ICN2 is a renowned research centre. Its research lines focus on the newly discovered physical and chemical properties that arise from the behaviour of matter at the nanoscale.

The Institute promotes collaboration among scientists from diverse backgrounds (physics, chemistry, biology, and engineering) to develop basic and applied research, while seeking out new ways to interact with local and global industry.

It also offers researchers training in nanotechnology, develops numerous activities to promote and enable the uptake of nanotechnology by industry, and promotes networking among scientists, engineers, technicians, business people, society, and policy makers.

ICN2 was accredited in 2014 as a Severo Ochoa Centre of Excellence and is a founding member of the Barcelona Institute of Science and Technology (BIST). The aim of the Severo Ochoa Program, sponsored by the Spanish Ministry of Economy, Industry and Competitiveness, are to identify and support those Spanish research centres that demonstrate scientific leadership and impact at global level.

Job Title: PhD Student in Advanced Surface Electromechanics

Research area or group: Oxide Nanoelectronics Group

Description of Group/Project:
The research lead by Dra. Neus Domingo at the Advanced AFM Laboratory of the Institut Català de Nanociencia i Nanotecnologia (ICN2) in Barcelona has become a reference in Europe for the nanoscale characterization of piezoelectric and ferroelectric materials. Research lines mainly concern the surface electric and electromechanical properties at the nanoscale; current topics of interest include but are not limited to adsorbates on ferroelectric surfaces, surface electromechanical characterization, domain wall nanoelectronics, oxide interface effects or nano-confined phase transitions.

Main Tasks and responsibilities:
The phD student will fully develop the work in the frame of the ADVanced Surface Electromechanics project from the Spanish Government, devoted to quantify the different phenomena that contribute to nanoscale electromechanical response as measured by an Atomic Force Microscope (AFM) instrument, including polarization-dependent mechanical properties of ferroelectric domains and domain walls, electro-ionic migration and electrochemistry, electromechanical coupling by adsorbates or skin layers, and flexoelectricity.

The phD student will be trained in the state of the art of Piezoresponse Force Microscopy (PFM), and will pursue the development of Advanced PFM modes, to evolve this technique from its current status as the main tool for qualitative analysis of ferroelectrics into a reliable instrument for accurate quantitative measurement of electromechanical properties in ceramics, thin films, and MEMS. The main tool will be a cryogenic Atomic Force Microscope (Attocube) that works at temperatures down to 5K with in-situ magnetic fields of up to 9T, and an environmental AFM platform (Asylum) with high versatility of operation modes and environments. Special emphasis will be placed on the study of adsorbates and their role as surface polarization screening charges on ferroelectric materials, and their interplay with the detection of surface electromechanical properties.

The phD student will also use complementary techniques for the study of surfaces and dielectric, piezoelectric, flexoelectric and ferroelectric properties, from general electric characterization equipment available in our laboratories to in-home and synchrotron XPS techniques.

Education, Experience, Knowledge and Competences required:
We seek strongly motivated young researchers willing to achieve a phD with high level of excellence. PhD students of our research group are prepared to lead their own research lines from the experimental base to the final publication of the results.

Related to the offered position, the applicant should ideally have a background on physics, electronic engineering or materials science, oriented to nanoscience and nanotechnology areas.

The main requirement is the willingness and skill to get involved in the setting up of the experimental facilities: the researcher will have the chance to use cryogenic systems and all types of instrumentation for electrical characterization. Our group focuses on original research, so we place a strong premium on fresh thinking; the ideal applicant should therefore be an independent thinker, enthusiastic about learning and doing good research, as well as a friendly communicator in English, both in writing and in oral presentations. For the experimental work, it is also essential a well-organized and methodological candidate. Good inter-personal skills are essential since the group is committed with excellent team spirit environment.

Research Career Profile (According to the European Framework for Research Careers):

First Stage Researchers (R1)

Summary of conditions:

- Full time work (37,5h/week)
- Contract Length: 3 years.
- Salary will depend on qualifications and demonstrated experience.
- Salary according to the cost of living in Barcelona.
- Support to the relocation issues.
- Life Insurance.

Estimated Incorporation date: 15, September, 2017

How to apply:
All applications must be made via http://jobs.icn2.cat/job-openings/117/phd-student-in-advanced-surface-electromechanics 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: July, 15.

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