As a flagship research center in nanoscience and nanotechnology, our mission is to open and explore new frontiers of knowledge at the nanoscale, and bring value to society in the form of new understanding, capabilities and innovation, while inspiring and providing broad training to the next generations of researchers.

Our 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 19 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 - Thermal Properties of Nanoscale Materials

Research area or group: Thermal Properties of Nanoscale Materials
Supervisors: Javier Rodríguez-Viejo, Cristian Rodríguez-Tinoco, Gustau Catalan

Description of Group/Project:
Oxide (anti)ferroelectrics possess multiple functionalities suitable for energy conversion and storage. The objective of this project is to utilize oxide ferroelectric membranes to explore their potential in electrocaloric cooling and pyroelectric energy conversion, thereby transforming low-grade heat into usable energy. This endeavor will be undertaken through a synergistic collaboration between the GTNaM and ON groups at ICN2, leveraging their complementary expertise in phase transitions and membrane-based devices (GTNaM) along with the ON group's proficiency in the fundamental physics of ferroelectric materials and their applications. In addition to growing high-quality epitaxial layers at the Nanomaterials Growth Unit, the candidate will be involved in designing and fabricating membrane-based resistive devices to conduct heat capacity, electrocaloric, and pyroelectric measurements on ultrathin FE/AFE materials during rapid cycling under fast temperature or electric field switching, or both.

Main Tasks and responsibilities:

1. Growth of high-quality epitaxial oxide films.
2. Design and microfabrication of membrane-based calorimetric devices.
3. Heat capacity evaluation in nm thick oxide membranes.
4. Measurement of electrocaloric effects and pyroelectricity in ferro- and antiferroelectric oxide membranes.

Requirements:

- **Education:** Bachelor in Physics/Engineering. Master in Condensed Matter Physics or master in materials science.
- **Knowledge:** Condensed matter physics, thin film growth, oxides, phase transitions.
- **Professional Experience:** Not needed, but previous lab work is a plus.
- **Personal Competences:** Team work, creativity

Summary of conditions:

- Full time work (37,5h/week)
- Contract Length: 48 months
- Location: Bellaterra (Barcelona)
- Salary will depend on qualifications and demonstrated experience.
- Support to the relocation issues.
- Life Insurance.
- Flexible compensation plan

Estimated Incorporation date: September 1st 2024

How to apply:
All applications must be made via the ICN2 website 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: N/A

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.