

The mission of the Catalan Institute of Nanoscience and Nanotechnology (ICN2) is to achieve the highest level of scientific and technological excellence in Nanoscience and Nanotechnology. Its research lines focus on the newly-discovered physical and chemical properties that arise from the behaviour of matter at the nanoscale. ICN2 has been awarded with the Severo Ochoa Center of Excellence distinction for three consecutive periods (2014-2018 and 2018-2022 and 2023-2026). ICN2 comprises 20 Research Groups, 7 Technical Development and Support Units and Facilities, and 2 Research Platforms, covering different areas of nanoscience and nanotechnology.

Job Title: PhD student in atomic scale characterization of semiconductor materials

Research area or group: Advanced Electron Nanoscopy (GAeN)

Description of Group/Project:

The Group of Advanced Electron Nanoscopy (GAeN) has focus on exploring the limits of physical resolution for understanding the ultimate behavior of materials at the nanoscale based on their intrinsic atomic distribution. Within this purpose, Transmission Electron Microscopy (TEM) is a technique that allows for atomic scale imaging combined with spectroscopic methods such as energy dispersive X-ray spectroscopy (EDX) and electron energy loss spectroscopy (EELS), which provide spatially resolved information about composition, valence state, plasmonics and phononics. These techniques permit the correlation of physicochemical properties with atomic structure and composition, leading to a full understanding of nanoscale systems.

In this context, the student will focus on the atomic scale characterization of 1D semiconductor materials (nanowires), aiming to unveil the growth mechanisms of such nanomaterials and unravel the role of atomic arrangement in their properties, such as defect formation and elemental segregation.

Main Tasks and responsibilities:

The successful candidate will work in collaboration with international research groups from the École Polytechnique Fédérale de Lausanne or the Niels Bohr Institute of the University of Copenhagen, among others. The experimental measurements will be conducted at the Joint Electron Microscopy Center at ALBA Synchrotron (JEMCA) using brand new TEM facilities to analyse materials at sub-nanometre scales. Therefore, the student will work with state-of-the-art Electron Microscopy Techniques such as Differential Phase Contrast, 4D STEM or monochromated EELS to access the materials structure, composition and local properties at the atomic scale. The candidate will have the chance to pursue an internship at a foreign research institution to deepen their knowledge in specific topics and will also write scientific publications for publication in peer-reviewed high impact journals and disseminate their work in international conferences.

Requirements:

- **Education:**
Master's degree in physics, nanotechnology, chemistry, materials science or related areas
- **Knowledge and experience:**
Background in physics, nanotechnology, chemistry, materials science or related areas
Experience in electron microscopy or other characterization techniques will be valued.
- **Personal Competences:**
Creative, curious and innovative.

Summary of conditions:

- Full time work (37,5h/week)
- Contract Length: Temporary
- Location: Bellaterra (Barcelona)
- Salary will depend on qualifications and demonstrated experience.
- Support to the relocation issues.
- Life Insurance.

Estimated Incorporation date: 01/10/2023

How to apply:

All applications must be made via the ICN2 website <https://jobs.icn2.cat/job-openings/546/phd-student-in-atomic-scale-characterization-of-semiconductor-materials> and include the following:

1. A cover letter.
2. A full CV including contact details.
3. 2 Reference letters or referee contacts.

Deadline for applications: 20 September 2023

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Plan de Recuperación, Transformación y Resiliencia – Financiado por la Unión Europea – NextGenerationEU.*

Este contrato está financiado por el Mecanismo de Recuperación y Resiliencia de la Unión europea, establecido por el Reglamento (UE) 2020/2094 del Consejo, de 14 de diciembre de 2020, por el que se establece un Instrumento de Recuperación de la Unión Europea para apoyar la recuperación tras la crisis de la COVID-19, y regulado según Reglamento (UE) 2021/241 del Parlamento Europeo y del Consejo de 12 de febrero de 2021 por el que se establece el Mecanismo de Recuperación y Resiliencia, y quedará sometido a la totalidad de la normativa reguladora del Mecanismo de Recuperación y Resiliencia.

Se enmarca en la implementación de los Planes Complementarios de I+D+I con las comunidades autónomas, que forman parte del componente 17 del Plan de Recuperación, Transformación y Resiliencia, denominado “Reforma institucional y fortalecimiento de las capacidades del Sistema Nacional de Ciencia, Tecnología e Innovación”, en concreto en el SUBPROYECTO DE I+D “INSTALACIÓN CORRELATIVA IN-SITU PARA MATERIALES AVANZADOS PARA ENERGÍA (In-CAEM)” DEL PLAN COMPLEMENTARIO EN EL ÁREA DE MATERIALES AVANZADOS como parte de actuaciones del programa de Materiales Avanzados “Materials amb funcionalitats avançades per a la nova transformació tecnològica”, correspondientes a la comunidad autónoma de Cataluña, gestionado a través del Departament de Recerca i Universitats de la Generalitat de Catalunya

Equal opportunities:

ICN2 is an equal opportunity employer committed to diversity and inclusion of people with disabilities.

ICN2 is following the procedure for contract of people with disabilities according with article 59 of the Royal Decree 1/2015, of 30 of October.