

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 19 Research Groups, 7 Technical Development and Support Units and Facilities, and 2 Research Platforms, covering different areas of nanoscience and nanotechnology.

Job Title: Postdoctoral Researcher

Description of Group/Project:

As a member of a research team formed by the groups of Profs. Joaquin Fernández-Rossier, Zhongchang Wang, Leonard Francis (International Iberian Nanotechnology Laboratory, Braga, Portugal), Dr. Efrén Navarro (Instituto de Ciencia Molecular y Universidad de Valencia, Valencia, Spain), Dr. Sergio O. Valenzuela (Catalan Institute of Nanoscience and Nanotechnology, Spain, and the Electronic and Magnetic Structure of Matter Section of ALBA, you will focus your scientific work on developing novel 2D layers and “Moiré” structures of magnetic Quantum Materials of Van-der-Waals type not realized or explored to date. You will be stationed in, and contracted by ALBA, but the collaboration will also require short term stays at the different laboratories of the collaboration partners.

Main Tasks and responsibilities:

As the successful candidate, you will work with the 2DMoreMagQMs project consortium team towards developing novel 2D layers and “Moiré” structures of magnetic Quantum Materials of Van-der-Waals type, not realized or explored to date, in order to produce and investigate emergent electronic and magnetic states arising by the rupture of crystal symmetry and the frustration of electronic and magnetic orders characteristic of bulk forms. At the level of fabrication, top-down (cleaving, exfoliation) and bottom-up (evaporation, epitaxy) approaches will be used together with deterministic transfer in inert atmosphere (glove boxes) and/or clean room environments. The structural, electronic and magnetic properties of the systems will be investigated by complementary synchrotron radiation (ALBA), high-resolution transmission electron microscopy (INL and BIST) and laboratory techniques (ICN2, Univ. Valencia). More specifically, magnetic properties will be characterized using magneto-optical Kerr effect (MOKE) and x-ray magnetic circular dichroism (XMCD beamline at ALBA), with spatially resolved information provided via x-ray microscopy (PEEM endstation at ALBA); transport properties will be investigated by sheet resistance and Hall-type of measurements; electronic structure will be revealed via angle-resolved photo-emission spectroscopy (ARPES beamline at ALBA), while structural properties will be characterized by high resolution electron microscopy (SAED, Lorentz, EELS), x-ray diffraction and Raman-Photo-luminescence spectroscopy. The most relevant systems and results will be supported by theory calculations (INL).

You will develop your own scientific program aligned with the collaboration, groups, sections, and facilities goals and at the same time support users mostly, but not exclusively, aligned with your own scientific interests. In a diverse, highly interactive team, you will have excellent conditions to refine your scientific expertise, the technical and computational background, and most importantly build a broad and carrying network for your future scientific career. You will build national and international recognition by using opportunities to publish and present your scientific results and approaches at conferences, workshops and seminars.

Specifically, you will

- Develop your own scientific program which will be strongly aligned with the scientific program of the collaboration team, the beamlines you will use, and in the larger context of the section and facility. In details this includes, developing the research plan, executing this plan with your research partners, contributing to the preparation of experimental proposals applying for general user beamtime at ALBA and/or other facilities, and contributing to the analysis and publication of the results.
- Provide support to users from the field of 2D magnetic materials as Local Contact.
- Participate on the maintenance, commissioning and upgrade activities of equipment used for this project.
- Engage in the on-going beamline research program, national, Portuguese and European projects and collaborations. This may also include the initiation of new projects if appropriate.
- Participate in the development of the ALBA II project, the upgrade project of ALBA to a 4th generation synchrotron.

Requirements:

- The applicant must have a doctorate in Chemistry, Physics or related disciplines.
- The applicant must be Portuguese or have a permanent residence in Portugal.
- Ability to propose, conduct, and contribute an independent research program using the instrumentation and expertise at the collaboration partners and ALBA.
- A good level of English both written and spoken is a must. The working language at ALBA is English.
- Good interpersonal skills and capabilities to work in a group, adaptability to a multidisciplinary environment, sense of responsibility and capabilities to work in a group as well as to work independently.
- Ability to work within a multidisciplinary team.

Summary of conditions:

FUNDING: the selected applicants will be jointly funded by FCT (national funds through the FCT budget) and the CELLS, following the terms of Point IV (Financial Obligations) of the Post-Doctoral Agreement.

CONTRACT TYPE: Temporal (2+3 years)

How to apply:

All applications must be made via the ALBA website: <https://public.cells.es/jobs/#!/jobs/postdoctoral-researcher-position>

Equal opportunities:

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