

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 - Electrochemical synthesis or renewable fuels and chemicals

Research area or group: NanoElectrocatalysis and Sustainable Chemistry

Description of Group/Project:

The NanoElectrocatalysis Group combines electrochemistry, materials engineering and in situ characterisation to elucidate design principles for the discovery of novel materials for renewable energy conversion and storage, as well as the production of sustainable fuels and chemicals. We offer stimulating working conditions in a vibrant, interdisciplinary, and international research environment. This position is linked to the ELECTROFUEL PID2023 project titled "Active Site Engineering of Functional Electrocatalysts for Renewable Energy Conversion into Green Fuels" funded by AEI / MCIN, led by Prof. María Escudero Escribano. Within this project, the candidate will develop and characterise well-defined electrocatalyst materials and investigate the molecular mechanisms of emerging electrocatalytic reactions for the sustainable electrosynthesis of renewable fuels and value-added chemicals and building-blocks such as fertilisers and amino acids.

Main Tasks and responsibilities:

The successful candidate will combine classical electrochemical methods with in situ characterisation techniques including spectroscopy, electrochemical scanning probe microscopy and electrochemical mass spectrometry to investigate the structure-property relations of electrocatalyst materials as well as the mechanism of novel electrocatalytic reactions. The reactions of interest include the electrochemical reduction of carbon dioxide and carbon monoxide and nitrate reduction into renewable fuels along with the electrochemical C-N coupling to produce value-added chemicals (e.g. sustainable fertilisers and pharmaceuticals). The candidate will develop electrochemical and in situ characterisation methods and setups for the real-time detection of intermediates and products during electrocatalytic reactions.

This PhD will be part of the "Electrochemistry. Science and Technology" interuniversity PhD programme and will be carried out in collaboration with other groups at both ICN2 and foreign research institutions. The candidate will carry out independent research under supervision, write scientific papers for publication in peer-reviewed journals, and disseminate their work in international conferences.

Requirements:

We are looking for a creative, curious and innovative candidate with an academic level equivalent to a master's degree within the field(s) of chemistry, chemical engineering, nanoscience and nanotechnology, materials science, physics or related areas. The candidate should have strong knowledge and experience in electrochemistry, electroanalytical techniques, materials characterisation and/or in situ microscopy or spectroscopy for the characterisation of electrochemical reactions. Relevant publications within electrochemistry are a plus. The candidate should have teamwork and problem solving skills. Excellent written and spoken communication skills in English are required. The successful candidate will be able to develop experimental methods, advance the PhD project and work independently and as part of a team.

Summary of conditions:

- Full time work (37,5h/week)
- Contract Length: Predoctoral Contract (4 years)
- Location: Bellaterra (Barcelona)
- Salary will depend on qualifications and demonstrated experience.
- Support to the relocation issues.
- Life Insurance.

Estimated Incorporation date: January 2025

How to apply:

All applications must be made via the ICN2 website <https://jobs.icn2.cat/job-openings/660/phd-student-electrochemical-c-n-coupling-for-sustainable-synthesis> 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: October 25th. 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.

