Institute of Microelectronics of Barcelona IMB-CNM CSIC

PhD Grant offer (PIF2025):

Microstructured silicon carbide detectors for medical applications

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.

Within IMB-CNM, the RDG research group is a multidisciplinary team combining expertise in electronics, microfabrication, and radiation detectors, supported by the institute's micro- and nanotechnology cleanroom facilities.

Project:

The main research activity is the development and validation in clinical centers of advanced silicon carbide (SiC) radiation detectors based on new micromachining technologies. These detectors will respond to the technological challenges of cutting-edge radiotherapy (RT) approaches such as proton therapy and FLASH RT that are changing the paradigm of treatments. You will be mainly involved in two developments in the IMB-CNM clean room:

(1) Ultra-thin SiC membrane diodes for beam monitoring — MEMS-based SiC diodes with etched backsides to measure proton beam position and intensity with minimal interference.

(2) SiC microdiodes for microdosimetry — MEMS-fabricated 3D SiC micro-volumes for precise dose measurement in high-radiation environments.

The overall goal is to pave the way to their clinical implementation in proton therapy. You will be trained in microfabrication processes in the IMB-CNM clean room, experimental tasks related to radiation detector characterization, and tests in clinical centers.

What will you do:

-Bibliographic review.

-Evaluation and optimization of SiC micromachining technologies at IMB-CNM's clean room

-Manufacturing of novel SiC-based micromachined diodes

-Experimental validation of SiC diodes in international pre-clinical and clinical centers

-Data analysis and comparison with state-of-the-art.

-Presentation of results in meetings and conferences.

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Who we are looking for:

We are looking for a motivated student with:

-Master in Semiconductor Engineering, Physics, or related field

-Good English speaking/writing.

-Previous experience in microfabrication processes is an asset.

What we offer:

- ✓ 4-year contract to do your doctoral thesis at IMB-CNM, in accordance with the provisions of Law 14/2011 on Science, Technology and Innovation
- ✓ In the framework of the PIF2025 call (former FPI grants)
- ✓ Remuneration (gross salary distributed in twelve monthly payments) 1st year: 1,623.26€;
- ✓ 2nd, 3rd and 4th year: 2,029.07€.

Minimum requirements:

- To be met at the time of the application: To have completed 300 ECTS credits
- To be met at the time of formalizing the contract:
    - Have admission to a doctoral program.
    - Have legal residence in Spain
- Personal skills: Motivation - Teamwork - Critical thinking and problem solving - Scientific writing and oral presentations - Research Ethics and Integrity - Collaborative knowledge generation

Language Requirements:

- English: Intermediate
- Spanish: Full working competence

Interested in joining us?

Complete this **form** and **send your CV*, Motivation Letter and Academic Transcripts**** to **Talent@imb-cnm.csic.es**, with the **subject: "(PIF2025): Microstructured silicon carbide detectors for medical applications"**
Incomplete or non-eligible applications will be automatically rejected.

*Applicants are kindly advised to ensure that their CVs clearly demonstrates compliance with the requirements of the position. CVs should include precise dates, relevant skills, and notable achievements that evidence the candidate's suitability and distinction in the selection process.

**Provisional academic transcripts can be obtained at
https://sede.educacion.gob.es/sede/login/inicio.jjsp?idConvocatoria=818

Deadline: 15/12/2025

Shortlisted candidates will be contacted to be informed of next steps.

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!

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- 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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