

Organization



Main research lines:

- Integrated circuits and systems
- > Micro and nanotechnologies
- > Micro-Nano-Biosystems
- > Nanofabrication and functional properties of nanostructures
- > Power devices and systems
- > Transducers for chemical and biochemical sensing

IMB-CNM





has an integrated micro and nanofabrication clean room, with a total surface of 1500 m². It has the capability of fabricating CMOS integrated circuits and includes microsystems-specific and nanofabrication processes.

The clean room and its complementary laboratories are recognized as one of the "Singular Scientific and Technological Infrastructures" (ICTS) by the Spanish Government.

The process quality (in terms of reliability and repeatability which are of great importance for fabrication, innovation and research objectives) is guaranteed by:

- The strict compliance of established protocols.
- Use of advanced equipment.
- Technical staff experience and expertise.









Contact

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IMB Barcelona Microelectronics Institute





Centro Nacional de Microelectrónica IMB

National Microelectronics Center

The National Microelectronics Center (CNM) was created in 1985. Barcelona Microelectronics Institute (IMB) is located in Bellaterra ne Barcelona, and has a staff of about 180 people (2008). It is a researce institute of the Spanish National Research Council (CSIC).

The main activity of IMB-CNM is research and development main oriented towards applied research in the fields of silicon-based micro and nano technologies, devices and systems. The R&D activities are mainly driven by competitive research projects funded by institutions such as the European Union, through the Framework Programmes for research and technological development, and the Spanish Ministry of Science and Innovation through the National R+D+i Plan.

Additional activities include industrial R+D+I contracts (technical and consulting services, technological and pre-industrial research, technology transfer, design and fabrication of prototypes and small series), and postgraduate and industrial training.







Micro/Nano Integrated Systems

he research activities of IMB-CNM are dedicated to Micro/Nano Integrated Systems: miniaturized electronic systems which include sensing and/or actuating capabilities in addition to electronic information processing, power management and external interfaces

The core of the IMB-CNM research can be included into the "More than Moore" and the "Heterogeneous integration" internationally established technology domains, although some of the activities can be integrated into the "Beyond CMOS" and "More Moore" areas.

Integrated circuits and systems

Analog, digital & RF CMOS design and test of inte grated circuits and systems to improve and exploit the nano/micro-technologies for advanced applications:

- > 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 and Nanotechnologies

New processes, devices and sensors for integrated circuits, MEMS, NEMS and Smart Systems, mainly using silicon based micro-nano technologies:

- Processes and Micro-NanoElectronic technologies and their integration (Ultra thin dielectrics (ALD), advanced packaging, 3D devices. ...)
- Nano-systems, sensors, NMEMS (Nano-tools, gas sensors, radiation detectors, u-fuel cells, ...)
- Application-oriented Smart Systems and subsystems for various fields: medical, environment, food, energy, telecom, high energy physics, etc.







New functional micro and nanosensors and complex and compact miniaturized systems for biological and biomedical applications:

Micro-Nano **Biosystems**

> Rapid methods in microbiology based on microbial biosensing.

Microelectrode and nanoelectrode arrays for advanced bioelectroanalysis: bioMEMS. > **Biomonitoring** based on micro-nanoelectrodes.

Nanofabrication and functional properties of nanostructures

New functional properties and fabrication methods for nanostructures enabling the development of devices with performances at their fundamental limits or based on new concepts:

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

Power devices and systems

Innovative technologies of power devices and systems for efficiency improvements and energy consumption reduction, with emphasis on automotive, transport, aerospace, renewable energy and energy distribution applications:

- > Si power devices: IGBTs (6.5kV), LDMOS, SOI Smart Power.
- > Wide Band Gap Semiconductors: SiC. GaN. Diamond.
- > Power Systems Integration.

Transducers for chemical and biochemical sensing

New chemical and biochemical transducers based on different transduction principles and/or signal propagation media, using new technologies, device structures, processes and materials:

- Electrochemical Transducers.
- Autonomous and wireless chemical sensor systems.
- Optomechanical components.
- Integrated opto-chemical transducers.
- Lab on a chip.

