Institute of Microelectronics of Barcelona IMB-CNM CSIC

The **IMB-CNM** is the largest institute in Spain dedicated to the research and development of Micro and Nano Technologies and Microsystems and with unique capabilities in silicon technology. It belongs to CSIC since its foundation in 1985 and is distinguished as a María de Maeztu Unit of Excellence.

IMB-CNM aims to contribute to the advancement of knowledge and to the economic and social development of society, as well as to the training of researchers and engineers and to the advice to public and private entities.

The 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 IMB-CNM is located on the Autonomous University of Barcelona (UAB) Campus and contains the largest clean room facilities in Spain with full capability to process its own CMOS technologies and laboratories.

Project Type: TFG/TFM

Project Title: Development of Flexible Triboelectric Generators for Mechanical Energy Harvesting

Research Group: MicroEnergy Sources and Sensor Integration Group (MESSI)

Project Description:

- This project aims to develop and optimize flexible triboelectric generators for harvesting mechanical energy from flexible structures and substrates.
- Students will investigate new triboelectric materials to enhance energy efficiency and device adaptability.
- Fabrication will include rapid prototyping techniques such as laser cutting, milling, and screen printing, complemented by micro- and nanofabrication to precisely control structural and functional properties.
- Finite element simulations will be performed to model the electromechanical behaviour, and electrical characterization will validate device performance.
- The ultimate goal is to produce efficient, flexible, and portable energy harvesting devices suitable for autonomous systems.

Work Plan:

- Fabrication of flexible triboelectric devices using rapid prototyping techniques (laser cutting, milling, and screen printing).
- Application of micro- and nanofabrication processes to optimize energy generation.
- Finite element simulation of the electromechanical behaviour of the devices.
- Electrical characterization to quantify generated power and validate functionality.

Candidate desired studies:

- ✓ MSc in Semiconductor Engineering and Microelectronic Design

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- ✓ MSc in Nanoscience and Nanotechnology
- ✓ MSc in Telecommunications Engineering
- ✓ BSc in Nanoscience and Nanotechnology
- ✓ BSc in Electronic Telecommunications Engineering

Application Process:

Before applying, please **check with your TFG/TFM program supervisor,** as he/she may already be coordinating with us to assign the project.

If there is no such coordination**, complete this form and send your CV and a motivation letter** to **Talent@imb-cnm.csic.es**, with the **subject: "TFG/TFM at IMB-CNM"**

Your CV will be forwarded to the Researcher leading the project who will contact you directly if interested.

Check our website for more information about the IMB-CNM and our research activities

https://www.imb-cnm.csic.es/en

Take the next step in your research career with us!

*By applying, you accept our data protection policy.

**IMB-CNM (CSIC) adheres to the European Charter and Code of Conduct for Researchers, ensuring full alignment with their principles and requirements, including equal opportunity, transparency, merit and ability, caring for an open, fair, and excellence-based hiring processes.

IMB-CNM holds the HR Excellence in Research award, which acknowledges CSIC's commitment to continuous improvement in HR strategies for researchers.

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