

Job title

Nanomechanical characterization of sensor devices based on novel materials (JAE-INTRO Programme)

Main tasks and responsibilities

The proposed project will be conducted within the framework of the "SENDESIS" project, "Sensor devices by sequential infiltration synthesis of metal oxides on block copolymer templates." The overarching aim of the SENDESIS project is to pioneer a novel class of advanced functional nanomaterials through the infiltration of thin films of nanostructured polymers with metal oxides. Infiltrated polymers, especially when combined with metal oxides through techniques like sequential infiltration synthesis (SIS), exhibit several unique properties that make them valuable for various applications. Some of these properties include enhanced mechanical strength, improved thermal stability and chemical resistance offering a versatile platform for tailoring the properties of composite materials to meet diverse application requirements across fields such as materials science, electronics, catalysis or sensor devices.

The student will primarily undertake the mechanical characterization of the nanostructured polymers fabricated at the clean room of IMB-CNM. This will be carried out by combination of dedicated mechanical test platforms and atomic force microscopy (AFM), with a focus on advanced modes such as Quantitative Nano Mechanics (QNM) based on peak force tapping. Supplementary characterization of the nanostructures will be conducted using scanning electron microscopy (SEM), focused ion beam scanning transmission electron microscopy (FIB-STEM), or energy-dispersive X-ray spectroscopy (EDX). The student's work will contribute to understanding the functional properties hybrid organic-inorganic nanomaterials in the form of nanostructured thin films, nanowires, or 3D stacked films for building up sensors of unprecedented performance. Additionally, the student will have the opportunity to collaborate closely with the clean room engineers for material optimization and device integration.

Requirements/Background and skills

Master students (course 2023/24 or 2024/25) or undergraduate students in their final year
This position has a JAE INTRO fellowship associated. For more information about the specific requirements/ conditions on the website <https://sede.csic.gob.es/intro2024>

Description of Group

Nanofabrication and nanomechanical Systems Group ([NANONEMS](#))

Summary of conditions

- Salary: 4200€ (7 months 600€/month)
- Possibilities to enroll in a PhD thesis

How to apply

All applications must be sent to marta.fernandez@imb-cnm.csic.es, with the subject JAE-INTRO. Applications must include a CV

Deadline for applications 14/05/2024

- This offer can be found on: <https://www.imb-cnm.csic.es/en/about-center/careers/open-positions>
- More information on IMB-CNM: <https://www.imb-cnm.csic.es/en/>