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 values are Commitment, Collaboration and Transformation.

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: Postdoctoral researcher - Green SELf-Powered NEuromorphic Processing EnGines with Integrated VisuAl and FuNCtional Sensing (ELEGANCE)

Research area or group: Nanostructured Materials for Photovoltaic Energy Group

Description of Group/Project: The NMPE group research objectives are focused on the synthesis of novel nanomaterials and the control of their optoelectronic properties through their manipulation at molecular level, with the aim of developing highly stable and highly efficient perovskite solar cells. Specifically, our contribution is in the area of solution processable metal oxides (classical and complex), halide perovskites (Pb-free, 2D and 3D) and, more recently, 2D materials and MXenes. We aim at the development of highly stable solar cells for industrial applications (e.g. building integration PV) and novel self-powered photovoltaic-based devices for Internet of things (IoT) applications (e.g. sensors, wearables, printed electronics). The group, with more than 15 year of experience in the field, is internationally recognized for its involvement in the enhancement of the operational stability of emerging photovoltaics and the development of ISOS protocols.

Main Tasks and responsibilities:

General Objective: Synthesis, Fabrication and Characterization of Pb-Free Halide Perovskites Photovoltaics and Memristors

Specific Objectives:
1) To synthesize Pb-free halide perovskites.
2) To synthesize, delaminate and functionalize MXenes
3) To develop novel sustainable ink formulations based on Pb-free halide perovskites, semiconductor oxides and 2D materials.
4) Fabrication and characterization of complete perovskite solar cells and memristors.
5) Development of a methodology for the characterization of chromo-memristors.

Tasks:
• Synthesis and functionalization of materials, especially Pb-free Metal Halide perovskites (MHPs), including all inorganic and 2D materials, and oxides.
• Fabrication of functionalized Pb-free MHPs by solution processing methods.
• Fabrication of complete Pb-free MHPs solar cells and memristors (TFTs).

• Stability analysis of materials and devices following the recently upgraded ISOS protocols and in-situ characterization.
• Development of stability protocols for memristor characterizaiton.
• Process and analysis of data.
• Elaboration of periodic reports to keep track of the project progress.
• Preparation of scientific manuscripts and presentations in workshops or conferences to showcase your research results to the scientific community.
• Skills on proposal writing

Requirements:

- **Education:** PhD degree in electronic engineering, physics, chemistry, materials science, nanotechnology, or closely related discipline.
- **Professional Experience:** Good publication record. Experience in thin film or/and solar cell fabrication by solution processing methods.
- **Personal Competences:** Highly motivated and enthusiastic researcher.
  Strong analytical skills and a keen interest in the interpretation of complex data.
  Excellent organization skills, time management and ability to work to priorities.
  Excellent written and oral communication skills. High English level is mandatory (written and spoken)

Summary of conditions:

- Full time work (37,5h/week)
- Contract Length: 1 year

- Location: Bellaterra (Barcelona)
- Salary will depend on qualifications and demonstrated experience.
- Support to the relocation issues.
- Life Insurance.
- Work-Life Balance and Flexibility with flexible work schedules
- 28 holidays per year
- Flexible compensation plan: tax advantages contracting some products (health insurance, childcare, training, among others.)
- Training activities: languages, mentoring programme, wellbeing programme.
- International environment

Estimated Incorporation date: March 2025

Funded by the European Union

This contract has received funding from the European Union's Horizon Europe research and innovation programme under ELEGANCE project.

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: 28/02/2025. Applications will be continuously reviewed.

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.