

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 behavior of matter at the nanoscale. ICN2 has been awarded with the Severo Ochoa Center of Excellence distinction for two consecutive periods (2014-2018 and 2018-2022). ICN2 comprises 18 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

Research area or group: Theoretical and Computational Nanoscience Group

Description of Group/Project:

Main research lines:

Leading-edge theoretical research on quantum transport phenomena in graphene and 2D materials.

Spin dynamics and entanglement properties in Dirac matter (graphene, topological insulators).

Thermal transport properties and thermoelectricity.

Predictive modelling and multiscale numerical simulation of complex nanomaterials and quantum nanodevices.

Main Tasks and responsibilities:

A PhD. Position with grant from the Spanish Ministry is available at the “*Theoretical and Computational nanoscience group*” led by ICREA Prof. Stephan Roche, at the Catalan Institute of Nanoscience and Nanotechnology (ICN2, Campus UAB, Bellaterra, Spain)

This project will be conducted within the National Project ECONWHET funded by the Ministry.

The student’s research will focus on the numerical simulation of time-dependent interactions in graphene and other low-dimensional materials. Using state-of-the-art quantum transport simulation codes developed within the group, the student will investigate the impact of dephasing processes in various nanoscale devices. With an in-house simulation package, the student will also explore energy conversion processes arising from time-dependent interactions. In addition to revealing fundamental physical phenomena, these studies will have broad impact in the fields of low-power electronics, communications, and sensing technologies.

Requirements:

- **Education**

BSc or MSc in Physics or related field

- **Knowledge and professional experience**

Knowledge of quantum mechanics, solid state physics, quantum transport

Knowledge of the physics of graphene and other low-dimensional materials

Experience with numerical simulation

Summary of conditions:

- Full time work (37,5h/week)
- Contract Length: 3 years
- Support to the relocation issues.
- Life Insurance.

How to apply:

All applications must be made via the ICN2 website <https://jobs.icn2.cat/job-openings/261/phd-student-theoretical-and-computational-nanoscience-group> and include the following:

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

Equal opportunities:

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