro and Nanosystems. The activities are developed by interacting with international and national entities of various dimensions, ranges and significances, such as the European Programs, the National Plan, the Ministries and the parent organization CSIC. In this framework and during this biennial period,

Competitiveness has grown in the calls for new European projects, and new instruments and possibilities have been developed (ERC, technology platforms, etc.)

The Ministry of which we depended through CSIC has changed to a Department (MICINN), which nominally seems more oriented to activities of innovation and interaction with industry.

Our parent organization, CSIC, has changed its legal structure to a State Agency, with the aim of finding solutions to the problems of lack of flexibility and lack of administrative dynamism, which hinder its activity.

Emilio Lora-Tamayo
Director *(from May 2008)*

The center has systematized and increased the activity related to the “open doors” policy of its facilities (especially the Clean Room) to external users, both National and European. The GIC-SERV program financed by MICINN has allowed the development of more than one hundred access projects, with technological success indexes greater than 90 %.

The center has enlarged the surface of its offices and laboratories by a 60 % and of the Clean Room by a 50 %. In parallel, a program for the renewal of equipment has been developed. Both projects have been directly financed by CSIC. The next year will see the conclusion of these initiatives and the beginning of their valorization, which will only be dependent on the essential increase of human resources that would allow an optimum exploitation of the new technological capabilities.

The halfway point of the Strategic Plan 2005-2009 has been crossed, with results above the proposed objectives.

In favour of it, in spite of it, because of it and as an evidence of it, the biennial report presented here is a good overview of the work that has been done in this framework.

Research highlights

GoodFood

Prof. Carles Cané coordinated the "GoodFood" *(Food safety and quality monitoring with microsystems)* Integrated Project of the 6th Framework Programme of the European Union. (FP6-IST-1-508744-IP; 2004-2007). The project involved 29 partners from 10 countries.

Epson project

IMB-CNM has developed a joint project with Seiko Epson Corp., Japan, on MEMS/NEMS resonators and bulk acoustic resonators (FBAR), including technology transfer (2003-2007).

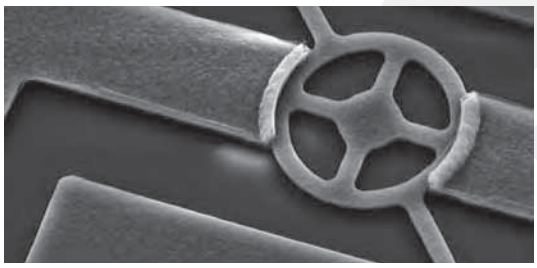
Invention award

Silver Medal awarded at the 36th International Exhibition of Inventions, Geneva 2008, to the patent "Digital Stereotaxic Biopsy System", by Manuel Lozano and Miguel Ullán from IMB-CNM plus two external researchers.

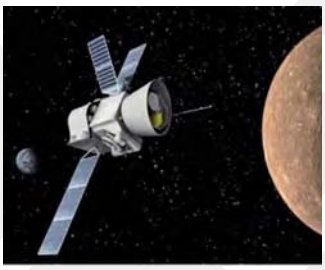
Power devices and systems

IMB-CNM is the leading partner of an ESA project for the design and fabrication of SiC high temperature blocking diodes for the solar arrays of the *BepiColombo* joint ESA and JAXA mission to Mercury, scheduled for launch in 2013.

GoodFood



Epson project



Power devices and systems

Other highlights in SiC technology and devices have been published in the following two papers:

Early stage formation of graphene on the C face of 6H-SiC, by N. Camara, G. Rius, J.-R. Huntzinger, A. Tiberj, L. Magaud, N. Mestres, P. Godignon, J. Camassel, Appl. Phys. Lett. 93 (2008) 263102.

Bipolar conduction impact on electrical characteristics and reliability of 1.2- and 3.5 kV 4H-SiC JBS diodes, by P. Brosselard, N. Camara, V. Banu, X. Jorda, M. Vellvehi, P. Godignon, J. Millan, Special Issue on SiC Devices, IEEE Trans. Electron Dev. 65 (2008) 1847-1856.

A novel approach to detect hot spots in active ICs and devices has been developed, based on sensing the heat flux generated by the hot-spot within the chip substrate with a probe-laser beam, which allows inspecting the chip through its lateral sides. It is described in:

X. Perpiñà, J. Altet, X. Jorda, M. Vellvehi, J. Millan, N. Mestres, Hot-spot detection in integrated circuits by substrate heat-flux sensing, IEEE Electron Dev. Lett. 29 (2008) 1142-1144.

The process technology for the fabrication of 50 A – 3.3 kV IGBTs with an active area of 1.3x1.3 cm^2 has been set-up at IMB-CNM Clean Room. Voltage and current sensors are included for reliability enhancement purposes. Features of the IGBT technology are described in:

Bi-IGBT- A low losses power structure by IGBT parallel association, by C. Caramel, R. De Maglie, P. Austin, J.L. Sanchez, J. Le Gal, E. Imbernon, J.P. Laur, D. Flores, S. Hidalgo, J. Millan, J. Rebollo, Semic. Sci. and Tech. (2008) 1-8.

The power devices and systems group organized the *7th European Conference on Silicon Carbide and Related Materials (ECSCRM'08)*, Barcelona, 7-11 Sept. 2008, with Prof. P. Godignon acting as General Chairman.

◆ (Bio)chemical sensors

The most relevant topics on (bio)sensor research rely on the development of integrated optochemical based biosensors, interdigitated electrode arrays for biosensing applications and nanoparticle based ultramicroelectrode arrays.

Three-dimensional interdigitated electrode array as a transducer for label-free biosensors, by A. Bratov, J. Ramon-Azcon, N. Abramova, A. Merlos, J. Adrian, F. Sánchez-Baeza, M.P. Marco, C. Dominguez, Biosensors & Bioelectronics, 24 (2008) 729-735.

Underpotential deposition-anodic stripping voltammetric detection of copper at gold nanoparticle-modified ultramicroelectrode arrays, by

Research highlights

J. Orozco, C. Fernández-Sánchez, C. Jiménez-Jorquera, Environmental Science & Technology, 42 (2008) 4877-4882.

Optical biosensor based on hollow integrated waveguides, by V.J. Cadarso, C. Fernández-Sánchez, A. Llobera, M. Darder, C. Domínguez, Anal. Chem. 80 (2008) 3498-3501.

Detection of Escherichia Coli and Salmonella Typhimurium using interdigitated microelectrode capacitive immunosensors: the importance of transducer geometry, by O. Laczka, E. Baldrich, F.J. Muñoz, F.J. Del Campo, Anal. Chem. 80 (2008) 7239-7247.

Full-field photonic biosensors based on tunable bio-doped sol–gel glasses, by A. Llobera, V.J. Cadarso, M. Darder, C. Domínguez, C. Fernández-Sánchez, Lab on a Chip 8 (2008) 1185-1190.

On-chip electric field driven electrochemical detection using a poly(dimethylsiloxane) microchannel with gold microband electrodes, by O. Ordeig, N. Godino, F.J. Del Campo, F.J. Muñoz, F. Nikolajeff, L. Nyholm, Anal. Chem. 80 (2008) 3622-3632.

◆ Nanotube and nanowire devices

The highlights of the research results on carbon nanotubes, graphene, and Si nanowire based devices are summarized at the following publications in high-impact journals:

Subnanometer motion of cargoes driven by thermal gradients along carbon nanotubes, by A. Barreiro, R. Rurali, E. Hernandez, J. Moser, T. Pichler, L. Forró, A. Bachtold, Science 320 (2008) 775-778.

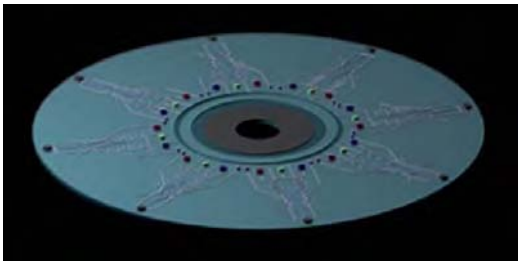
Hydrogenase-Coated Carbon Nano-tubes for Efficient H_2 Oxidation, by A. Alonso, O. Rüdiger, A. Maroto-Valiente, M. Velez, I. Rodríguez-Ramos, F.J. Muñoz, V.M. Fernández, A.L. De Lacey, Nano Lett. 7 (2007) 1603-1608.

Detecting Individual Electrons Using a Carbon Nanotube Field-Effect Transistor, by A. Grüneis, M.J. Esplandiu, D. García-Sanchez, A. Bachtold, Nano Lett. 7 (2007) 3766 -3769.

Mechanical detection of carbon nanotube resonator vibrations, by D. García-Sanchez, A. San Paulo, M.J. Esplandiu, F. Pérez-Murano, L. Forró, A. Aguasca, A. Bachtold, Phys. Rev. Lett. 99 (2007) 085501.

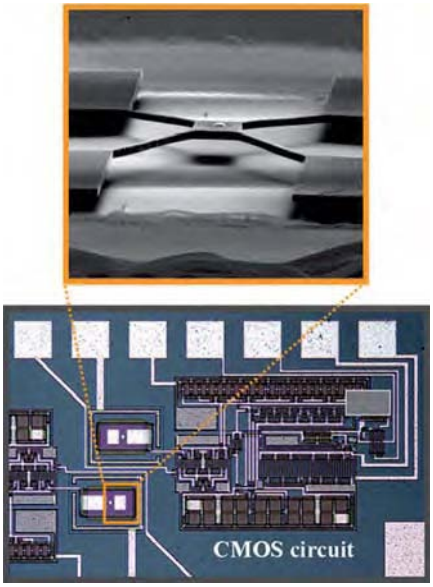
Imaging mechanical vibrations in suspended graphene sheets, by D. García-Sanchez, A.M. van der Zande, A. San Paulo, B. Lassagne, P.L. McEuen, A. Bachtold, Nano Lett. 8 (2008) 1399-1403.

Suspended Mechanical Structures Based on Elastic Silicon Nanowire Arrays, by A. San Paulo, N. Arellano, J.A. Plaza, R. He, C. Carraro, R. Maboudian, R.T. Howe, J. Bokor, P. Yang, Nano Lett. 7 (2007) 1100-1004.



ERC Grant

ENIAC projects



CMOS/NEMS integration

Nanofabrication

A new "gas-transfer" lithography technique has been developed for the direct patterning of substrates at the micrometer and nanometer scale. It is described in:

Silane nanopatterns via gas-phase soft lithography, by R. de la Rica, A. Baldi, E. Mendoza, A. San Paulo, A. Llobera, C. Fernández-Sánchez, Small 4 (2008) 1076-1079.

Prof. Francesc Pérez-Murano has coordinated the "Novopoly" (Novel polymer materials for MEMS and NEMS) STREP project of the 6th Framework Programme of the European Union. (FP6-NMP-013619; 2005-2008).

CMOS / NEMS integration

Following a sustained activity of developing CMOS compatible nanofabrication methods, IMB has developed sensors based on the monolithic integration of nanomechanical resonators in CMOS circuits. These sensors have outstanding performance in mass sensitivity and spatial resolution, which allows addressing applications such as the determination of the evaporation rate of sessile droplets at ambient pressure.

Outcomes of this activity include two cover pages on referred journals (see the publications section).

ERC Grant

A Starting Grant of the European Research Council was awarded to Dr. Andreu Llobera, postdoctoral researcher at IMB-CNM at the first call (2007). Project "Hip-Lab: High-throughput integrated photonic lab-on-a-DVD platforms" (ERC-2007-StG-209243-2).

New ENIAC projects

IMB-CNM participates in three projects approved in the first call (2008) of the European ENIAC Joint Undertaking on nanoelectronics.

Two of the projects are related with power devices technology for rational use of energy: E3CAR - Nanoelectronics for an Energy Efficient Electrical Car, and SmartPM - Smart Power Management in Home and Health.

The third project is on advanced double patterning lithography for the 22 nm technology node: LENS - Lithography Enhancement towards Nano Scale.

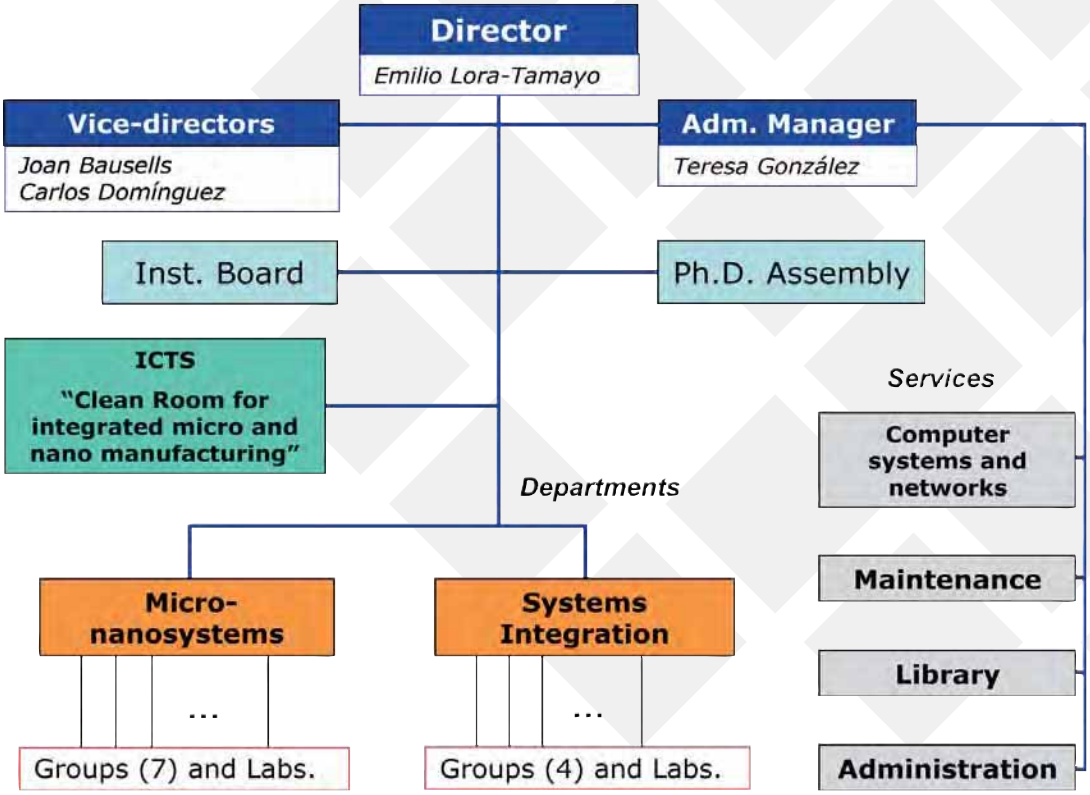
EXPLORA projects

Two IMB-CNM research groups have received funding from the Spanish EXPLORA-INGENIO 2010 program, for the exploration of radically new scientific ideas: *High-sensitivity electrical readout of proteomic microarrays* and *NANOTERM: Feasibility study for thermoelectrical microgenerators based on silicon nanowires.*

IMB structure

The Institute has two Departments, which gather the resources and activities related to scientific research: Micro-nanosystems and Systems Integration. Each Department is organised in various research groups. The micro and nanofabrication clean room is considered at the Department level but with a different nature, which goes beyond being a laboratory supporting the work done by the Departments. It is considered by CSIC as an Horizontal Unit. There is a dynamic internal organization within the Departments, assembling human resources according to the requirements of the research projects. The research lines touch horizontally this more or less vertical structure, gathering different skills and competences around specific scientific and technologic objectives.

IMB structure



Research groups

Micro-Nanosystems Department

Manuel Lozano

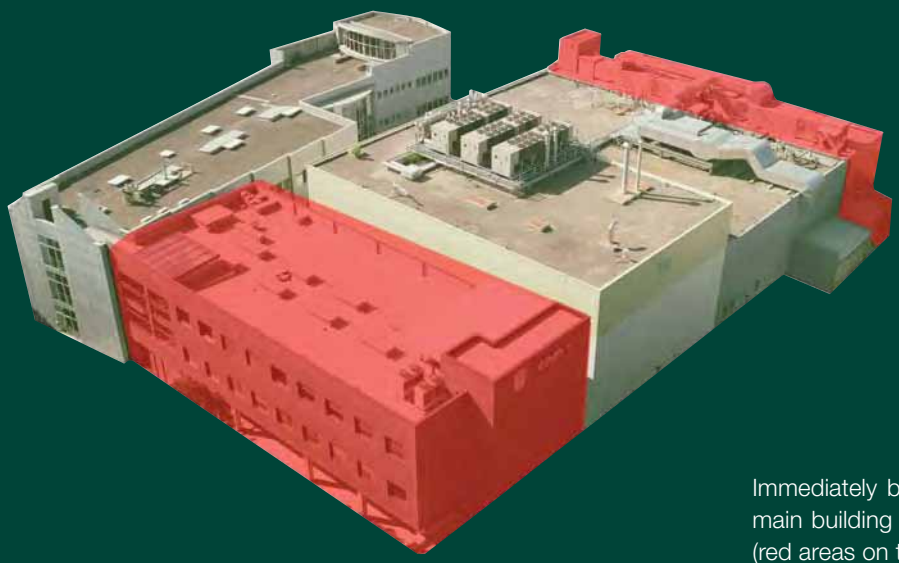
- **Bio MEMS**
  F. Xavier Muñoz
- **Electrochemical transducers**
  Cecília Jiménez
- **Gas sensors and fuel cells**
  Carles Cané
- **Micro-nano tools**
  Jaume Esteve
- **Nanofabrication and functional properties of nanostructures**
  Francesc Pérez
- **Radiation detectors**
  Manuel Lozano
- **Silicon photonics**
  Carlos Domínguez

Systems Integration Department

Philippe Godignon

- **Biomedical applications**
  Rosa Villa
- **Integrated circuits and systems**
  Lluís Terés
- **Integration of power devices and systems**
  José Millán
- **Reverse engineering in microelectronic devices**
  Salvador Hidalgo

Facilities



Immediately before the reporting period, both the main building and the clean room were expanded (red areas on the photograph).

The IMB offices and laboratories building added an additional “wing” which resulted in an increase from 5000 m^2 to 6500 m^2. The clean room building increased its surface from 1000 m^2 to 1500 m^2, which has allowed the integration in a single clean room of the micro and nanofabrication equipment.

Construction works for the IMB new offices and laboratories building (2005-2006).

Construction works for the clean room extension (2005-2007).

The IMB-CNM large scale facility (ICTS - Singular Scientific and Technological Facility)[1] includes a clean room for integrated micro and nanofabrication, a test and characterization service and a packaging service.

The clean room integrates microelectronic fabrication processes, microsystem technologies and nano fabrication equipment, such as electron beam lithography, nanoimprint lithography and focused ion beam.

A complete CMOS integrated circuit fabrication line is available. In addition, microsystems-dedicated equipment allows working with metals, etching solutions, etc. that could contaminate CMOS-dedicated machines. This duplication of many of the clean room processes has been allowed by the recent extension of the clean room. The whole set of processes runs on 100 mm diameter silicon wafers, and there is a partial capability for 150 mm diameter wafers.

Two access modalities are available for users: command of specific processes which are performed by the clean room personnel, and qualified self-service, which is only available for a limited (but growing) number of equipment.

An external access programme (GICSERV) is available from 2006, with funding from the Spanish Ministry of Science and Innovation, which allows external users to access the ICTS services for free, for projects of limited complexity. Up to 105 projects have been funded in this way up to the end of the reporting period, from Spain and some other European countries.

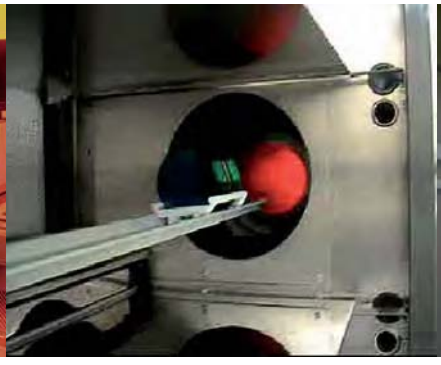
(1) ICTS is an official label given by the Spanish Ministry of Research and Innovation to up to (currently) 24 Spanish Large Scale Facilities.

Electron beam lithography system.

Medium current ion implanter with special implant chamber and ion species.

Service bay with vacuum pumps and other auxiliary equipment.

Mask aligners for microsystems ("non-CMOS") photolithography.



Oxidation/diffusion furnace

Rapid Manufacturing with an EOS Formiga P100 laser sintering system.

Research activities

Integrated circuits and systems

The research is devoted to analog, digital & RF CMOS design and test of integrated circuits and systems to improve and exploit the nano/micro-technologies for advanced applications, such as:

· Visible, infrared and X-ray analog & digital imagers.
· Integrated sensor & actuator N/MEMS interfaces.
· Multi-technological modeling & simulation.
· Low-power RF circuits for wireless sensors.
· Remote-powered and body-implantable systems.
· SoC & System electronics based on flexible platforms.

Micro-nano-bio systems

Design and development of novel micro and nanosensors and complex and compact miniaturized systems for biological and biomedical applications. The various steps of device design, characterization, encapsulation and packaging, as well as customized electronic instrumentation are approached from the initial conception to the final biodevice in order to generate knowledge, micro-nano devices and complete systems with high added value.

Activities include the development of new technologies and tools for the detection, identification, quantification, and monitoring of molecules, cells and tissues of clinical and biomedical relevance. Research focuses in:

· Micro-Nano systems for diagnosis.
· On-chip environmental health monitoring.
· Nano-Bio-Electronic Interfaces.
· NanoBioFuel cells.
· Nanobioelectrochemistry.

Micro-nanotechnologies

The general objective is the advanced research and development on new processes, devices and sensors for Integrated Circuits, MEMS, NEMS and Smart Systems, mainly using silicon based micro nano technologies. More specifically, the work includes research at different levels of integration such as design, simulation, fabrication, characterization and optimization tasks for:

- Processes and micro-nanoelectronic technologies and their integration (More Moore approach).
- Nano-systems, sensors, NMEMS (More than Moore approach).
- Application-oriented smart systems and subsystems for fields such as medical, environment, food, energy, telecom, particle physics, space, etc.

Specific topics addressed are: high-k dielectrics, reliability of devices and technologies, CMOS-MEMS, SOI-MEMS and 3-D heterogeneous integration, micro-nanotools, MOMS/NOMS, thermally isolated micro-nano-structures, radiation sensors, radiation hardness characterization, power MEMS (nano-thermoelectrics, scavenging and microfuel cells).

Nanofabrication and nanostructures

Investigation, study and exploitation of new and exceptional electromechanical properties that arise in solid state artificial structures by the fact that their significant dimensions are in the nanometer scale. These nanostructures are obtained by using 'so called' nanotechnological methods, so that research on advanced nanofabrication methods is an essential part of the activities. Also, development of specialized electromechanical characterization methods is of great interest. The aim is to investigate on novel properties and methods with a potential to demonstrate novel functionalities and ultra-high performance of electromechanical devices and systems. The main activities are:

- Advanced nanofabrication methods.
- Novel nanometrology tools and methods.
- Singular functional properties of nanostructures.
- Ultimate performance limits of nanodevices.

Power devices and systems

The activities include research on innovative and breakthrough technologies of power devices and systems for efficiency improvements and energy consumption reduction, with special emphasis on automotive, transport, aerospace, renewable energy and energy distribution applications. Specifically:

1. Silicon based power devices and integrated circuits: Modelling, design and processing of MOS controlled devices (DMOS, IGBT), LDMOS for high frequency, superjunction devices, SOI based power switches, smart power and protection devices.

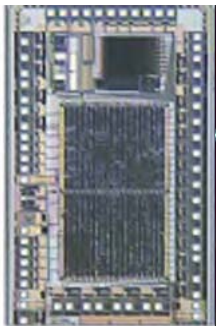
2. Wide Band Gap Semiconductors: Modelling and set up of optimized technologies for Wide Band Gap semiconductor (SiC, GaN, Diamond, Graphene on SiC) processing, design and implementation of novel power devices.

3. Power systems and heterogeneous integration: New methods for the design, modelling, simulation, development and characterization (thermal and electrical) of power integrated systems. New interconnection and packaging techniques. Reliability analysis.

Transducers for chemical and bio-chemical sensing

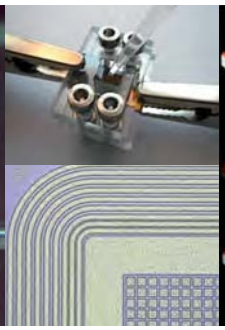
This activity is devoted to R&D of new chemical and biochemical transducers. Different transduction principles and/or signal propagation media are investigated, making use of new technologies combined with microelectronic technology, new device structures, processes and materials. This work is aimed at improving transducers performance and developing new concepts of sensors, autonomous systems, and platforms for lab-on-a-chip analytical systems.

Electrochemical devices: Barrier IDEAs, polySi impedimetric transducers, CNT sensors, voltammetric microelectrodes and UMEAs, ISFET sensors.
Photonic/Optical Devices.
Silicon based devices: Micro-optical components, optochemical sensors, interferometric devices, optomechanical components, Si nanocrystal light emitters.
Hybrid Si/polymer integration: Sol-gel based sensors, polymeric optical elements, free space components (hollow/MIR).
Advanced materials and processes: Functional organo-inorganic polymeric materials, gas phase soft-lithography, nanostructured materials for sensors.
Chemical sensor systems and arrays: Electrical protein microarray readers, multisensor systems, wireless RFID-like sensors.

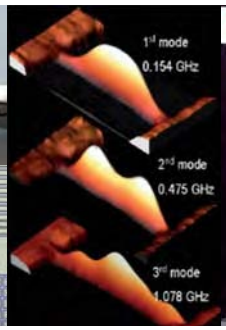


Integrated circuits and systems

Micro-nano-bio systems



Micro-nanotechnologies



Nanofabrication and nanostructures

Power devices and systems

Transducers for chemical and biochemical sensing

Publications

2007

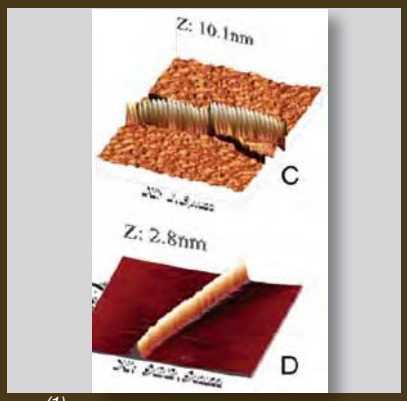
Abdesselam, A.; ... [et al.]; Campabadal, F.; Fleta, C.; Lozano, M.; Pellegrini, G.; Rafí, J.M.;Ullán, M., "The ATLAS semiconductor tracker end-cap module", NUCL. INSTR. METH. PHYS. RES. A ACCEL. SPECTROM. DETECTORS ASSOC. EQUIP., vol. 575, no. 3, 2007, p. 353-389.

Abella, M., Campoy, S., Erill, I., Rojo, F., Barbé, J., "Cohabitation of two different lexA regulons in Pseudomonas putida", J. BACTERIOLOGY, 2007, 189 (24), p. 8855-8862.

Aboy, M., Pelaz, L., Montserrat, J., Bermudez, F.J., Hamilton, J.J., "Boron diffusion and activation in SOI andw bulk Si: The role of the buried interface", NUCL. INSTR. METH. PHYS. RES. B, BEAM INTERACTIONS WITH MATERIALS AND ATOMS, 2007, 257 (1-2), p. 152-156.

Ahmad, A.; ... [et al.]; Lozano, M.; Ullán, M., "The silicon microstrip sensors of the ATLAS semiconductor tracker", NUCL. INSTR. METH. PHYS. RES. A ACCEL. SPECTROM. DETECTORS ASSOC. EQUIP., vol. 578, no. 1, 2007, p. 98-118.

Alonso, A.; Rüdiger, O.; Maroto-Valiente, A.; Velez, M.; Rodríguez-Ramos, I.; Muñoz, F.J.; Fernández, V.M.; De Lacey, A.L., "Hydrogenase-Coated Carbon Nanotubes for Efficient H2 Oxidation", NANO LETTERS, vol. 7, no. 6, 2007, p. 1603-1608. ***(FIGURE 1)***



(1)

Arcamone, J.; Sanchez-Amores, A.; Montserrat, J.; van den Boogaart, M.A.F; Brugger, J.; Pérez-Murano, F., "Dry etching for the correction of gap-induced blurring and improved pattern resolution in nanostencil lithography", J. MICRO/NANOLITHOGRAPHY, MEMS, AND MOEMS, vol. 6, no. 1, 2007, 013005. ***(COVER 2)***

(2)

Arcamone, J.; Misischi, B.; Serra-Graells, F.; Brugger, J.; Torres, F.; Abadal, G.; Barniol, N.; Pérez-Murano, F., "A compact and low-power CMOS circuit for fully integrated NEMS resonators", IEEE TRANS. ON CIRCUITS AND SYSTEMS II, vol. 54, no. 5, 2007, p. 377-381.

Arcamone, J.; Dujardin, E.; Rius, G.; Pérez-Murano, F.; Ondarçuhu, T., "Evaporation of femtoliter sessile droplets monitored with nanomechanical mass sensors", J. PHYSICAL CHEMISTRY B, vol. 111, no. 45, 2007, p. 13020 -13027.

Baglio, S.; Pérez-Rodríguez, A.; Martínez, S.; Serre, C.; Morante, J.R.; Esteve, J.; Montserrat, J., "Microinductive Signal Conditioning With Resonant Differential Filters: High-Sensitivity Biodetection Applications", IEEE TRANS. ON INSTRUMENTATION AND MEASUREMENT, vol. 56, no. 5, 2007, p. 1590-1595.

Barnes, A.S.; Fietkau, N.; Chevallier, F.G.; Del Campo, F.J.; Mas, R.; Muñoz, F.J.; Jones, T.G.J.; Compton, R.G., "Electrochemical sizing of hemispherical microdroplets immobilized as regular arrays on partially blocked electrodes", J. ELECTROANALYTICAL CHEMISTRY, vol. 602, no. 1, 2007, p. 1-7.

Barreiro, A.; Kramberger, C.; Rümmeli, M.H.; Grüneis, A.; Grimm, D.; Hampel, S.; Gemming, T.; Büchner, B.; Bachtold, A.; Pichler, T., "Control of the single-wall carbon nanotube mean diameter in sulphur promoted aerosolassisted chemical vapour deposition", CARBON, vol. 45, no. 1, 2007, p. 55-61.

Barreto, J.; Perálvarez, M.; Rodríguez, J.A.; Morales, A.; Riera, M.; López, M.; Garrido, B.; Domínguez, C., "Pulsed electroluminescence in silicon nanocrystals-based devices fabricated by PECVD", PHYSICA E LOW DIMENSIONAL SYSTEMS NANOSTRUCTURES, vol. 38, no. 1-2, 2007, p. 193-196.

Bigas, M.; Cabruja, E.; Lozano, M., "Bonding techniques for hybrid active pixel sensors (HAPS)", NUCL. INSTR. METH. PHYS. RES. A ACCEL. SPECTROMETERS DETECTORS ASSOC. EQUIP., vol. 574, no. 2, 2007, p. 392-400.

Buzzo, M.; Ciappa, M.; Millán, J.; Godignon, P.; Fichtner, M., "Two-dimensional dopant imaging of silicon carbide devices by secondary electron potential contrast", MICROELECTRONIC ENGINEERING, vol. 84, no. 3, 2007, p. 413-418.

Cabruja, E.; Bigas, M.; Pellegrini, G.; Lozano, M., "Special bump bonding technique for silicon pixel detectors", NUCL. INSTR. METH. PHYS. RES. A ACCEL. SPECTROM. DETECTORS ASSOC. EQUIP., vol. 576, no. 1, 2007, p. 150-153.

Campanella, H.; Hernández-Ramírez, F.; Romano-Rodríguez, A.; Montserrat, J.; Uranga, A.; Barniol, N.; Esteve, J., "Focused-ion-beam-assisted tuning of thin-film bulk acoustic wave resonators", J. MICROMECHANICS AND MICROENGINEERING, vol. 17, no. 11, 2007, p.2380-2389.

Castellarnau, M., Zine, N., Bausells, J., Madrid, C., Juarez, A., Samitier, J., Errachid, A., "Integrated cell positioning and cell-based ISFET biosensors", SENSORS AND ACTUATORS B CHEMICAL, 2007, 120 (2), p. 615-620.

Cortés, I.; Roig, J.; Flores, D.; Hidalgo, S.; Rebollo, J., "On the feasibility of superjunction thick-SOI power LDMOS transistors for RF base station applications", SEMICONDUCTOR SCIENCE AND TECHNOLOGY, vol. 22, no. 2, 2007, p. 1-9.

Cortés, I.; Fernández-Martínez, P.; Flores, D.; Hidalgo, S.; Rebollo, J., "The thin SOI TGLDMOS transistor: A suitable power structure for low voltage applications", SEMICONDUCTOR SCIENCE AND TECHNOLOGY, vol. 22, no. 10, 2007, p. 1183-1188.

Cortina-Puig, M.; Muñoz-Berbel, X.; Alonso, A.; Muñoz, F.J.; Del Valle, M., "EIS multianalyte sensing with an automated SIA system—An electronic tongue employing the impedimetric signal", TALANTA, vol. 72, no. 2, 2007, p. 774-779.

Cortina-Puig, M.; Muñoz-Berbel, X.; Del Valle, M.; Muñoz, F.J.; Alonso, A., "Characterization of an ion-selective polypyrrole coating and application to the joint determination of potassium, sodium and ammonium by electrochemical impedance spectroscopy and partial least squares method", ANALYTICA CHIMICA ACTA, vol. 597, no. 2, 2007, p. 231-237.

Darwish, N.; Dieguez, L.; Moreno, M.; Muñoz, F.J.; Mas, R.; Mas, J.; Samitier, J.; Nilsson, B.; Petersson, G., "Second order effects of aspect ratio variations in high sensitivity grating couplers", MICROELECTRONIC ENGINEERING, vol. 84, no. 5-8, 2007, p. 1775-1778.

Del Campo, F.J.; Ordeig, O.; Vigues, N.; Godino, N.; Mas, J.; Muñoz, F.J., "Continuous Measurement of Acute Toxicity in Water using a Solid State Microrespirometer", SENSORS AND ACTUATORS B CHEMICAL, vol. 126, no. 2, 2007, 515-521.

Dominguez, M., Pons, J., Ricart, J., Figueras, E. "The MEMS Pulsed Digital Oscillator (PDO) below the Nyquist limit", SENSORS AND ACTUATORS A PHYSICAL, 2007, 136 (2), p. 690-696.

Fernandez-Cuesta, I; Bundgaard Nielsen, R.; Boltasseva, A.; Borrisé, X.; Pérez-Murano, F.; Kristensen, A., "V-groove plasmonic waveguides fabricated by nanoimprint lithography", J. VACUUM SCIENCE AND TECHNOLOGY B MICROELECTRONICS PROCESSING AND PHENOMENA, vol. 25, no. 6, 2007, p. 2649-2653.

Fernández, M.J.; Fontecha, J.L.; Sayago, I.; Aleixandre, M.; Lozano, J.; Gutiérrez, J.; Gràcia, I.; Cané, C.; Horrillo, M.C., "Discrimination of volatile compounds through an electronic nose based on ZnO SAW sensors", SENSORS AND ACTUATORS B CHEMICAL, vol. 127, no. 1, 2007, p. 277-283.

Fietkau, N.; Streeter, I.; Del Campo, F.J.; Llobera, A.; Mas, R.; Muñoz, F.J.; Compton, R.G., "Voltammetric sizing and shaping of a cylinder", J. ELECTROANALYTICAL CHEMISTRY, vol. 611, no. 1-2, 2007, p. 201-207.

Fietkau, N.; Del Campo, F.J.; Mas, R.; Muñoz, F.J.; Compton, R.G., "Photoelectrochemical ruler: measurement at the micron scale", ANALYST, vol. 132, no. 10, 2007, p. 983-985.

Fleta, C.; Lozano, M.; Pellegrini, G.; Campabadal, F.; Rafí, J.M.; Ullán, M., "P-spray implant optimization for the fabrication of n-in-p microstrip detectors", NUCL. INSTR. METH. PHYS. RES. A ACCEL. SPECTROM. DETECTORS AND ASSOC. EQUIP., vol. 573, no. 1-2, 2007, p. 8-11.

Fleta, C.; Pennicard, D.; Bates, R.; Parkes, C.; Pellegrini, G.; Lozano, M.; Wright, V.; Boscardin, M.; Dalla Betta, G:F.; Piemonte, C.; Pozza, A.; Ronchin, S.; Zorzi, N., "Simulation and test of 3D silicon radiation detectors", NUCL. INSTR. METH. PHYS. RES. A ACCEL. SPECTROM. DETECTORS ASSOC. EQUIP., vol. 579, no. 2, 2007, p. 642-647.

Fraxedas, J.; Rius, G.; Pérez-Murano, F.; Verdaguer, A., "Determining radial breathing mode frequencies of single-walled carbon nanotubes with an atomic force microscope", EUROPHYSICS LETTERS, vol. 78, no. 1, 2007, 16001.

Gabriel, G.; Erill, I.; Caro, J.; Gómez, R.; Riera, D.; Villa, R.; Godignon, P.,"Manufacturing and full characterization of silicon carbide-based multi-sensor microprobes for biomedical applications", MICROELECTRONICS JOURNAL, vol.38,no.3, 2007, p. 406-415.

García-Cantón, J.; Merlos, A.; Baldi, A., "High quality factor electrolyte-insulator-silicon capacitor for wireless chemical sensing", IEEE ELECTRON DEVICE LETTERS, vol. 28, no. 1, 2007, 27-29.

García-Cantón, J., Merlos, A., Baldi, A., "A wireless LC chemical sensor based on a high quality factor EIS capacitor", SENSORS AND ACTUATORS B CHEMICAL, 2007, 126 (2), p. 648-654.

García-Sanchez, D.; San Paulo, A.; Esplandiu, M.J.; Pérez-Murano, F.; Forró, L.; Aguasca, A.; Bachtold, A., "Mechanical detection of carbon nanotube resonator vibrations", PHYSICAL REVIEW LETTERS, vol. 99, no. 8, 2007, 085501. *(FIGURE 3)*

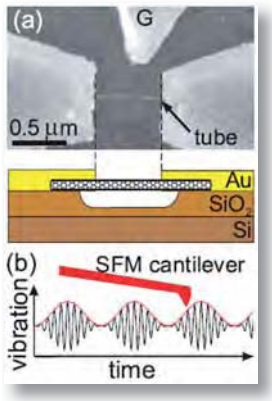
Proceedings of MNE 2006, Microelec. Eng. vol. 84, issues 5-8 (2007). Eds. J. Bausells, G. Abadal, F. Pérez-Murano.

Gonzalo, J.; Alonso, A.; Muñoz, F.J., "Screen-printed biosensors for glucose determination in grape juice", BIOSENSORS BIOELECTRONICS, vol. 22, no. 7, 2007, p. 1517-1521.

Gourgon, C.; Chaix , C.; Schift , H.; Tormen, M.; Landis , S.; Sotomayor Torres , C.M.; Kristensen, A.; Pedersen, R.H.; Christiansen , M.B.; Fernandez-Cuesta, I; Mendels , D.; Montelius , L.; Haatainen , T., "Benchmarking of 50 nm features in thermal nanoimprint", J. VACUUM SCIENCE AND TECHNOLOGY B MICROELECTRONICS PROCESSING AND PHENOMENA, vol. 25, no. 6, 2007, p. 2373-2378.

Grüneis, A.; Esplandiu, M.J.; García-Sanchez, D.; Bachtold, A., "Detecting Individual Electrons Using a Carbon Nanotube Field-Effect Transistor", NANO LETTERS, vol. 7, no. 12, 2007, p. 3766 -3769.

Hayama, K.; Takakura, K.; Yoneoka, M.; Ohyama, H.; Rafí, J.M.; Mercha, A.; Simoen, E.; Claeys, C., "Dose rate dependence of the back gate degradation in thin gate oxide PD-SOI MOSFETs by 2-MeV electron irradiation", MICROELECTRONIC ENGINEERING, vol. 84, no. 9-10, 2007, p. 2125-2128.



(3)

Publications

Huang, Y.L.; Simoen, E.; Claeys, C.; Rafí, J.M.; Clauws, P.; Finger, F., "A DLTS study on plasma-hydrogenated n-type high-resistivity magnetic Cz silicon", J. MATERIALS SCIENCE MATERIALS IN ELECTRONICS, vol. 18, no. 7, 2007, p. 705-710.

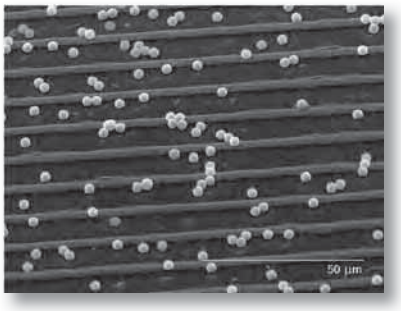
Ivanov, P.; Blanco, F.; Gràcia, I.; Sabaté, N.; Ruíz, A.; Vilanova, X.; Correig, X.; Fonseca, L.; Figueras, E.; Santander, J.; Cané, C., "Improvement of the gas sensor response via silicon -preconcentrator", SENSORS AND ACTUATORS B CHEMICAL, vol. 127, no. 1, 2007, p. 288-294.

Izquierdo, D.; Puyol, M.; Salinas, I.; Alonso, R.; Alonso, J.; Domínguez, C.; Garcés, I., "Dual-wavelength measurement system for absorbance chemical sensing", MEASUREMENT SCIENCE AND TECHNOLOGY, vol. 18, no. 11, 2007, p. 3443- 3450.

de la Rica, R.; Baldi, A.; Fernández-Sánchez, C., "Local detection of enzymatic ion generation with polycrystalline silicon interdigitated electrodes and its application to biosensing", APPLIED PHYSICS LETTERS, vol. 90, no. 7, 2007, 074102.

de la Rica, R.; Fernández-Sánchez, C.; Baldi, A., "Electric pre-concentration and detection of latex beads with interdigitated electrodes", APPLIED PHYSICS LETTERS, vol. 90, no. 17, 2007, 174104. ***(FIGURE 4)***

(4)



Lacasta, C.; Campabadal, F.; Fleta, C.; Garcia, C.; Lozano, M.; Martí, S.; Miñano, M.; Pellegrini, G.; Rafí, J.M.; Ullán, M., "Characterisation of p-type detectors for the future Super-LHC", NUCL. INSTR. METH. PHYS. RES. A ACCEL. SPECTROM. DETECTORS ASSOC. EQUIP., vol. 579, no. 2, 2007, p. 604-607.

Laczka, O.; Del Campo, F.J.; Muñoz, F.J., "Pathogen detection: A perspective of traditional methods and biosensors", BIOSENSORS BIOELECTRONICS, vol. 22, no. 7, 2007, p. 1205-1207.

Li, Z.; Chen, W.; Guo, Y.H.; Lissauer, D.; Lynn, D.; Radeka, V.; Pellegrini, G., "Development, Simulation and Processing of New 3d Si Detectors", NUCL. INSTR. METH. PHYS. RES. A ACCEL. SPECTROM. DETECTORS ASSOC. EQUIP., vol. 583, no. 1, 2007, p. 139-148.

Llobera, A.; Seidemann, V.; Plaza, J.A.; Cadarso, V.J.; Buttgenbach, S., "SU-8 optical accelerometers", J. MICROELECTROMECHANICAL SYSTEMS, vol. 16, no. 1, 2007, p. 111-121.

Llobera, A.; Demming, S.; Wilke, R.; Buttgenbach, S., "Multiple internal reflection poly(dimethylsiloxane) systems for optical sensing", LAB ON A CHIP, vol. 7, no. 11, 2007, p. 1560-1566. ***(FIGURE 5)***

(5)

Lopeandia, A.F.; León-Gutierrez, E.; Rodríguez-Viejo, J.; Muñoz, F.J., "Design issues involved in the development of a membrane-based high-temperature nanocalorimeter", MICROELECTRONIC ENGINEERING, vol. 84, no. 5-8, 2007, p. 1288-1291.

Lozano, M.; Pellegrini, G.; Martí, S.; Miñano, M.; Campabadal, F.; Ullán, M.; Rafí, J.M.; Garcia, C.; Lacasta, C., "Ultimate limits for the radiation hardness of silicon strip detectors for sLHC", NUCL. INSTR. METH. PHYS. RES. A ACCEL. SPECTROM. DETECTORS ASSOC. EQUIP., vol. 581, no. 1-2, 2007, p 365-367.

Lozano, M.; ... [et al.], "SiLC R&D: Design, present status and perspectives", NUCL. INSTR. METH. PHYS. RES. A ACCEL. SPECTROM. DETECTORS ASSOC. EQUIP., vol. 579, no. 2, 2007, p. 750-753.

Luna-López, J.A.; Aceves-Mijares, M.; Malik, A.; Yu, Z.; Morales, A.; Domínguez, C.; Rickards, J., "Compositional and structural characterization of silicon nanoparticles embedded in silicon rich oxide", REVISTA MEXICANA DE FÍSICA, vol. 53, no. 7, 2007, p. 293-298.

Luque, A., Perdigones, F.A., Esteve, J., Montserrat, J., Gañán-Calvo, A., Quero, J., "Silicon Microdevice for Emulsion Production Using Three-Dimensional Flow Focusing", J. MICROELECTROMECHANICAL SYSTEMS, 2007, 16 (5), p. 1201-1208.

Martin, C.; Rius, G.; Llobera, A.; Voigt, A.; Gruetzner, G.; Pérez-Murano, F., "Electron beam lithography at 10 keV using an epoxy based high resolution negative resist", MICROELECTRONIC ENGINEERING, vol. 84, no. 5-8, 2007, p.1096-1099.

Millán, J., "Wide band-gap Power Semiconductor Devices", IEE PROCEEDINGS CIRCUITS DEVICES AND SYSTEMS, vol. 1, no. 5, 2007, p. 372-379.

Miñano, M.; Campabadal, F.; Escobar, C.; Garcia, C.; González, S.; Lacasta, C.; Lozano, M.; Martí, S.; García, S.; González, C.M.; Lacasta, C.; Lozano, M.; Martí, S.; Pellegrini, G.; Rafí, J.M.; Ullán, M., "Characterization of irradiated detectors fabricated on p-type silicon substrates for super-LHC", NUCL. INSTR. METH. PHYS. RES. A ACCEL. SPECTROM. DETECTORS ASSOC. EQUIP., vol. 583, no. 1, 2007, p. 33-36.

Morales, A.; Barreto, J.; Domínguez, C.; Riera, M.; Aceves, M.; Carrillo, J., "Comparative study between Silicon Rich Oxide films obtained by LPCVD and PECVD", PHYSICA E LOW DIMENSIONAL SYSTEMS NANOSTRUCTURES, vol. 38, no. 1-2, 2007, p. 54-58.

Morales, A.; Domínguez, C.; Barreto, J.; Riera, M.; Aceves, M.; Luna-López, J.A.; Yu, Z.; Kiebach, R.,"Nanobiosensors based on optoelectronic and nanomechanical transducers for genomic and proteomic applications", REVISTA MEXICANA DE FÍSICA, vol. 53, no. 7, 2007, p. 279-282.

Moser, J.; Barreiro, A.; Bachtold, A., "Current-induced cleaning of graphene", APPLIED PHYSICS LETTERS, vol. 91, no. 16, 2007, 163513.

Muñoz-Berbel, X.; Vigues, N.; Mas, J.; Jenkins, A. Toby A.; Muñoz, F.J., "Impedimetric characterization of the changes produced in the electrode–solution interface by bacterial attachment", ELECTROCHEMISTRY COMMUNICATIONS, vol. 9, no. 11, 2007, p. 2654-2660.

Ordeig, O.; Del Campo, F.J.; Muñoz, F.J.; Banks, C.E.; Compton, R.G., "Electroanalysis Utilizing Amperometric Microdisk Electrode Arrays", ELECTROANALYSIS, vol. 19, no. 19-20, 2007, p. 1973-1986.

Orozco, J.; Baldi, A.; Baena, R.; Cadarso, A.; Bratov, A.; Jiménez, C., "Portable system based on microsensors for environmental monitoring applications", MEASUREMENT SCIENCE & TECHNOLOGY, vol. 18, no. 3, 2007, p. 935-940.

Orozco, J.; Suárez, G.; Fernández-Sánchez, C.; McNeil, C.J.; Jiménez, C., "Characterization of ultramicroelectrode arrays combining electrochemical techniques and optical microscopy imaging", ELECTROCHIMICA ACTA, vol. 53, no. 2, 2007, p. 729-736.

Pan, T.; Baldi, A.; Ziaie, B., "Remotely adjustable check-valves with an electrochemical release mechanism for implantable biomedical microsystems", BIOMEDICAL MICRODEVICES, vol. 9, no. 3, 2007, 385-394.

Parramón, D.; Erill, I.; Guimerà, A.; Ivorra, A.; Muñoz, A.; Sola, A.; Fondevila, C.; Garcia- Valdecasas, J.C.; Villa, R., "In vivo detection of liver steatosis in rats based on impedance spectroscopy", PHYSIOLOGICAL MEASUREMENT, vol. 28, no. 8, 2007, p. 813-828.

Pellegrini, G.; Campabadal, F.; Lozano, M.; Martí, S.; Miñano, M.; Rafí, J.M.; Ullán, M., "Characterization of edgeless detectors fabricated by dry etching process", NUCL. INSTR. METH. PHYS. RES. SECTION A ACCEL. SPECTROM. DETECTORS AND ASSOC. EQUIP., vol. 576, no. 1, 2007, p. 95-97.

Pellegrini, G.; Maiorino, M.; Blanchot, G.; Chmeissani, M.; Garcia, J.; Lozano, M.; Martínez, R.; Puigdengoles, C.; Ullán, M., "Direct charge sharing observation in single-photon-counting pixel detector", NUCL. INSTR. METH. PHYS. RES. A ACCEL. SPECTROM. DETECTORS ASSOC. EQUIP., vol. 573, no. 1-2, 2007, p. 137-140.

Pellegrini, G.; Fleta, C.; Campabadal, F.; Miñano, M.; Lozano, M.; Rafí, J.M.; Ullán, M., "Technology of p-type microstrip detectors with radiation hard p-spray, p-stop and moderated p-spray insulations", NUCL. INSTR. METH. PHYS. RES. A ACCEL. SPECTROM. DETECTORS ASSOC. EQUIP., vol. 579, no. 2, 2007, p. 599-603.

Pennicard, D.; Pellegrini, G.; Lozano, M.; Bates, R.; Parkes, C.; Wright, V., "Simulation Results From Double-Sided 3-D Detectors", IEEE TRANS. ON NUCLEAR SCIENCE, vol. 54, no. 4, part.2, 2007, p. 1435-1443.

Perpiñá, X.; Castellazzi, A.; Piton, M.; Mermet-Guyennet, M.; Millán, J., "Failure-relevant Abnormal Events in Power Inverters Considering Measured IGBT Module Temperature Inhomogeneities", MICROELECTRONICS RELIABILITY, vol. 47, no. 9-11, 2007, p. 1784-1789.

Perpiñá, X.; Piton, M.; Mermet-Guyennet, M.; Jordà, X.; Millán, J., "Local thermal cycles determination in thermosyphon-cooled traction IGBT modules reproducing mission profiles", MICROELECTRONICS RELIABILITY, vol. 47, no. 9-11, 2007, p.1701-1706.

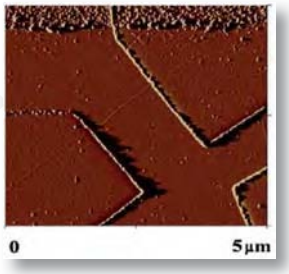
Plaza, J.A.; Zinoviev, K.; Villanueva, G.; Domínguez, C., "Novel cantilever design with high control of the mechanical performance", MICROELECTRONIC ENGINEERING, vol. 84, no. 5-8, 2007, p.1292-1295.

Rafí, J.M.; Simoen, E.; Mercha, A.; Hayama, K.; Campabadal, F.; Ohyama, H.; Claeys, C., "Electrical stress on irradiated thin gate oxide partially depleted SOI nMOSFETs", MICROELECTRONIC ENGINEERING, vol. 84, no. 9-10, 2007, p. 2081-2084.

Rafí, J.M.; Simoen, E.; Mercha, A.; Collaert, N.; Hayama, K.; Campabadal, F.; Claeys, C., "Gate induced floating body effects in TiN/SiON and TiN/HfO_2 gate stack triple gate SOI nFinFETs", SOLID STATE ELECTRONICS, vol. 51, no. 9, 2007, p. 1201-1210.

Riera, M.; Rodríguez, J.A.; Barreto, J.; Domínguez, C., "Modeling of non-stoichiometric silicon oxides obtained by plasma enhanced chemical vapour deposition process", THIN SOLID FILMS, vol. 515, no. 7-8, 2007, p. 3380-3386.

Rius, G.; Martín, I.; Godignon, P.; Bachtold, A.; Bausells, J.; Lora-Tamayo, E.; Pérez-Murano, F., "Response of carbon nanotube transistors to electron beam exposure", MICROELECTRONIC ENGINEERING, vol. 84, no. 5-8, 2007, p.1596-1600. ***(FIGURE 6)***

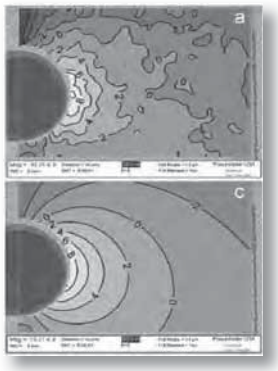


(6)

Ronchin, S.; Boscardin, M.; Piemonte, C.; Pozza, A.; Zorzi, N.; Dalla Betta, G:F.; Bosisio, L.; Pellegrini, G., "Fabrication of 3D detectors with columnar electrodes of the same doping type", NUCL. INSTR. METH. PHYS. RES. A ACCEL. SPECTROM. DETECTORS ASSOC. EQUIP., vol. 573, no. 1-2, 2007, p. 224-227.

Rubio, R.; Santander, J.; Fonseca, L.; Sabaté, N.; Gràcia, I.; Cané, C.; Udina, S.; Marco, S., "Non-selective NDIR array for gas detection", SENSORS AND ACTUATORS B CHEMICAL, vol. 127, no. 1, 2007, p. 69-73.

Sabaté, N.; Vogel, D.; Gollhardt, A.; Keller, J.; Cané, C.; Gràcia, I.; Morante, J.R.; Michel, B., "Residual stress measurement on a MEMS structure with high-spatial resolution", J. MICROELECTROMECHANICAL SYSTEMS, vol. 16, no. 2, 2007, p. 365-372. ***(FIGURE 7)***



(7)

Ruíz, A.; Gràcia, I.; Sabaté, N.; Ivanov, P.; Sanchez-Amores, A.; Duch, M.; Gerboles, M.; Moreno, A.; Cané, C., "Membrane-suspended microgrid as a gas preconcentrator for chromatographic applications", SENSORS AND ACTUATORS A PHYSICAL, vol. 135, no. 1, 2007, p. 192-196.

Sabaté, N.; Vogel, D.; Keller, J.; Gollhardt, A.; Marcos, J.; Gràcia, I.; Cané, C.; Michel, B., "FIB-based technique for stress characterization on thin films for reliability purposes", MICROELECTRONIC ENGINEERING, vol. 84, no. 5-8, 2007, p.1783-1787.

Sacristán, J.; Osés, T., "Implantable stimulator and recording device for artificial prosthesis control", MICROELECTRONICS JOURNAL, vol. 38, no. 12, 2007, p. 1135-1149.

Sánchez, S.; Pumera, M.; Cabruja, E.; Fàbregas, E., "Carbon nanotube/polysulfone composite screen-printed electrochemical enzyme biosensors", ANALYST, vol. 132, no. 2, 2007, p. 142-147.

San Paulo, A.; Arellano, N.; Plaza, J.A.; He, R.; Carraro, C.; Maboudian, R.; Howe, R.T.; Bokor, J.; Yang, P., "Suspended Mechanical Structures Based on Elastic Silicon Nanowire Arrays", NANO LETTERS, vol. 7, no. 4, 2007, p. 1100-1004.

San Paulo, A., Black, J., White, R., Bokor, J., "Detection of nanomechanical vibrations by dynamic force microscopy in higher cantilever eigenmodes", APPLIED PHYSICS LETTERS, 2007, 91 (5), Art. Nº 053116.

San Paulo, A.; Quevy, E.; Black, J.; Howe, R.T.; White, R.; Bokor, J., "Mode shape imaging of out-of-plane and in-plane vibrating RF micro-

Publications

mechanical resonators by atomic force microscopy", MICROELECTRONIC ENGINEERING, vol. 84, no. 5-8, 2007, p.1354-1357.

Serra-Graells, F.; Misischi, B.; Casanueva, E.; Méndez, C.; Terés, L., "Low-Power and Compact CMOS APS Circuits for Hybrid Cryogenic Infrared Fast Imaging", IEEE TRANS. ON CIRCUITS AND SYSTEMS II EXPRESS BRIEFS, vol. 54, no. 12, 2007, p. 1052-1056.

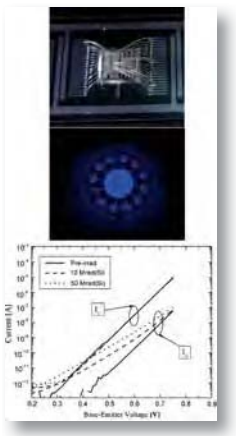
Serre, C.; Pérez-Rodríguez, A.; Fondevilla, N.; Morante, J.R.; Montserrat, J.; Esteve, J., "Vibrational energy scavenging with Si technology electromagnetic inertial microgenerators", MICROSYSTEM TECHNOLOGIES, vol. 13, no. 11-12, 2007, p. 1655-1661.

Soueidan, M.; Ferro, G.; Jacquier, C.; Godignon, P.; Pezoldt, J.; Lazar, M.; Nsouli, B.; Monteil, Y., "Improvement of 4H-SiC Selective Epitaxial Growth by VLS Mechanism Using Al and Ge Based Melts", DIAMOND AND RELATED MATERIALS, vol. 16, no. 1, 2007, p. 37-45.

Tanaka, K., Kihara, R., Sanchez-Amores, A., Montserrat, J., Esteve, J., "Parasitic effect on silicon MEMS resonator model parameters", MICROELECTRONIC ENGINEERING, 2007, 84 (5-8), p.1363-1368.

Torres, F.; Teva, J.; López, J.L.; Uranga, A.; Abadal, G.; Barniol, N.; Sanchez-Amores, A.; Montserrat, J.; Pérez-Murano, F.; Esteve, J., "Nanometer Scale Gaps for Capacitive Transduction Improvement on RF-MEMS Resonators", MICROELECTRONIC ENGINEERING, vol. 84, no. 5-8, 2007, p.1384-1387.

Ullán, M.; Díez, S.; Campabadal, F.; Lozano, M.; Pellegrini, G.; Knoll, D.; Heinemann, B., "Gamma Radiation Effects on Different Varieties of SiGe:C HBT Technologies", IEEE TRANS. ON NUCLEAR SCIENCE, vol. 54, no. 4, part.2, 2007, p. 989-993. ***(FIGURE 8)***



(8)

Ullán, M.; Díez, S.; Campabadal, F.; Lozano, M.; Pellegrini, G.; Knoll, D.; Heinemann, B., "Radiation hardness evaluation of SiGe HBT technologies for the Front-End electronics of the ATLAS Upgrade", NUCL. INSTR. METH. PHYS. RES. A ACCEL. SPECTROM. DETECTORS ASSOC. EQUIP., vol. 579, no. 2, 2007, p. 828-832.

Uranga, A.; Verd, J.; Torres, F.; Teva, J.; López, J.L.; Abadal, G.; Esteve, J.; Pérez-Murano, F., "Electrical detection of multiple resonant modes in a CMOS-MEMS cantilever", MICROELECTRONIC ENGINEERING, vol. 84, no. 5-8, 2007, p.1374-1378.

Uranga, A.; Verd, J.; López, J.L.; Teva, J.; Abadal, G.; Torres, F.; Esteve, J.; Pérez-Murano, F.; Barniol, N., "Fully integrated MIXLER based on VHF CMOS-MEMS clamped-clamped beam resonator", ELECTRONICS LETTERS, vol. 43, no. 8, 2007, p. 452-454.

Uranga, A.; Sacristán, J.; Osés, T.; Barniol, N., "Electrode–Tissue Impedance Measurement CMOS ASIC for Functional Electrical Stimulation Neuroprostheses", IEEE TRANS. ON INSTRUMENTATION AND MEASUREMENT, vol. 56, no. 5, 2007, p. 2043-2050.

Urresti, J.; Castellazzi, A.; Piton, M.; Rebollo, J.; Mermet-Guyennet, M.; Ciappa, M., "Robustness test and failure analysis of IGBT modules during turn-off", MICROELECTRONICS RELIABILITY, vol. 47, no. 9-11, 2007, p. 1725-1729.

Vallejos, S.; Khatko, V.; Aguir, K.; Ngo, K.; Calderer, J.; Gràcia, I.; Cané, C.; Llobet, E.; Correig, X., "Ozone monitoring by micro-machined sensors with WO_3 sensing films", SENSORS AND ACTUATORS B CHEMICAL, vol. 126, no. 2, 2007, p. 573-578.

Vellvehí, M.; Jordà, X.; Godignon, P.; Ferrer, C.; Millán, J., "Coupled Electro-thermal Simulation of a DC/DC Converter", MICROELECTRONICS RELIABILITY, vol. 47, no. 12, 2007, p. 2114-2121.

Verd, J.; Uranga, A.; Abadal, G.; Teva, J.; Torres, F.; Pérez-Murano, F.; Fraxedas, J.; Esteve, J.; Barniol, N., "Monolithic mass sensor fabricated using a conventional technology with attogram resolution in air conditions", APPLIED PHYSICS LETTERS, vol. 91, no. 1, 2007, 013501. ***(COVER 9)***

Verd, J., Uranga, A., Abadal, G., Teva, J., Pérez-Murano, F., Barniol, N., "High-sensitivity capacitive sensing interfacing circuit for monolithic CMOS M/NEMS resonators", ELECTRONICS LETTERS, 2007, 43 (23), p. 1274-1275.

Vergara, A., Llobet, E., Ramírez, J.L., Ivanov, P., Fonseca, L., Zampolli, S., Scorzoni, A., Becker, T., Marco, S., Wöllenstein, J., "An RFID reader with onboard sensing capability for monitoring fruit quality", SENSORS AND ACTUATORS B CHEMICAL, 2007, 127 (1), p. 143-149.

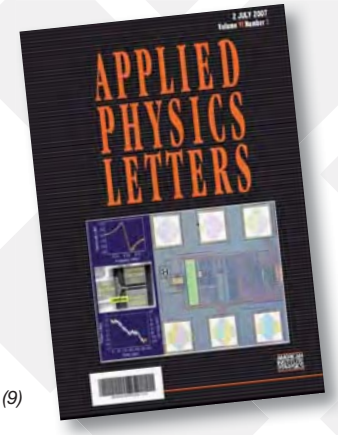
Vergara, A.; Llobet, E.; Brezmes, J.; Ivanov, P.; Cané, C.; Gràcia, I.; Vilanova, X.; Correig, X., "Quantitative gas mixture analysis using temperature-modulated micro-hotplate gas sensors: Selection and validation of the optimal modulating frequencies", SENSORS AND ACTUATORS B CHEMICAL, vol. 123, no. 2, 2007, p. 1002-1016.

Villanueva, G.; Plaza, J.A.; Sanchez-Amores, A.; Zinoviev, K.; Pérez-Murano, F.; Bausells, J., "DRIE based novel technique for AFM probes fabrication", MICROELECTRONIC ENGINEERING, vol. 84, no. 5-8, 2007, p.1132-1135.

Villarroya, M.; Barniol, N.; Martin, C.; Pérez-Murano, F.; Esteve, J.; Bruchhaus, L.; Jede, R.; Bourhis, E.; Gierak, J., "Fabrication of nanogaps for MEMS prototyping using focused ion beam as a lithographic tool and reactive ion etching pattern transfer", MICROELECTRONIC ENGINEERING, vol. 84, no. 5-8, 2007, p.1215-1218.

Villarroya, M.; Abadal, G.; Verd, J.; Teva, J.; Pérez-Murano, F.; Figueras, E.; Montserrat, J.; Uranga, A.; Esteve, J.; Barniol, N., "Time-Resolved Evaporation Rate of Attoliter Glycerine Drops Using On-Chip CMOS Mass Sensors Based on Resonant Silicon Micro Cantilevers", IEEE TRANS. ON NANOTECHNOLOGY, vol. 6, no. 5, 2007, p. 509-512.

Voigt, A.; Heinrich, M.; Martin, C.; Llobera, A.; Gruetzner, G.; Pérez-Murano, F., "Improved properties of hybrid epoxy nanocomposites for specific applications in the field of MEMS/NEMS", MICROELECTRONIC ENGINEERING, vol. 84, no. 5-8, 2007, p.1075-1079.



(9)

2008

Akimov, V.; Alfinito, E.; Bausells, J.; ... [et al.] "Nanobiosensors based on individual olfactory receptors". ANALOG INTEGRATED CIRCUITS AND SIGNAL PROCESSING, vol. 57, no. 3, 2008, p. 197-203.

Alonso, A., Gonzalo, J., Dominguez-Renedo, O., Muñoz, F.J., Arcos, M.J., "CYP450 biosensors based on gold chips for antiepileptic drugs determination", BIOSENSORS BIOELECTRONICS, 2008, 24 (4), p. 1733-1737.

Altet, J., Aldrete-Vidrio, E., Mateo, D., Perpiñá, X., Jordà, X., Vellvehí, M., Millán, J., Salhi, A., Grauby, S., Claeys, W., Dilhaire, S., "A heterodyne method for the thermal observation of the electrical behavior of high-frequency integrated circuits", MEAS. SCIENCE AND TECHNOLOGY, 2008, 19 (11), nº 115704 (8p.).

Arcamone, J.; van den Boogaart, M.A.F; Serra-Graells, F.; Fraxedas, J.; Brugger, J.; Pérez-Murano, F. "Full-wafer fabrication by nanostencil lithography of micro/nanomechanical mass sensors monolithically integrated with CMOS". NANOTECHNOLOGY, vol. 19, no. 30, 2008, 305302 (13pp).

Ayala, P.; Grüneis, A.; Grimm, D.; Kramberger, C.; Engelhard, R.; Ruemmeli, M.; Schumann, J.; Kaltofen, R.; Buechner, B.; Schaman, C.; Kuzmany, H.; Gemming, T.; Barreiro, A.; Pichler, T. "Cyclohexane triggers staged growth of pure and vertically aligned single wall carbon nanotubes". CHEMICAL PHYSICS LETTERS, vol. 454, no. 4-6, 2008, p. 332-336.

Baldrich, E.; Laczka, O.; Del Campo, F.J.; Muñoz, F.J. "Self-assembled monolayers as a base for immunofunctionalisation: unequal performance for protein and bacteria detection". ANALYTICAL AND BIOANALYTICAL CHEMISTRY, vol. 390, no. 6, 2008, p. 1557-1562.

Baldrich, E.; Laczka, O.; Del Campo, F.J.; Muñoz, F.J. "Gold immuno-functionalisation via self-assembled monolayers: study of critical parameters and comparative performance for protein and bacteria detection". JOURNAL OF IMMUNOLOGICAL METHODS, vol. 336, no. 2, 2008, p. 203-212.

Baldrich, E.; Muñoz, F.J. "Enzyme shadowing: using antibody-enzyme dually labelled magnetic particles for fast bacteria detection". ANALYST, vol. 133, no. 8, 2008, p. 1009-1012.

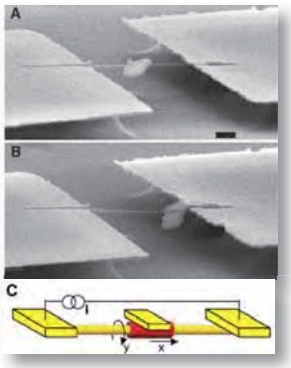
Baldrich, E.; Vigues, N.; Mas, J.; Muñoz, F.J. "Sensing bacteria but treating them well: determination of optimal incubation and storage conditions". ANALYTICAL BIOCHEMISTRY, vol. 383, no. 1, 2008, p. 68-75.

Banu, V.; Brosselard, P.; Jordà, X.; Montserrat, J.; Godignon, P.; Millán, J. "Behaviour of 1.2 kv SiC JBS diodes under repetitive high power stress". MICROELECTRONICS RELIABILITY, vol. 48, no. 8-9, 2008, p. 1444-1448.

Barhoumi, H.; Haddad, R.; Maaref, A.; Bausells, J.; Bessueille, F.; Leonard, D.; Jaffrezic-Renault, N.; Martelet, C.; Zine, N.; Errachid, A. "Na+-implanted membrane for a capacitive sodium electrolyte insulator semiconductor microsensors". SENSOR LETTERS, vol. 6, no. 1, 2008, p. 204-208.

Barreiro, A.; Rurali, R.; Hernandez, E.; Moser, J.; Pichler, T.; Forró, L.; Bachtold, A. "Subnanometer motion of cargoes driven by thermal gradients along carbon nanotubes". SCIENCE, vol. 320, no. 5877, 2008, p. 775-778. *(FIGURE 10)*

(10)



Barreto, J.; Rodríguez, J.A.; Perálvarez, M.; Morales, A.; Garrido, B.; Domínguez, C. "Photoluminescence characterization of silicon nanostructures embedded in silicon oxide". SUPERLATTICES AND MICROSTRUCTURES, vol. 43, no. 5-6, 2008, p. 588-593.

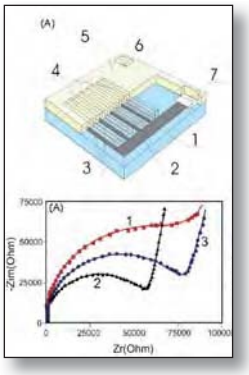
Barreto, J.; Perálvarez, M.; Morales, A.; Garrido, B.; Montserrat, J.; Domínguez, C. "Broad range adjustable emission of stacked SiNx/SiOy layers". JOURNAL OF MATERIALS RESEARCH, vol. 23, no. 6, 2008, p. 1513-1516.

Berthet-Duroure, N.; Leïchlé, T.; Pourciel, J.; Martin, C.; Bausells, J.; Lora-Tamayo, E.; Pérez-Murano, F.; François, J.; Trévisiol, E.; Nicu, L. "Interaction of biomolecules sequentially deposited at the same location using a microcantilever-based spotter". BIOMEDICAL MICRODEVICES, vol. 10, no. 4, 2008, p. 479-487.

Blanco, F.; Vilanova, X.; Fierro, V.; Celzard, A.; Ivanov, P.; Llobet, E.; Canellas, N.; Ramírez, J.L.; Correig, X. "Fabrication and characterisation of microporous activated carbon based preconcentrators for benzene vapours". SENSORS AND ACTUATORS B CHEMICAL, vol. 132, no. 1, 2008, p. 90-98.

Bratov, A.; Ramon, J.; Abramova, N.; Merlos, A.; Adrian, J.; Sánchez, F.J.; Marco, M.P.; Domínguez, C. "Three-dimensional interdigitated electrode array as a transducer for label-free biosensors". BIOSENSORS BIOELECTRONICS, vol. 24, no. 4, 2008, p. 729-735. (*FIGURE 11)*

(11)



Bratov, A.; Abramova, N.; Ramon, J.; Merlos, A.; Sánchez, F.J.; Marco, M.P.; Domínguez, C. "Characterisation of the interdigitated electrode array with tantalum silicide electrodes separated by insulating barriers". ELECTROCHEMISTRY COMMUNICATIONS, vol. 10, no. 10, 2008, p. 1621-1624.

Brosselard, P.; Camara, N.; Banu, V.; Jordà, X.; Vellvehí, M.; Godignon, P.; Millán, J. "Bipolar conduction impact on electrical characteristics and reliability of 1.2-and 3.5-kV 4H-SiC JBS diodes". IEEE TRANSACTIONS ON ELECTRON DEVICES, vol. 55, no. 8, 2008, p.1847-1856.

Cadarso, V.J.; Llobera, A.; Salinas, I.; Izquierdo, D.; Garcés, I.; Domínguez, C. "Silicon-based rectangular hollow integrated waveguides". OPTICS COMMUNICATIONS, vol. 281, no. 6, 2008, p. 1568-1575.

Cadarso, V.J.; Llobera, A.; Villanueva, G.; Domínguez, C.; Plaza, J.A. "3-D modulable PDMS-based microlens system". OPTICS EXPRESS, vol. 16, no. 7, 2008, p. 4918-4929.

Cadarso, V.J.; Llobera, A.; Villanueva, G.; Seidemann, V.; Buttgenbach, S.; Plaza, J.A. "Polymer microoptoelectromechanical systems: accelerometers and variable optical attenuators". SENSORS AND ACTUATORS A PHYSICAL, vol. 145-146, no. 1, 2008, p. 147-153.

Publications

Cadarso, V.J.; Fernández-Sánchez, C.; Llobera, A.; Darder, M.; Domínguez, C. "Optical biosensor based on hollow integrated waveguides". ANALYTICAL CHEMISTRY, vol. 80, no. 9, 2008, p. 3498-3501.

Calderón, E.; Guimerà, A.; Los, P.; Mouroux, A.; Pitts, N. "Method and device for bio-impedance measurement with hard-tissue applications". PHYSIOLOGICAL MEASUREMENT, vol. 29, no. 6, 2008, p. 244-247.

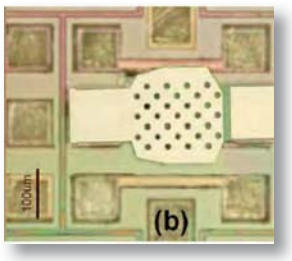
Camara, N., Rius, G., Huntzinger, J.R., Tiberj, A ., Magaud, L., Mestres, N., Godignon, P., Camassel, J., "Early stage formation of graphene on the C face of 6H-SiC", APPLIED PHYSICS LETTERS, 2008, 93 (26), 263102 (3pp).

Camara, N.; Rius, G.; Huntzinger, J.R.; Tiberj, A .; Mestres, N.; Godignon, P.; Camassel, J. "Selective epitaxial growth of graphene on SIC". APPLIED PHYSICS LETTERS, vol. 93, no. 12, 2008, 123503.

Campanella, H.; Uranga, A.; Romano-Rodríguez, A.; Montserrat, J.; Abadal, G.; Barniol, N.; Esteve, J. "Localized-mass detection based on thin-film bulk acoustic wave resonators (FBAR): area and mass location aspects". SENSORS AND ACTUATORS A PHYSICAL, vol. 142, no. 1, 2008, p. 322-328.

Campanella, H.; Nouet, P.; Uranga, A.; De Paco, P.; Barniol, N.; Esteve, J. "Automated on-wafer extraction of equivalent-circuit parameters in thin-film bulk acoustic wave resonators and substrate". MICROWAVE AND OPTICAL TECHNOLOGY LETTERS, vol. 50, no. 1, 2008, p. 4-7.

Campanella, H.; Cabruja, E.; Montserrat, J.; Uranga, A.; Barniol, N.; Esteve, J. "Thin-film bulk acoustic wave resonator floating above CMOS substrate". IEEE ELECTRON DEVICE LETTERS, vol. 29, no. 1, 2008, p. 28-30. (***FIGURE 12)***



(12)

Caramel, C.; De Maglie, R.; Austin, P.; Sanchez, J.L.; Gal, J.Le.; Imbernon, E.; Laur, J.P.; Flores, D.; Hidalgo, S.; Millán, J.; Rebollo, J. "The BI-IGBT: a low losses power structure by IGBT parallel association". SEMICONDUCTOR SCIENCE AND TECHNOLOGY, vol. 23, no. 5, 2008, 055022 (8pp).

Carreras, J.Ll.; Arbiol, J.; Garrido, B.; Bonafos, C.; Montserrat, J. "Direct modulation of electroluminescence from silicon nanocrystals beyond radiative recombination rates". APPLIED PHYSICS LETTERS, vol. 92, no. 9, 2008, 091103.

Carreras, J.Ll.; Bonafos, C.; Montserrat, J.; Domínguez, C.; Arbiol, J.; Garrido, B. "Auger quenching-based modulation of electroluminescence from ion implanted silicon nanocrystals". NANOTECHNOLOGY, vol. 19, no. 20, 2008, 205201 (9pp).

Casals-Terré, J., Duch, M., Plaza, J.A., Pérez-Castillejos, R., Vallés, E., Gómez, E., Esteve, J., "Design, fabrication and characterization of an externally actuated ON/OFF microvalve", SENSORS AND ACTUATORS A PHYSICAL, 2008, 147 (2), p. 600-606.

Cortés, I.; Fernández-Martínez, P.; Flores, D.; Hidalgo, S.; Rebollo, J. "Static and dynamic electrical performances of STI thin-SOI power LDMOS transistors". SEMICONDUCTOR SCIENCE AND TECHNOLOGY, vol. 23, no. 9, 2008, 095024(7pp).

Cortés, I.; Fernández-Martínez, P.; Flores, D.; Hidalgo, S.; Rebollo, J. "Analysis of punch-through breakdown in bulk silicon RF power LDMOS transistors". MICROELECTRONICS RELIABILITY, vol. 48, no. 2, 2008, p. 173-180.

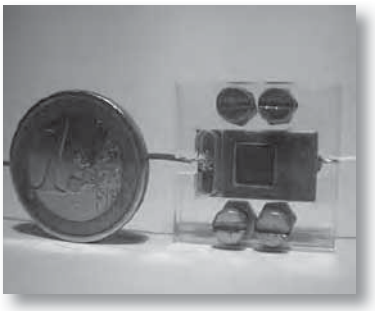
Cuadras, A.; Garrido, B.; Morante, J.R.; Fonseca, L. "Leakage currents and dielectric breakdown of $Si_{1-x-y}Ge_xC_y$ thermal oxides". MICROELECTRONICS RELIABILITY, vol. 48, no. 10, 2008, p. 1635-1640.

Dávila, D.; Esquivel, J.P.; Vigues, N.; Sánchez, O.; Garrido, L.; Tomàs, N.; Sabaté, N.; Del Campo, F.J.; Muñoz, F.J.; Mas, J. "Development and optimization of microbial fuel cells". JOURNAL OF NEW MATERIALS FOR ELECTROCHEMICAL SYSTEMS, vol. 11, no. 2, 2008, p. 99-103.

Del Campo, F.J.; García-Céspedes, J.; Muñoz, F.J.; Bertrán, E. "Vertically aligned carbon nanotube based electrodes: fabrication, characterisation and prospects". ELECTROCHEMISTRY COMMUNICATIONS, vol. 10, no. 9, 2008, p. 1242-1245.

Errachid, A.; Mills, C. A.; Pla-Roca, M.; López, M.J.; Villanueva, G.; Bausells, J.; Crespo, E.; Teixidor, F.; Samitier, J. "Focused ion beam production of nanoelectrode arrays". MATERIALS SCIENCE AND ENGINEERING C, vol. 28, no. 5-6, 2008, p. 777-780.

Esquivel, J.P.; Sabaté, N.; Santander, J.; Torres, N.; Cané, C. "Fabrication and characterization of a passive silicon-based direct methanol fuel cell". MICROSYSTEM TECHNOLOGIES, vol. 14, no. 4-5, 2008, p. 535-541. ***(FIGURE 13)***



(13)

Fernandez-Cuesta, I; Borrisé, X.; Retolaza, A.; Merino, S.; Mendels , D.; Hansen, O.; Kristensen, A.; Pérez-Murano, F. "Determination of stress build-up during nanoimprint process in triangular polymer structures". MICROELECTRONIC ENGINEERING, vol. 85, no. 5-6, 2008, p. 838-841.

Fernández-Sánchez, C.; Cadarso, V.J.; Darder, M.; Domínguez, C.; Llobera, A. "Patterning high-aspect-ratio sol–gel structures by microtransfer molding". CHEMISTRY OF MATERIALS, vol. 20, no. 8, 2008, p. 2662-2668.

Ferrari, A.C.; Skakalova, V.; Po-Wen, C.; Bachtold, A.; Golberg, D. "Science and technology of nanotubes, nanowires and graphene - preface". PHYSICA E LOW DIMENSIONAL SYSTEMS NANOSTRUCTURES, vol. 40, no. 7, 2008, p. VII-VIII.

Fonollosa, J.; Rubio, R.; Hartwing, S.; Marco, S.; Santander, J.; Fonseca, L.; Wöllenstein, J.; Moreno, M. "Design and fabrication of silicon-based mid infrared multi-lenses for gas sensing applications". SENSORS AND ACTUATORS B CHEMICAL, vol. 132, no.2, 2008, p.498-507.

Fonseca, L.; Santander, J.; Rubio, R.; Sabaté, N.; Figueras, E.; Duch, M.; Gràcia, I.; Cané, C. "Use of boron heavily doped silicon slabs for gas sensors based on free standing membranes". SENSORS AND ACTUATORS B CHEMICAL, vol. 130, no. 1, 2008, p. 538–545.

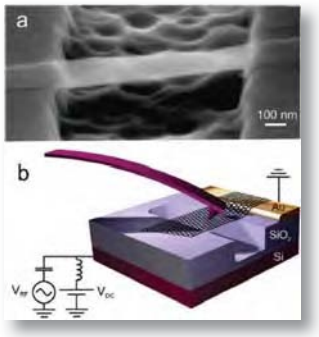
Gabriel, G.; Gómez, R.; Villa, R. "Single-walled carbon nanotubes deposited on surface electrodes to improve interface impedance". PHYSIOLOGICAL MEASUREMENT, vol. 29, no. 6, 2008, p. S203–S212.

Gammon, P.M.; Pérez-Tomàs, A.; Jennings, M.R.; Roberts, G.J.; Davis, M.C.; Shah, V.A.; Burrows, S.E.; Wilson, N.R.; Covington, J.A.;

Mawby, P.A. “Characterization of N-N Ge/SiC heterojunction diodes”. APPLIED PHYSICS LETTERS, vol. 93, no. 11, 2008, 112104.

García-Aljaro, C.; Muñoz-Berbel, X.; Jenkins, A. Toby A.; Blanch, A.R.; Muñoz, F.J. “Surface plasmon resonance assay for real-time monitoring of somatic coliphages in wastewaters”. APPLIED AND ENVIRONMENTAL MICROBIOLOGY, vol. 74, no. 13, 2008, p. 4054-4058.

García-Sanchez, D.; van der Zande, A.M.; San Paulo, A.; Lassagne, B.; McEuen, P.L.; Bachtold, A. “Imaging mechanical vibrations in suspended graphene sheets”. NANO LETTERS, vol. 8, no. 5, 2008, p. 1399-1403. *(FIGURE 14)*



(14)

Godino, N.; Dávila, D.; Vigues, N.; Ordeig, O.; Del Campo, F.J.; Mas, J.; Muñoz, F.J. “Measuring acute toxicity using a solid-state microrespirometer: part II. A theoretical framework for the elucidation of metabolic parameters”. SENSORS AND ACTUATORS B CHEMICAL, vol. 135, no. 1, 2008, p. 13-20.

Gonzalez-Guerrero, A.; Mendoza, E.; Pellicer, E.; Alsina, F.; Fernández-Sánchez, C.; Lechuga, L.M. “Discriminating the carboxylic groups from the total acidic sites in oxidized multi-wall carbon nanotubes by means of acid–base titration”. CHEMICAL PHYSICS LETTERS, vol. 462, no. 4-6, 2008, p. 256-259.

Gràcia, I.; Ivanov, P.; Blanco, F.; Sabaté, N.; Vilanova, X.; Correig, X.; Fonseca, L.; Figueras, E.; Santander, J.; Cané, C. “Influence of the internal gas flow distribution on the efficiency of a μ-preconcentrator”. SENSORS AND ACTUATORS B CHEMICAL, vol. 135, no. 1, 2008, p. 52-56.

Gràcia, I.; Ivanov, P.; Blanco, F.; Sabaté, N.; Vilanova, X.; Correig, X.; Fonseca, L.; Figueras, E.; Santander, J.; Cané, C. “Sub-ppm gas sensor detection via spiral μ-preconcentrator”. SENSORS AND ACTUATORS B CHEMICAL, vol. 132, no. 1, 2008, p. 149-154.

Hayama, K.; Ohyama, H.; Takakura, K.; Raffi, J.M.; Mercha, A.; Simoen, E.; Claeys, C. “Carrier lifetime analysis in thin gate oxide FD-SOI N-MOSFETs by gate induced drain current transients”. JOURNAL OF MATERIALS SCIENCE - MATERIALS IN ELECTRONICS, vol. 19, no. 2, 2008, p. 161-165.

Hildenbrand, J.; Wöllenstein, J.; Hartwing, S.; Eberhardt, A.; Halford, B.; Moreno, M.; Fonollosa, J.; Fonseca, L.; Santander, J.; Rubio, R.; Gràcia, I.; Cané, C. “A compact optical multichannel system for ethylene”. MICROSYSTEM TECHNOLOGIES, vol. 14, no. 4-5, 2008, p. 637-644.

Holloway, A.F.; Craven, D.A.; Xiao, L.; Del Campo, F.J.; Wildgoose, G.G. “Developing random network theory for carbon nanotube modified electrode voltammetry: introduction and application to estimating the potential drop between MWCNT-MWCNT contacts”. JOURNAL OF PHYSICAL CHEMISTRY C, vol. 112, no. 35, 2008, p. 13729–13738.

Horas, J.; Siddiki, A.; Moser, J.; Wegscheider, W.; Ludwig, S. “Investigations on unconventional aspects in the quantum Hall regime of narrow gate defined channels”. PHYSICA E LOW DIMENSIONAL SYSTEMS NANOSTRUCTURES, vol. 40, no. 5, 2008, p. 1130-1132.

Ipatov, A.; Abramova, N.; Bratov, A.; Domínguez, C. “Integrated multi-sensor chip with sequential injection technique as a base for electronic tongue devices”. SENSORS AND ACTUATORS B CHEMICAL, vol. 131, no. 1, 2008, p. 48-52.

Ipatov, A.; Abramova, N.; Bratov, A. “Autocalibration technique based on SIA and integrated multisensor chip”. TALANTA, vol. 72, no. 2, 2008, p. 581-586.

Jordà, X., Perpiñá, X., Vellvehí, M., Coleto, J., “Power-Substrate Static Thermal Characterization Based on a Test Chip“, IEEE TRANS. DEVICE AND MATERIALS RELIABILITY, 2008, 8 (4), p. 671-679.

de la Rica, R.; Baldi, A.; Mendoza, E.; San Paulo, A.; Llobera, A.; Fernández-Sánchez, C. “Silane nanopatterns via gas-phase soft lithography”. SMALL, vol. 4, no. 8, 2008, p. 1076-1079. *(FIGURE 15)*

de la Rica, R.; Fernández-Sánchez, C.; Jimenez- Jorquera, C.; Baldi, A. “Spermine-induced hybridization and charge inversion at the diffuse layer of a DNA-FET”. JOURNAL OF PHYSICAL CHEMISTRY B, vol. 112, 2008, p. 7614-7617.

Laczka, O.; Baldrich, E.; Del Campo, F.J.; Muñoz, F.J. “Immunofunctionalisation of gold transducers for bacterial detection by physisorption”. ANALYTICAL AND BIOANALYTICAL CHEMISTRY, vol. 391, no. 8, 2008, p. 2825-2835.

Laczka, O.; Baldrich, E.; Muñoz, F.J.; Del Campo, F.J. “Detection of Escherichia Coli and Salmonella Typhimurium using interdigitated microelectrode capacitive immunosensors: the importance of transducer geometry”. ANALYTICAL CHEMISTRY, vol. 80, no. 19, 2008, p. 7239-7247.

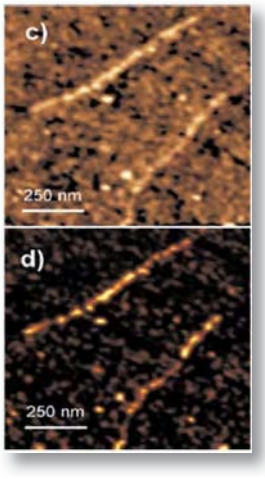
Llobera, A.; Cadarso, V.J.; Darder, M.; Domínguez, C.; Fernández-Sánchez, C. “Full-field photonic biosensors based on tunable biodoped sol–gel glasses”. LAB ON A CHIP, vol. 8, no. 7, 2008, p. 1185-1190.

Llobera, A.; Wilke, R.; Buttgenbach, S. “Enhancement of the response of poly (dimethylsiloxane) hollow prisms through air mirrors for absorbance-based sensing”. TALANTA, vol. 75, no. 2, 2008, p. 473-479.

Llobera, A.; Cadarso, V.J.; Seidemann, V.; Buettgenbach, S.; Plaza, J.A. “Optical and structural numerical simulation of SU-8: optical accelerometer”. SENSOR LETTERS, vol. 6, no. 1, 2008, p. 106-114.

López-Martínez, M.J.; Caballero, D.; Campo, E.M.; Pérez-Castillejos, R.; Errachid, A.; Esteve, J.; Plaza, J.A. “Focused ion beam-assisted technology in sub-picolitre micro-dispenser fabrication”. JOURNAL OF MICROMECHANICS AND MICROENGINEERING, vol. 18, no. 7, 2008, 075021 (8pp).

Marques de Oliveira, I.A.; Risco, D.; Vocanson, F.; Crespo, E.; Teixidor, F.; Zine, N.; Bausells, J.; Samitier, J.; Errachid, A. “Sodium ion sensitive microelectrode based on a p-tertbutylcalix[4]arene ethyl ester”. SENSORS AND ACTUATORS B CHEMICAL, vol. 130, no. 1, 2008, p. 295-299.



(15)

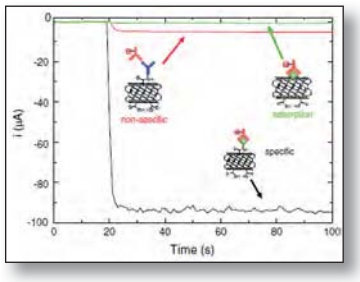
Publications

Martin, C.; Llobera, A.; Leïchlé, T.; Villanueva, G.; Voigt, A.; Fakhfouri, V.; Kim, J.Y.; Berthet-Duroure, N.; Bausells, J.; Gruetzner, G.; Nicu, L.; Brugger, J.; Pérez-Murano, F. "Novel methods to pattern polymers for microfluidics". MICROELECTRONIC ENGINEERING, vol. 85, no. 5-6, 2008, p. 972-975.

Martín, I.; Rius, G.; Atienzar, P.; Teruel, L.; Mestres, N.; Pérez-Murano, F.; García, H.; Godignon, P.; Corma, A.; Lora-Tamayo, E. "CVD oriented growth of carbon nanotubes using $AlPO_4$-5 and L type zeolites". MICROELECTRONIC ENGINEERING, vol. 85, no. 5-6, 2008, p. 1202-1205.

Mendoza, E.; Orozco, J.; Jimenez- Jorquera, C.; Gonzallez-Guerrero, A.; Calle, A.; Lechuga, L.M.; Fernández-Sánchez, C. "Scalable fabrication of immunosensors based on carbon nanotube polymer composites". NANOTECHNOLOGY, vol. 19, no. 7, 2008, 075102 (6pp). ***(FIGURE 16)***

(16)



Miñano, M.; Balbuena, J.P.; Garcia, C.; González, S.; Lacasta, C.; Lacuesta, V.; Lozano, M.; Martí, S.; Pellegrini, G.; Ullán, M. "Annealing studies of silicon microstrip detectors irradiated at high neutron fluences". NUCL. INSTR. METH. PHYS. RES. A - ACCEL. SPECTROM. DETECTORS ASSOC. EQUIP., vol. 591, no. 1, 2008, p. 181-183.

Morales, A.; Domínguez, C.; Aceves, M.; Carrillo, J. "Optical characterization of silicon rich oxide films". SENSORS AND ACTUATORS A PHYSICAL, vol. 142, no. 1, 2008, p. 1 2-18.

Morales, A.; Barreto, J.; Domínguez, C.; Aceves, M.; Yu, Z.; Luna-López, J.A. "Coulomb blockade effects in silicon nanoparticles embedded in thin silicon-rich oxide films". NANOTECHNOLOGY, vol. 19, no. 16, 2008, 165401 (5pp).

Moreno i Codinachs, L.; Baldi, A.; Merlos, A.; Abramova, N.; Ipatov, A.; Jimenez- Jorquera, C.; Bratov, A. "Integrated multisensor for FIA-based electronic tongue applications". IEEE SENSORS JOURNAL, vol. 8, no. 5, 2008, p. 608-615. ***(FIGURE 17)***

Moreno i Codinachs, L.; Kloock, J.P.; Schöning, M.J.; Baldi, A.; Ipatov, A.; Bratov, A.; Jimenez-Jorquera, C. "Electronic integrated multisensor tongue applied to grape juice and wine analysis". ANALYST, vol. 133, no. 10, 2008, p. 1440-1448.

Moser, J.; Verdaguer, A.; Jiménez, D.; Barreiro, A.; Bachtold, A. "The environment of graphene probed by electrostatic force microscopy". APPLIED PHYSICS LETTERS, vol. 92, no. 12, 2008, 123507.

Muñoz-Berbel, X.; Vigues, N.; Mas, J.; Del Valle, M.; Muñoz, F.J.; Cortina-Puig, M. "Resolution of binary mixtures of microorganisms using electrochemical impedance spectroscopy and artificial neural networks". BIOSENSORS BIOELECTRONICS, vol. 24, no. 4, 2008, p. 958-962.

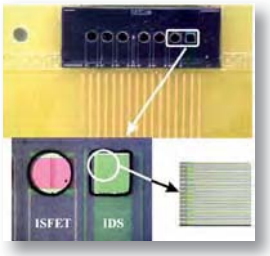
Muñoz-Berbel, X.; Vigues, N.; Mas, J.; Muñoz, F.J.; Jenkins, A. Toby A. "Impedimetric approach for quantifying low bacteria concentrations based on the changes produced in the electrode-solution interface during the pre-attachment stage". BIOSENSORS BIOELECTRONICS, vol. 23, no. 10, 2008, p. 1540-1546.

Muñoz-Berbel, X., García-Aljaro, C., Muñoz, F.J., "Impedimetric approach for monitoring the formation of biofilms on metallic surfaces and the subsequent application to the detection of bacteriophages", ELECTROCHIMICA ACTA, 2008, 53 (19), p. 5739-5744.

Nielsen, R.B., Fernandez-Cuesta, I, Boltasseva, A., Volkov, V.S., Bozhevolnyi, S.I., Klukowska, A., Kristensen, A., "Channel plasmon polariton propagation in nanoimprinted V-groove waveguides", OPTICS LETTERS, 2008, 33 (23), p. 2800-2802.

Ordeig, O.; Godino, N.; Del Campo, F.J.; Muñoz, F.J.; Nikolajeff, F.; Nyholm, L. "On-chip electric field driven electrochemical detection using a poly(dimethylsiloxane) microchannel with gold microband electrodes". ANALYTICAL CHEMISTRY, vol. 80, no. 10, 2008, p. 3622-3632.

(17)



Orozco, J.; Fernández-Sánchez, C.; Mendoza, E.; Baeza, M.; Cespedes, F.; Jimenez-Jorquera, C. "Composite planar electrode for sensing electrochemical oxygen demand". ANALYTICA CHIMICA ACTA, vol. 607, no. 2, 2008, p. 176-182.

Orozco, J.; Fernández-Sánchez, C.; Jimenez-Jorquera, C. "Underpotential deposition-anodic stripping voltammetric detection of copper at gold nanoparticle-modified ultramicroelectrode arrays". ENVIRONMENTAL SCIENCE TECHNOLOGY, vol. 42, no. 13, 2008, p. 4877-4882.

Pellegrini, G.; Lozano, M.; Ullán, M.; Bates, R.; Fleta, C.; Pennicard, D. "First double sided 3D detectors fabricated at CNM-IMB". NUCL. INSTR. METH. PHYS. RES. A - ACCEL. SPECTROM. DETECTORS ASSOC. EQUIP., vol. 592, no. 1-2, 2008, p. 38-43.

Pennicard, D.; Pellegrini, G.; Fleta, C.; Bates, R.; O'Shea, V.; Parkes, C.; Tartoni, N. "Simulations of radiation-damaged 3D detectors for the super-LHC". NUCL. INSTR. METH. PHYS. RES. SECTION A - ACCEL. SPECTROM. DETECTORS AND ASSOC. EQUIP., vol. 592, no. 1-2, 2008, p. 16-25.

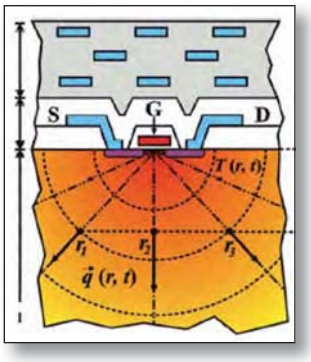
Perálvarez, M.; Carreras, J.Ll.; Barreto, J.; Morales, A.; Domínguez, C.; Garrido, B. "Efficiency and reliability enhancement of silicon nanocrystal field effect luminescence from nitride-oxide gate stacks". APPLIED PHYSICS LETTERS, vol. 92, no. 24, 2008, 241104.

Pérez-Tomàs, A.; Jennings, M.R.; Gammon, P.M.; Roberts, G.J.; Mawby, P.A.; Millán, J.; Godignon, P.; Montserrat, J.; Mestres, N. "SiC MOSFETs with thermally oxidized Ta_2Si stacked on SiO_2 as high-k gate insulator". MICROELECTRONIC ENGINEERING, vol. 85, no. 4, 2008, p.704-709.

Pérez-Tomàs, A.; Jennings, M.R.; Mawby, P.; Millán, J.; Godignon, P.; Montserrat, J.; Rossinyol, E.; Vennegues, P.; Stoemenos, J. "Interfacial properties of thermally-oxidized Ta_2Si on Si". SURFACE AND INTERFACE ANALYSIS, vol. 40, no. 8, 2008, p. 1164-1167.

Pérez-Tomàs, A.; Brosselard, P.; Hassan, J.; Jordà, X.; Godignon, P.; Placidi, M.; Constant, A.; Millán, J.; Bergman, J.P. "Schottky versus bipolar 3.3 kV SiC diodes". SEMICONDUCTOR SCIENCE AND TECHNOLOGY, vol. 23, no. 12, 2008, 125004 (7pp).

Perpiñá, X.; Altet, J.; Jordà, X.; Vellvehí, M.; Millán, J.; Mestres, N. "Hot-spot detection in integrated circuits by substrate heat-flux sensing". IEEE ELECTRON DEVICE LETTERS, vol. 29, no. 10, 2008, p. 1142-1144. ***(FIGURE 18***)

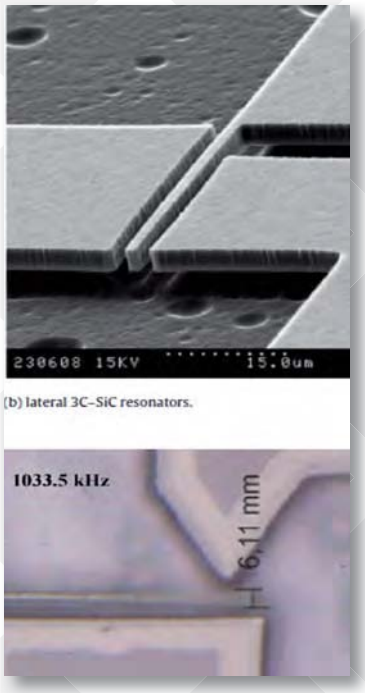


(18)

Perpiñá, X.; Serviere, J.F.; Jordà, X.; Fauquet, A.; Hidalgo, S.; Urresti, J.; Rebollo, J.; Mermet-Guyennet, M. "IGBT module failure analysis in railway applications". MICROELECTRONICS RELIABILITY, vol. 48, no. 8-9, 2008, p. 1427-1431.

Perpiñá, X.; Jordà, X.; Vellvehí, M.; Altet, J.; Mestres, N. "Steady-state sinusoidal thermal characterization at chip level by internal infrared-laser deflection". JOURNAL OF PHYSICS D APPLIED PHYSICS, vol. 41, no. 15, 2008, 155508 (4pp).

Placidi, M.; Godignon, P.; Mestres, N.; Abadal, G.; Ferro, G.; Leycuras, A.; Chassagne, T. "Fabrication of monocrystalline 3C-SiC resonators for MHz frequency sensors applications". SENSORS AND ACTUATORS B CHEMICAL, vol. 133, no. 1, 2008, p. 276-280. ***(FIGURE 19)***



(19)

Ricart, J.; Pons, J.; Dominguez, M.; Rodríguez, A.; Figueras, E.; Horrillo, M.C.; Gutiérrez, J.; Sayago, I. "Application of pulsed digital oscillators to volatile organic compounds sensing". SENSORS AND ACTUATORS B CHEMICAL, vol. 134, no. 2, 2008, p. 773-779.

Rius, G.; Verdaguer, A.; Chaves, F.A.; Martín, I.; Godignon, P.; Lora-Tamayo, E.; Jiménez, D.; Pérez-Murano, F. "Characterization at the nanometer scale of local electron beam irradiation of CNT based devices". MICROELECTRONIC ENGINEERING, vol. 85, no. 5-6, 2008, p. 1413-1416.

Ruiz-Morales, J.C., Canales-Vázquez, J., Marrero-López, D., Peña-Martínez, J., Tarancón, A., Irvine, John T. S., Núñez, P., "Is YSZ stable in the presence of Cu?", JOURNAL OF MATERIALS CHEMISTRY, 2008, 18 p. 5072-5077.

Sabaté, N.; Esquivel, J.P.; Santander, J.; Torres, N.; Gràcia, I.; Ivanov, P.; Fonseca, L.; Figueras, E.; Cané, C. "Passive direct methanol fuel cells in silicon technology". JOURNAL OF NEW MATERIALS FOR ELECTROCHEMICAL SYSTEMS, vol. 11, no. 2, 2008, p. 143-146.

Sacristán, J.; Segura, F.; Osés, T. "Simple and efficient inductive telemetry system with data and power transmission". MICROELECTRONICS JOURNAL, vol. 39, no. 1, 2008, p. 103-111.

Savu, V.; van den Boogaart, M.A.F; Brugger, J.; Arcamone, J.; Sansa, M.; Pérez-Murano, F. "Dynamic stencil lithography on full wafer scale". JOURNAL OF VACUUM SCIENCE AND TECHNOLOGY B –MICROELECTRONICS PROCESSING AND PHENOMENA, vol. 26, no. 6, 2008, p. 2054-2058.

Segura,F.; García-Cantón,J.; Sacristán,J.; Osés, T.; Baldi, A. "Wireless powering of single-chip systems with integrated coil and external wire-loop resonator". APPLIED PHYSICS LETTERS, vol. 92, no. 7, 2008, 074102. ***(FIGURE 20)***

Torres, N.; Santander, J.; Esquivel, J.P.; Sabaté, N.; Figueras, E.; Ivanov, P.; Fonseca, L.; Gràcia, I.; Cané, C. "Performance optimization of a passive silicon-based micro-direct methanol fuel cell". SENSORS AND ACTUATORS B CHEMICAL, vol. 132, no. 2, 2008, p. 540-544.

Udina, S.; Carmona, M.; Carles, G.; Santander, J.; Fonseca, L.; Marco, S. "A micromachined thermoelectric sensor for natural gas analysis: thermal model and experimental results". SENSORS AND ACTUATORS B CHEMICAL, vol. 134, no. 2, 2008, p. 551-588.

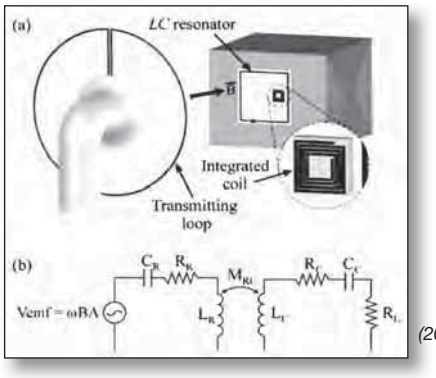
Vallejos, S.; Khatko, V.; Calderer, J.; Gràcia, I.; Cané, C.; Llobet, E.; Correig, X. "Micromachined WO_3-based sensors selective to oxidizing gases". SENSORS AND ACTUATORS B CHEMICAL, vol. 132, no. 1, 2008, p. 209-215.

Verd, J.; Uranga, A.; Abadal, G.; Teva, J.; Torres, F.; López, J.; Pérez-Murano, F.; Esteve, J.; Barniol, N. "Monolithic CMOS MEMS oscillator circuit for sensing in the attogram range". IEEE ELECTRON DEVICE LETTERS, vol. 29, no. 2, 2008, p. 146-148.

Villanueva, G.; Plaza, J.A.; Montserrat, J.; Pérez-Murano, F.; Bausells, J. "Crystalline silicon cantilevers for piezoresistive detection of biomolecular forces". MICROELECTRONIC ENGINEERING, vol. 85, no. 5-6, 2008, p. 1120-1123.

Zekentes, K.; Camara, N.; Basanets, W.; Boltovets, M.; Kryvutsa, V.; Orechovskij, V.O.; Simonchuk, V.I.; Zorenko, A.V.; Bano, E. "Microwave modulators based on 4H-SiC P-I-N diodes". IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES, vol. 56, no. 4, 2008, p. 803-808.

Zinoviev, K.; Domínguez, C.; Plaza, J.A.; Lechuga, L.M. "Optical waveguide cantilever actuated by light". APPLIED PHYSICS LETTERS, vol. 92, no. 1, 2008, 011908.



(20)

Ph. D. Thesis

Arcamone, Julien
Integration of nanomechanical sensors on CMOS by nanopatterning methods
Pérez-Murano, F., Brémond, G. (dir.). Serra-Mestres, F. (tutor).
Universitat Autònoma de Barcelona, Dept. Electronic Engineering, 2007.

Bigas, Marc
Integració 3D de detectors de píxels híbrids
Cabruja, E.; Forest, J. (dir.).
Universitat de Girona, Dept. Engineering, 2007.

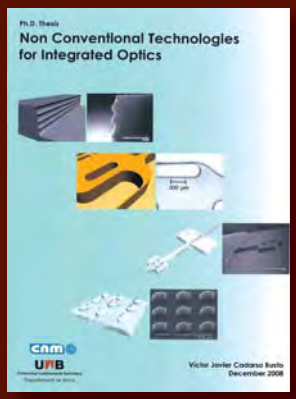
de la Rica, Roberto
New concepts for electrical detection of biomolecules
Baldi, A., Fernández, C. (dir.). Farrés, J.(tutor).
Universitat Autònoma de Barcelona, Dept. Biochemistry and Molecular Biology, 2007.

Moreno, Lia
Desenvolupament d'una llengua electrònica basada en un multisensor integrat i la seva aplicació en mostres de begudes
Bratov, A.; Jimenez, C. (dir.). Alonso, J.(tutor).
Universitat Autònoma de Barcelona, Dept. Chemistry, 2007.

Ordeig, Olga
Thin film based disc microelectrode arrays in water toxicity control
del Campo, F.J.; Muñoz, F.J. (dir.).
Universitat Politècnica de Catalunya, Dept. Chemical Engineering, 2007.

Rubio, Rafael
Nueva arquitectura para un nuevo analizador compacto de gases basado en una matriz de microsensores de infrarrojo no específicos
Marco, S., Fonseca, L. (dir.).
Universitat de Barcelona, Dept. Electronics, 2007.

Sacristán, Jordi
Sistema implantable para la estimulación y registro de nervio periférico
Osés, T.; Serra-Graells, F. (dir.). Serra-Mestres, F.(tutor).
Universitat Autònoma de Barcelona, Dept. Electronic Engineering, 2007.



Cadarso, Victor Javier
Non conventional technologies for integrated optics
Domínguez, C.; Llobera, A. (dir.). Yzuel Giménez, Mª.J.(tutor).
Universitat Autònoma de Barcelona, Dept. Physics, 2008.

Campanella, Humberto

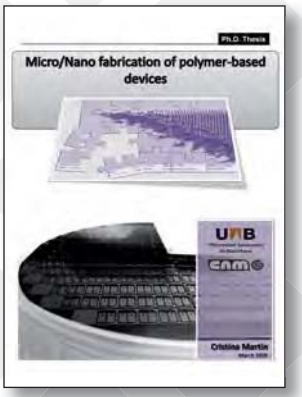
Thin-film bulk acoustic wave resonators (FBAR): fabrication, heterogeneous integration with CMOS technologies and sensor applications

Esteve, J.; Uranga, A.; Nouet, P. (dir.). Universitat Autònoma de Barcelona, Dept. Electronic Engineering, 2008.

López, Mª José

MicroNanoHerramientas para las Ciencias de la Vida

Plaza, J.A. (dir.). Peral Pérez, J.(tutor). Universitat Autònoma de Barcelona, Dept. Chemistry, 2008.



Martín, Cristina

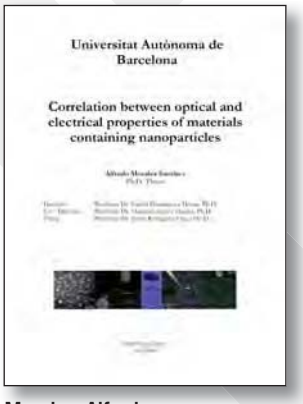
Micro/nano fabrication of polymer-based devices

Pérez-Murano, F.; Llobera, A. (dir.). Jiménez, D.(tutor). Universitat Autònoma de Barcelona, Dept. Electronic Engineering, 2008.

Martín, Mª Elena

A CMOS pixel vertex detector for the super KEK-B experiment semiconductor tracker

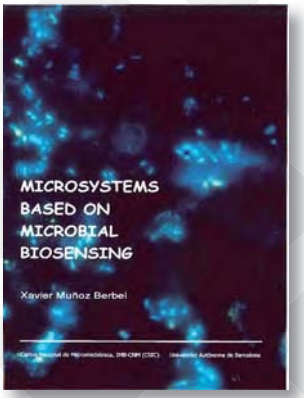
Varner, G.S.; Ferrer, C. (dir.). Universitat Autònoma de Barcelona, Dept. Microsystems and Electronic Systems, 2008.



Morales, Alfredo

Correlation between optical and electrical properties of materials containing nanoparticles

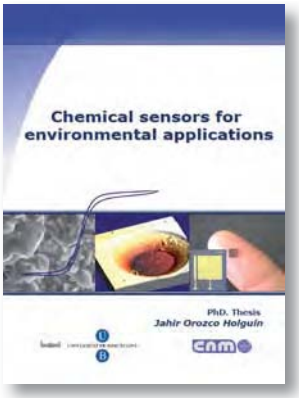
Domínguez, C.; Aceves, M. (dir.). Rodríguez-Viejo, J.(tutor). Universitat Autònoma de Barcelona, Dept. Physics, 2008.



Muñoz-Berbel, Xavier

Microsystems based on microbial biosensing

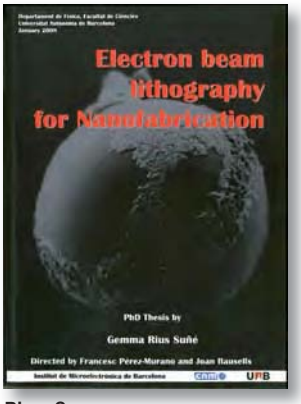
Muñoz, F.J. (dir.). Farrés, J.(tutor). Universitat Autònoma de Barcelona, Dept. Biochemistry, 2008.



Orozco, Jahir

Chemical sensors for environmental applications

Jiménez-Jorquera, C., Fernández-Sánchez, C. (dir.), Vidal M. (tutor). Universitat de Barcelona, Dept. Analytical Chemistry, 2008.



Rius, Gemma

Electron beam lithograhy for nanofabrication

Pérez-Murano, F.; Bausells, J. (dir.), Pascual, J.(tutor). Universitat Autònoma de Barcelona, Dept. Physics, 2008.

Urresti, Jesús

Modelización y fabricación de dispositivos supresores TVS para protección en aplicaciones de baja tensión

Hidalgo, S. (dir.), Suñé, J. (tutor). Universitat Autònoma de Barcelona, Dept. Electronic Engineering, 2008.

Patents

1. Owner: Consejo Superior de Investigaciones Científicas (CSIC).
Title: Biosensor y sus aplicaciones.
Authors: Bratov, A., Domínguez, C., Abramova, N., Merlos, A., Ramon, J., Sánchez, F.J., Marco, M.P.
Ref.: Spain, appl. 200701253, 2007.

2. Owner: CSIC
Title: Thin-film bulk acoustic wave resonator and method for performing heterogeneous integration of the same with complementary-metal-oxide-semiconductor integrated circuit.
Authors: Campanella, H.; Esteve, J.; Cabruja, E.; Montserrat, J.; Terés, L.; Carmona, M.
Ref.: European Patent Office, appl. 07380041.9-1233, 2007.

3. Owner: CSIC, UAB.
Title: Dispositivo intracelular para el estudio de parámetros intracelulares en células, órganos y tejidos.
Authors: Esteve, J., Plaza, J.A., Gómez, R., Duch, M., Fernández, E., de la Rosa, E., Vázquez, P., Boya, P., Sánchez, F.J., Marco, M.-P., Gonzalez-Pinacho, D., Muriano, A., Nogués, C., Barrios, L., Ibañez, E.
Ref.: Spain, appl. P200702623, 2007.

4. Owner: CSIC.
Title: Interferometer and sensor based on bimodal optical waveguide and sensing method.
Authors: Zinoviev, K.; Lechuga, L.M.; Domínguez, C.
Ref.: European Patent Office, appl. EP07381053.3, 2007.

5. Owner: Teknoflow OY, CSIC
Title: Radiation Detector, Method of manufacturing a radiation detector and use of the detector for measuring radiation.
Authors: F. García, M. Lozano, R. Orava, G. Pellegrini.
Ref.: Finland, appl. 20070939, 2007 (Int. PCT: WO 2009/071587 A3).

6. Owner: CSIC.
Title: Dispositivo de lectura de microarrays de tipo eléctrico y reutilizable.
Authors: Baldi, A.; Fernández-Sánchez, C.; de la Rica, R.; Bonilla, D.
Ref.: Spain, appl. P200802068, 2008.

7. Owner: CSIC.
Title: Dispositivo microelectrónico basado en redes de microelectrodos de disco y anillo, y método de fabricación del mismo.
Authors: Del Campo, F.J.; Muñoz, F.J.
Ref.: Spain, appl. P200803221, 2008.

8. Owner: CSIC.
Title: Membrana de electrolito polimérico híbrida y sus aplicaciones.
Authors: Esquivel, J.P.; Sabaté, N.; Santander, J.; Torres, N.; Gràcia, I.; Cané, C.; Tarancón, A.; Acero, M.C.
Ref.: Spain, appl. P200801838, 2008.

9. Owner: CSIC, UB.
Title: Procedimiento y sistema para detectar y/o cuantificar bacteriófagos susceptibles de infectar una cepa huesped bacteriana predeterminada, uso de un dispositivo microelectrónico sensor para determinar dichos bacteriófagos y dispositivo microelectrónico sensor para llevar a cabo dicho procedimiento.
Authors: García-Aljaro, C., Muñoz, F.J., Blanch, A.R., Muñoz-Berbel, X.
Ref.: Spain, appl. P200800776, 2008.

10. Owner: CSIC, UB.
Title: Procedimiento y sistema para detectar y/o cuantificar bacteriófagos, uso de un dispositivo microelectrónico sensor para detectar dichos bacteriófagos y dispositivo microelectrónico sensor para llevar a cabo dicho procedimiento.
Authors: García-Aljaro, C., Muñoz-Berbel, X., Blanch, A.R., Muñoz, F.J.
Ref.: Spain, appl. P200801007, 2008.

11. Owner: CSIC.
Title: Máscaras metálicas auto alineadas para depositar de modo selectivo, capas finas sobre dispositivos y substratos microelectrónicos y método de empleo.
Authors: Jordà, X., Perpiñá, X., Vellvehí, M., Sanchez-Sanchez, D., Godignon, P.
Ref.: Spain, appl. P200800192, 2008.

12. Owner: CSIC.
Title: Método para definir y fabricar motivos superficiales nanométricos químico reactivos mediante litografía blanda en fase gaseosa, motivos y dispositivos así obtenidos y sus aplicaciones.
Authors: de la Rica, R.; Fernández-Sánchez, C.; Baldi, A.; Domínguez, C.; Jimenez- Jorquera, C.
Ref.: Spain appl. P200800221, 2008.

13. Owner: CSIC, UAB.
Title: Biosensor para la detección de anticuerpos anti-VIH.
Authors: Laczka, O., Muñoz, F.J., Ferrer-Miralles, N., Ferraz, R.M., Villaverde, A., Del Campo, F.J.
Ref.: Spain, appl. P200802551, 2008.

14. Owner: CSIC, UAB.
Title: Dispositivo y procedimiento para medir concentración de biomasa y uso de un elemento electrónico chip para medir dicha concentración de Biomasa.
Authors: Muñoz-Berbel, X., Muñoz, F.J., Mas, J., Vigues, N., Escudé-Pujol, R., Del Campo, F.J.
Ref.: Spain, appl. P200800109, 2008.

15. Owner: CSIC, EPFL, UAB.
Title: Sistema de alineación de patrones en un sustrato mediante litografía por estencil.
Authors: Pérez-Murano, F., Arcamone, J., Sansa, M., Brugger, J., van den Boogaart, M.A.F, Barniol, N., Abadal, G., Uranga, A., Verd, J.
Ref.: Spain, appl. P200802208, 2008.

16. Owner: CSIC.
Title: Circuito integrado para la lectura digital de sensores de imagen de alta velocidad.
Authors: Serra-Graells, F., Margarit, J.M., Terés, L.
Ref.: Spain, appl. P200801428, 2008.

17. Owner: CSIC and others.
Title: Lente de contacto sensora, sistema para la monitorización no invasiva de la presión intraocular y método para su medida.
Authors: Veciana, J.; Rovira, C.; Mas-Torrent, M.; Villa, R.; Aguiló, J.; Pastor, J.C.; Ussa, F.; Laukhina, E.; Laukhin, V.
Ref.: Spain, appl. P200801722, 2008.

18. Owner: CSIC.
Title: Método de fabricación de dispositivos RB-IGBT.
Authors: Vellvehí, M., Jordà, X., Gálvez, J.L., Godignon, P., Perpiñá, X.
Ref.: Spain, appl.P200800799, 2008.

19. Owner: CSIC.
Title: Acoplador de red de difracción, sistema y procedimiento.
Authors: Zinoviev, K., Domínguez, C., Lechuga, L.M.
Ref.: Spain, appl. P200801236, 2008.

20. Owner: Seiko Epson Corporation.
Title: Biasing circuit and method for voltage controlled oscillators.
Authors: Redondo, X.; Tanaka, K.; Gil, I.; Cairo, J; Terés, L.; Serra-Graells, F.; Pallarès, J.
Ref.: European Patent Office, appl. 08100629.8-1233, 2008.

21. Owner: Seiko Epson Corporation.
Title: Charge pump circuit and method.
Authors: Redondo, X.; Pallarès, J.; Serra-Graells, F.; Terés, L.; Cairo, J; Gil, I.; Tanaka, K.
Ref.: European Patent Office, appl. 08102476.2-2206, 2008.

22. Owner: Seiko Epson Corporation.
Title: Digital accumulator with configurable resolution and Sigma-Delta modulator comprising it.
Authors: Redondo, X.; Pallarès, J.; Serra-Graells, F.; Terés, L.; Cairo, J; Gil, I.; Tanaka, K.
Ref.: European Patent Office, appl. 08157419.6-2206, 2008.

Outreach

IMB has an increasing activity in outreach events aiming at promoting the society awareness of the benefits of science and specifically of micro/nano-electronics, and the public support of science and technology. A programme of visits from high school students is on-going to encourage young people to follow science and technology careers. IMB participates in the annual Science and Technology week in Spain and regularly presents the results of its research work in public media.

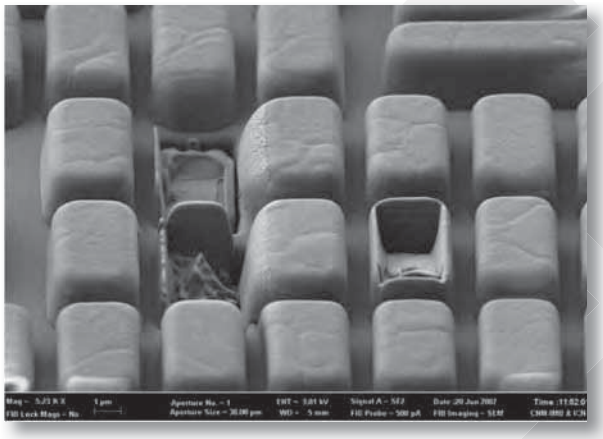
Microelectronics Museum Area

The Zenon Navarro Microelectronics Museum area has been set up to disseminate microelectronics technology and its applications, by showing equipment used for the design, fabrication or measurement of electronic devices. The equipment on display has been used by IMB-CNM on its R&D projects. The museum includes multimedia material and device prototypes.

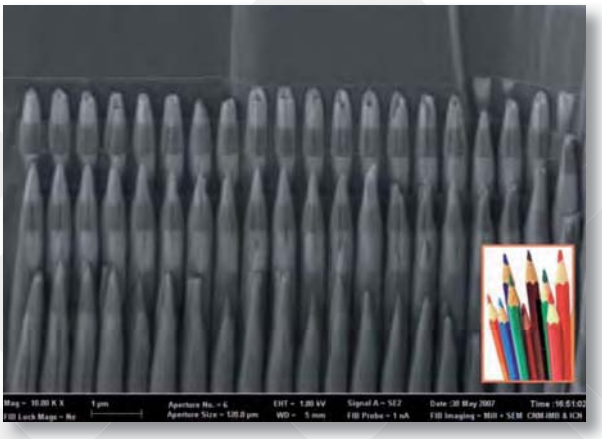
Zenon Navarro (1947-2007)

The Museum is dedicated to Zenon Navarro Garriga, physicist, who in the early 1980s built the original UAB clean room, which was used by CNM during its initial years. He later managed the building and installation of the IMB-CNM clean room and during many years he was the photolithography process manager. A degenerative illness didn't prevent him from working until the very end and sharing with everybody at IMB his deep knowledge of technology and his particular but clear-sighted view of many other life issues.

Spanish Scientific Photograph Contest 2007

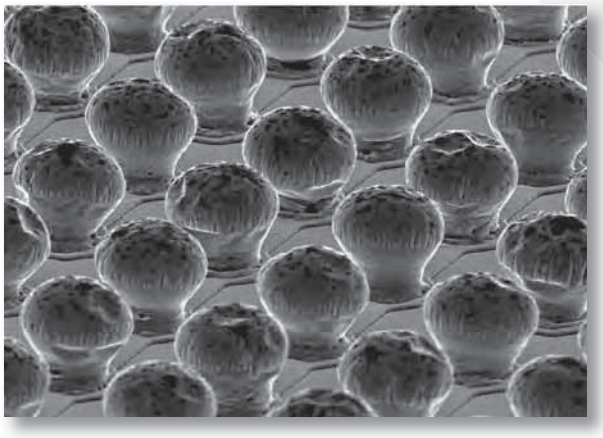


Selected work:
Desecration (FIB localized etching of metal structures on a chip).
Justo Sabadell, Jordi Llobet, Xavier Borrisé.

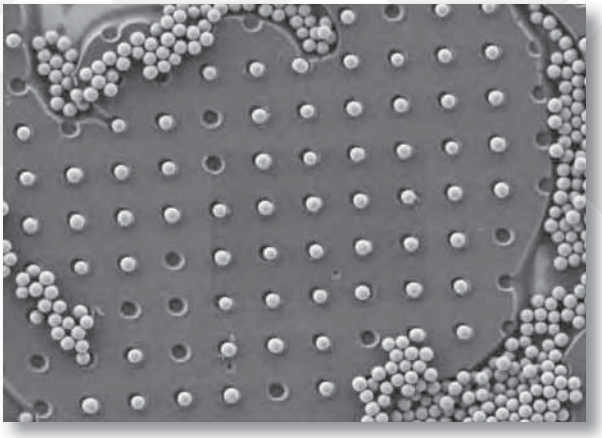


Selected work:
Nano-pencils (Localized sputtering effects during FIB etching of a multi-metal chip).
Justo Sabadell, Jordi Llobet, Xavier Borrisé.

Spanish Scientific Photograph Contest 2008



Selected work:
Alien's nest (Failed tin-lead bumps).
Enric Cabruja.



Selected work:
Marbles (Latex nanoparticles - 300 nm diameter- over a nanoimprint-structured polymeric layer).
Irene Fernández-Cuesta.

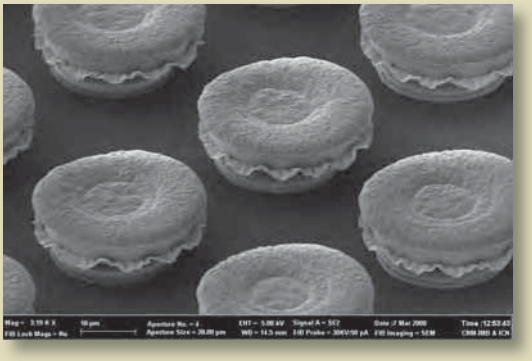
EIPBN 2007

EIPBN 2007 *- 51th Int. Conf. on Electron, Ion and Photon Beam Technology and Nanofabrication, Denver, CO, USA.*

Best electron micrograph Award ***Irene Fernández-Cuesta, IMB-CNM***
Title: *Gaudi's Sagrada Familia*

Description: *Polymeric structure, after "trying" to clean the sample.*

34th Int. Conf. on Micro & Nano Engineering, 2008



34th Int. Conf. on Micro & Nano Engineering, 2008*, Athens, Greece*

Micro & nanograph Contest - 1st prize
Jordi Llobet, IMB-CNM and Laura Barrachina, Baolab.

Title: *Nano Burguers with lettuce.*

Description: *Vertical test structures, built with 3 metal layers.*

Partnerships

IMB-CNM has specific partnerships and collaborations with industry, universities and research centres to better address the scientific and technological challenges.

IMB-CNM is a member of the Barcelona Nanotechnology Cluster-Bellaterra (BNC-b). BNC-b is a scientific and industrially oriented virtual entity, grouping the capabilities and expertise in nanoscience and nanotechnology of a number of research centres and companies located in the Research Park of Universitat Autònoma de Barcelona (UAB) at Bellaterra:

bnc-b
BARCELONA NANOTECHNOLOGY CLUSTER-BELLATERRA

· Centre d'Investigació en Nanociència i Nanotecnologia, CIN2 (CSIC-ICN)
· Institut de Ciència de Materials de Barcelona, ICMAB (CSIC)
· Various Departments of Universitat Autònoma de Barcelona, UAB
· Centre Nacional de Microelectrònica, IMB-CNM (CSIC)
· MATGAS 2000, A.I.E.
· D+T Microelectrónica, A.I.E.

BNC-b currently includes a total of more than 450 researchers.

www.bnc-b.net

The UAB Research Park is a non-profit private foundation, created in 2007 by three research institutions, the Autonomous University of Barcelona (UAB), the Spanish Research Council (CSIC) and the Agrofood Research and Technology Institute (IRTA), as a basic tool to promote the transfer of knowledge and technology between the academic community and the industry. It gathers the research capabilities located at the UAB campus, and it currently includes 30 research centres and institutes with more than 4000 researchers.

CSIC
IRTA
UAB
Parc de Recerca
UAB

parc.uab.cat

D+T Microelectrónica A.I.E. is an Association of Economic Interest which provides access for industry (especially SMEs) to the micro and nanotechnologies of IMB-CNM. It is located in the IMB-CNM building, and its mission is to facilitate the incorporation of microelectronic technologies in industrial products, designing, developing and manufacturing chips and microsystems tailored to specific needs.

D+T Microelectrónica, A.I.E.

www.cnm.es/dt

Associated Units

CNM-IMB has special collaborations with a number of research groups from Spanish Universities and technological centres, through "Associated Unit" agreements with the Spanish Research Council (CSIC):

- Electronic Materials and Engineering Group, Department of Electronics, University of Barcelona (UB), since 1998.
- Group of Semiconductor Devices, Department of Electronic Engineering, Polytechnical University of Catalonia (UPC), since 1998.
- Group of Electronic Circuits and Systems, Department of Electronic Engineering, Autonomous University of Barcelona (UAB), since 2002.
- Sensor & Biosensor group, Department of Chemistry, Autonomous University of Barcelona (UAB), since 2002.
- Institute for Systems based on Optoelectronics and Microtechnology (ISOM), Politechnical University of Madrid (UPM), since 2002.
- Inasmet-Tecnalia technological centre, San Sebastián, Spain, since 2007.

Research consortiums

IMB-CNM participates in international research consortiums and in public-private partnerships within the framework of Joint Technology Initiatives such as ENIAC (the European Nanoelectronics Initiative Advisory Council), the Framework Programmes for research and technological development of the European Union, pan-European networks such as EUREKA and other initiatives such as the European Research Council.

IMB-CNM is a member of EPoSS (the European Technology Platform on Smart Systems Integration), Photonics 21 (the Technology Platform for Photonics in Europe) and EPIC (the European Photonics Industry Consortium). It is one of the promoters of Génesis-Red (the Spanish Technology Platform on Nanoelectronics and Smart Systems Integration), and participates through it in the Forum of Stakeholders of ENIAC.

Researchers from IMB-CNM are members of CERES (Space Studies and Research Center) of UAB, which is a unit of IEEC (Institute for Space Studies of Catalonia).

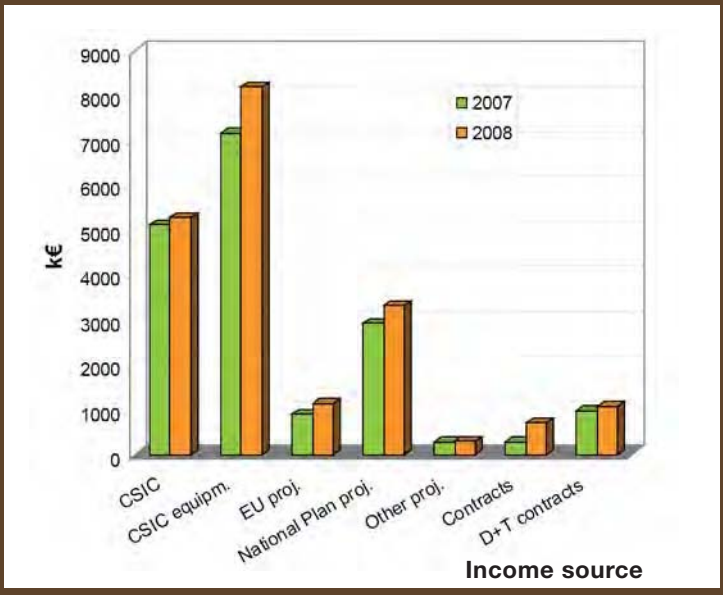
National collaborative research projects are performed within the framework of the National Plans for R+D+I.

Key Figures

STAFF - End 2008	Female	Male	Total
Researchers	13	50	63
Students	18	23	41
Clean room facility	10	23	33
Support services	3	18	21
Administration & general services	11	7	18
Visitors	0	3	3
TOTAL	**55**	**124**	**179**

During 2007-2008 IMB-CNM has been following the Stategic Plan 2005-2009, which defines the overall budget, the new human resources provided by CSIC, and objectives for external funding and scientific productivity.

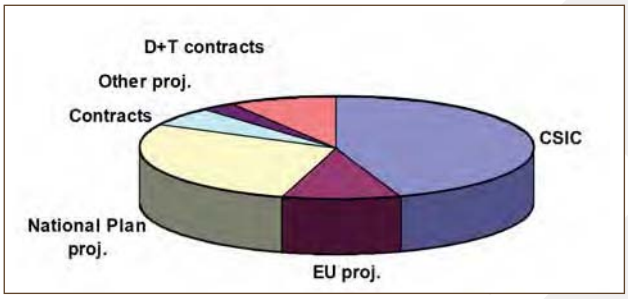
A new Action Plan for the period 2010-2013 has been prepared during the second half of 2008.



Budget

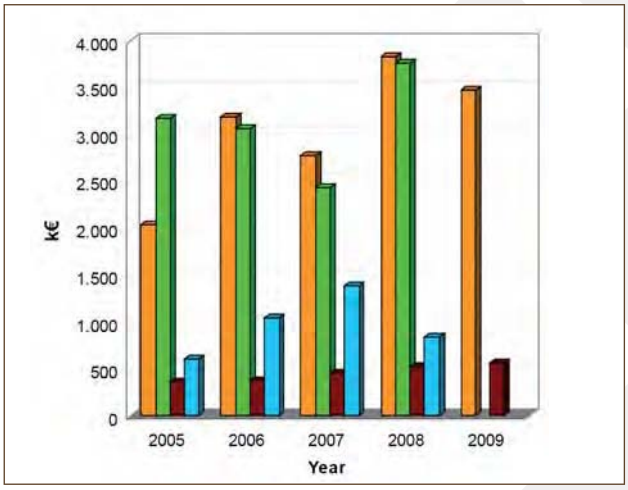
During 2007 and 2008 the budgets included a special action from CSIC for clean room equipment acquisition.

Total 2007: 17657 k€
Total 2008: 20003 k€



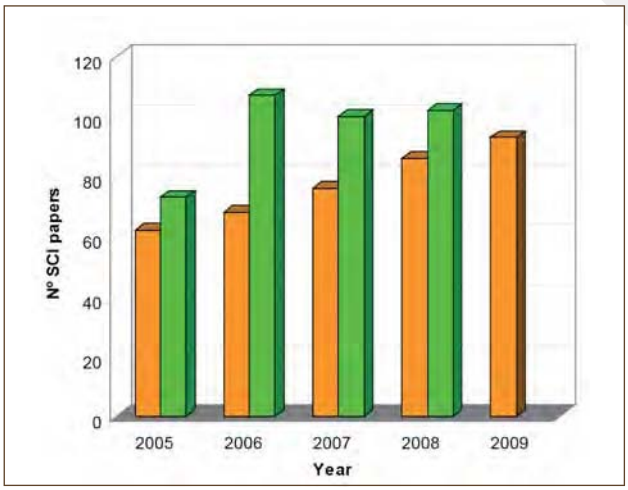
Budget distribution

Income distribution (for year 2008) excluding the CSIC special action for equipment acquisition.

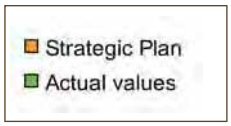


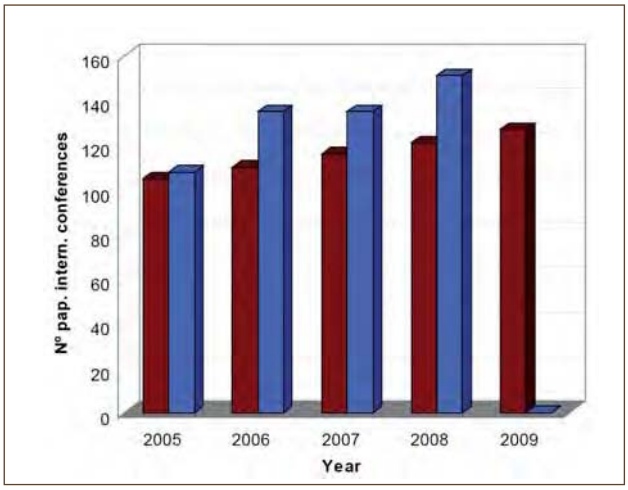
External Funding

External funding from competitive public projects and industrial contracts, in the context of the 2005-2009 Strategic Plan.

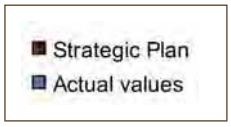


Papers in SCI journals





Papers in international conferences



www.imb-cnm.csic.es

CSIC
Consejo Superior de Investigaciones Científicas

Centro Nacional de Microelectrónica
IMB

IMB-CNM Instituto de Microelectrónica de Barcelona - Centro Nacional de Microelectrónica
Campus Universitat Autònoma de Barcelona · 08193 Bellaterra (Barcelona) · SPAIN
Tel. (+34) 93 594 77 00 · Fax (+34) 93 580 14 96