

Institute of Microelectronics of Barcelona IMB-CNM CSIC

Postdoctoral Position Microfabrication & Heterogeneous Integration for Microchannel Cooling Radiation Detectors Group

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.

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:

The project consists in the development of technological alternatives to incorporate microchannel cooling to currently available semiconductor technologies: Two approaches are considered: Monolithic integration, where the microchannels are embedded in the same silicon piece as the electronics; and heterogeneous integration by making use of functional interposers. These technologies should be valid both for ASICs and for radiation and imaging sensors depending on the application.

Different approaches are foreseen whether high density heat removal is required, or if the actual challenge is to cool large area sensors that require a uniform temperature distribution such as imaging sensors. In the case of high-density heat removal (especially for High-performance Computing) we will take advantage of the high thermal conductivity of Silicon and the very close contact of the microchannels to the electronics. For large area sensors, we will make use of full custom microchannel designs, to create asymmetrical heat removal across the silicon with higher microchannel density at the warmer areas.

For all these applications, we are developing methods to integrate the microchannel cooling into external technologies and systems. We are involved in collaborations with end-users from different application areas where we develop prototypes and demonstrators for their applications, and we also work together with the collaborators in the full-system solutions and optimal specifications for their final implementation.

Our objectives are to develop microchannel cooling solutions integrated in microelectronic platforms, including:

- Silicon interposers with embedded microchannels
- Integration with Redistribution Layers (RDL)
- Co-integration with Through-Silicon Vias (TSVs)
- Monolithic integration with radiation detectors

Institute of Microelectronics of Barcelona IMB-CNM CSIC

Applications include:

- Particle physics instrumentation (future collider experiments)
- Photon science (e.g., Free Electron Lasers)
- Emerging applications in High-performance Computing (HPC) cooling and heterogeneous integration

Researcher Profile:

We are seeking a highly motivated Postdoctoral Researcher to lead the technical development and integration of advanced microchannel cooling technologies for next-generation radiation and imaging detectors and HPC systems.

The main contributions will be on microfabrication, heterogeneous integration, and system-level technology development, with strong interaction with clean room engineers and with international collaborators.

The successful candidate will play a key technical leadership role, coordinating the development of multiple prototypes from design to fabrication and validation.

Key responsibilities:

The selected candidate will act as Technical Lead for prototype development, with the following responsibilities:

- ❖ Technical Leadership:
 - Lead the integration and development of microfabricated prototypes
 - Define and optimize process flows for microchannel cooling devices
 - Ensure compatibility between the different processes involved
- ❖ Prototype Coordination:
 - Coordinate multiple concurrent prototype developments
 - Plan fabrication runs and process iterations
 - Identify and mitigate technical risks
- ❖ Collaboration & Interface:
 - Act as the technical interface with international partners
 - Translate system-level requirements into design and process specifications
 - Support experimental campaigns and interpretation of results
- ❖ Knowledge Management:
 - Maintain structured know-how of process flows, design decisions, and experimental results
 - Contribute to internal technical reports, project reports, and publications

We expect the candidate to have sufficient autonomy and leadership to handle the planning and supervision of clean room processes, and take technical decisions on his own. We expect him/her to report in periodical meetings with the research team and in meetings with international collaborators.

The candidate will work within a structured research team:

- The Principal Investigator (PI) leading strategy and external collaborations
- A Scientific Lead (Senior Postdoc) focusing on scientific direction and publication
- Several Cleanroom Engineers responsible for fabrication and process execution

We work in a highly collaborative environment, and we expect the candidate to be able to collaborate openly and fruitfully both internally with the team, with the technical staff of the institute clean room, and with external international collaborators.

Institute of Microelectronics of Barcelona IMB-CNM CSIC

Education and Experience

- ✓ PhD in Experimental Physics, Microelectronic Processing, Electronic Engineering, Materials Science.
- ✓ Leading skills to take technical decisions and responsibilities.
- ✓ Capacity to collaborate efficiently and openly in a technical and research environment.
- ✓ Proven experience in cleanroom-based microfabrication.
- ✓ Experience in MEMS or in advanced packaging / heterogeneous integration.
- ✓ Candidates with some previous experience in applied microfluidics or thermal management will be appreciated.
- ✓ Full working competence in English and basic knowledge of Spanish.
- ✓ Skills: Teamwork, Critical thinking and problem solving, Collaborative knowledge generation, Managing deadlines and competing responsibilities, Flexibility in scientific approaches and collaboration.

What We Offer

- ❖ The opportunity to join one of Spain's leading research centres in micro- and nanotechnologies, internationally recognised for the excellence of its scientific and technological activities.
- ❖ Access to cutting-edge nanofabrication facilities and research resources.
- ❖ Collaboration with leading researchers in the microtechnology field.
- ❖ Publishing in high-impact scientific journals and presenting in international conferences.
- ❖ A dynamic, collaborative and multidisciplinary environment with highly qualified researchers, engineers and technical specialists.
- ❖ Expected start date: December 2026-January 2027

Interested in joining us?

Complete this [form](#) and send your CV, Motivation Letter, Academic Records and 2 Academic References to Talent@imb-cnm.csic.es, with the subject: "**Postdoc - Microfabrication & Heterogeneous Integration**".

Incomplete or non-eligible applications will be automatically rejected.

*Applicants are kindly advised to ensure that their CVs clearly demonstrate 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.

Deadline: October 30th, 2026

Shortlisted candidates will be contacted by the second week of October, 2026 to be informed of next steps.

Check our [website](#) for more information about the IMB-CNM and our research activities

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.