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: Design and Experimental Validation of a High-Flow Housing for a Microfabricated Airflow Sensor

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

Project Description:

- Understand the fabrication flow of air flow microfabricated sensor.
- Develop a housing specifically engineered to enable accurate measurements of high airflow rates for a microfabricated airflow sensor.
- Use modeling tools to optimize the housing geometry.
- Build a prototype of the designed housing using suitable materials and low cost techinques.
- Conduct laboratory tests to evaluate the housing's performance under varying high-flow conditions, comparing sensor readings with reference instruments.
- Analyze the experimental results to assess the accuracy, reliability, and repeatability of the sensor-housing system.
- Identify potential improvements in housing design based on testing outcomes to enhance sensor performance for future iterations.

Work Plan:

- Review research existing designs of airflow sensor housings, focusing on high-flow measurement challenges and solutions in microfabricated sensors.
- Create initial housing designs using CAD software.
- Perform simulations to evaluate airflow behavior through the housing and optimize its geometry for accuracy and stability.
- Manufacture the optimized housing prototype using appropriate materials and fabrication techniques, such as 3D printing or machining.
- Assemble the microfabricated airflow sensor within the housing.

Carrer dels Til·lers s.n., Campus UAB | 08193, Cerdanyola del Vallès
https://www.imb-cnm.csic.es | talent@imb-cnm.csic.es
+34 93 594 7700

Institute of Microelectronics of Barcelona IMB-CNM CSIC

- Conduct controlled airflow experiments across a range of high flow rates, recording sensor output and reference data for comparison.
- Analyze the collected data to assess sensor performance, accuracy, and repeatability with the designed housing.
- Document the design process, experimental methods, results, and conclusions in a final report.

Candidate desired studies:

- ✓ MSc Semiconductor Engineering and Microelectronic Design
- ✓ MSc Nanoscience and Nanotechnology
- ✓ MSc Telecomunications Engineering
- ✓ BSc Physics
- ✓ Doble Bsc in Physics and Chenistry
- ✓ Bsc Nanoscience and Nanotechnology
- ✓ BSc in Electronic Engineering for Telecommunications
- ✓ BSc in Industrial Electronics and Automation 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.

Carrer dels Til·lers s.n., Campus UAB | 08193, Cerdanyola del Vallès
https://www.imb-cnm.csic.es | talent@imb-cnm.csic.es
+34 93 594 7700