NEW POSITION FORM
(Combined Advert and Internal Request Form)

ICN2 Institut Català de Nanociència i Nanotecnologia

HR EXCELLENCE IN RESEARCH

NOTE: INFORMATION PROVIDED ON THIS PAGE WILL BE USED EXTERNALLY

JOB DESCRIPTION
(To be completed by Hiring Manager)

Date	01/09/2025
Job title	Postodoctoral Researcher Position in (Scanning) Transmission Electron Microscopy of Catalytic Materials for Green Hydrogen and Energy Applications
Area or Group of research	Advanced Electron Nanoscopy (GAeN) Group
Directly reporting to	Alba Garzón Manjón and Jordi Arbiol
Description of Group/Project	We are looking for a skilled Postdoctoral Researcher to support advanced characterization efforts within the framework of the NEXPECH project, a European initiative M-era.Net funded by AEI (Agencia estatal de Investigación) from the Ministerio de Cienecia, Innovación y Universidades involving international partners from three countries. This project aims to tackle the global challenge of reducing greenhouse gas emissions by developing innovative, sustainable energy solutions, specifically through the generation of green hydrogen via solar-driven photoelectrochemical (PEC) systems. In this postdoctoral position, you will apply advanced electron microscopy techniques, including STEM and FIB, to investigate the structure and behavior of catalytic nanomaterials critical for green hydrogen and energy technologies. The candidate will design and perform real-time in-situ TEM experiments using gas and liquid sample environments, enabling the observation of materials under conditions that mimic actual operating environments. Working closely with partners in the NEXPECH project, you will analyze their materials and provide valuable insights to help optimize device performance. Additionally, you will support collaborators by assisting with in-situ TEM measurements, facilitating cutting-edge research in sustainability and energy fields.

MAIN TASKS AND RESPONSIBILITIES
(To be completed by Hiring Manager)

- Operate and optimize advanced STEM and FIB instrumentation for the nanoscale analysis of catalytic and energy-related nanomaterials, supporting the development of high-performance materials for green hydrogen production and energy storage.
- Perform detailed STEM analyses on project-related materials provided by NEXPECH partners, contributing directly to the evaluation and development of novel PEC systems.
- Design and implement in-situ TEM experiments using the available gas and liquid sample holders to study dynamic processes in real-time, under controlled environmental conditions relevant to catalysis and PEC operation.
- Work closely with national and international collaborators by offering hands-on support and guidance for in-situ TEM experiments.
- Train students and other researchers on in-situ (S)TEM

EDUCATION, EXPERIENCE AND SKILLS REQUIRED
(To be completed by Hiring Manager)

- Education: PhD in Chemistry, Physics or Material Science, or closely related fields, with a strong focus on nanomaterials and advanced characterization techniques.
- Knowledge: Deep expertise in electron microscopy, particularly STEM and FIB methods. Proven experience in designing and conducting in-situ TEM experiments. Familiarity with energy-related nanomaterials and catalysis is highly desirable.
- Professional Experience: Previous research experience in an academic or industrial setting involving advanced transmission electron microscopy for energy materials or catalysis, skills on in-situ TEM will be a plus. Experience collaborating in international, multidisciplinary projects is a plus. Hands-on experience working with large-scale research infrastructures, such as synchrotrons, is an advantage.
- Personal Competences: Strong problem-solving skills and the ability to work independently as well as part of a collaborative international team. Excellent communication skills to support project partners effectively and contribute to scientific discussions and reporting. Adaptability, attention to detail, and a proactive attitude toward research challenges are essential for success in this possition.

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JOB PURPOSE
(To be completed by Hiring Manager)

Mission of this position	Drive green hydrogen innovation through advanced electron microscopy and collaborative energy research.
Added value of this position to ICN2	Provide critical nanoscale insights that accelerate material and device development

CONTRACT DETAILS
(To be completed by Hiring Manager in conjunction with HR)

Expected date of start		01/11/2026
Funds/ Budget allocation	CECO Number	00680400
Funds/Budget allocation	CECO Name	2023 NEXPECH2 JA
Budget controller´s name		Noèlia Arias
Reason of this job request		
Types of the contract		

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Terms and duration of the contracts		
Position		
Position Salary Range	#N/A	#N/A
Offered Salary Range		
Social Security range	0	0
Total	0	0
Variable salary		

ADDITIONAL COMMENTS TO CONTRACT DETAILS
(To be completed by Hiring Manager)

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MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

OTHER INFORMATION
(To be completed by Hiring Manager)

Equipments, tools and procedures needed to carry out the duties and responsibilities	FEI TECNAI F20 placed at ICN2 and Thermofisher Spectra 300 and Spectra ULTRA installed at JEMCA (ALBA Synchrotron). The Spectra 300 and Spectra ULTRA are monochromated and double corrected microscopes. The Spectra 300 is equipped with ah HR EELS Gatan Continuum with K3 direct detector and EDX, pixelated and segmented STEM detectors, 4D-STEM, fast CMOS camera. The Spectra ULTRA is equipped with an ILIAD EELS spectrometer with Zebra detector and the ULTRA-X EDX detector, pixelated and segmented STEM detectors, 4D-STEM and fast CMOS camera. The ICN2 sample preparation lab is equipped with a fully automated FIB HELIOS 5UX, and 3 SEMs (1 environmental SEM and 1 HR SEM FEI Magellan). JEMCA also have liquid, gas, heating and bias sample holders for in-situ analysis.

APPROVAL

Job requestor signature	Budget controller signature
JORDI ARBIOL COBOS - DNI 46661573R Digitally signed by JORDI ARBIOL COBOS - DNI 46661573R Date: 2025.09.01 15:10:32 +02'00'	