



Postdoctoral Research Position in Scanning Tunneling Microscopy

Are you passionate about exploring electrocatalytic reactions for clean and sustainable energy production? Do you want to contribute to the development of advanced techniques to understand the atomic-scale properties of catalytic surfaces? If so, join the team for unveiling the fundamental chemical and physical characteristics of catalysts' surfaces that determine their macroscopic catalytic performance.

The PECAS Lab, located within the Faculty of Chemistry at the UPV/EHU campus in San Sebastián, Basque Country, Spain, is looking to appoint a motivated and talented postdoctoral researcher. This position will focus on conducting experimental research in surface electrochemistry, specifically within the framework of the ERC Starting Grant project "**Controlling Oxygen Selectivity at the Atomic Scale**" (ERC-2021-StG, COSAS, 101040193). The project aims to establish a direct correlation between quasi-in situ surface characterization and the atomic-scale structural and electronic properties of catalysts, with a particular emphasis on improving reaction selectivity in water electrolysis.

Position Details:

- **Duration**: 1+1 years (initial 1-year contract, renewable for an additional year upon mutual agreement)
- Start Date: October-November 2024
- Location: Faculty of Chemistry, UPV/EHU, San Sebastián, Basque Country, Spain

Research Focus:

The postdoctoral researcher will develop a novel experimental methodology that integrates complementary surface-sensitive analytical techniques, such as Scanning Probe Microscopy (SPM) and Near-Ambient Pressure X-ray Photoelectron Spectroscopy (NAP-XPS), to investigate catalytic surfaces under various controllable atmospheric conditions, ranging from single-molecule interactions to electrolyte environments.

The core of the project involves studying layered materials (e.g., graphene, MoSe₂) under ultra-high vacuum (UHV) conditions using **scanning tunneling microscopy (STM)** and **spectroscopy (STS)** at low temperatures (4K). These experiments will reveal the electronic and structural properties of catalyst surfaces with atomic resolution, uncovering the fundamental features of individual active sites. The insights gained will be correlated with quasi-in situ NAP-XPS experiments to develop a comprehensive understanding of the electrode-electrolyte interface under realistic electrochemical conditions.

The position is in the Faculty of Chemistry of the University of the Basque Country, in San Sebastián, Spain, where the candidate will be spending his/her time during the project. This position is funded by the European Union within the program "Horizon Europe" under grant ERC-2021-StG, COSAS, 101040193.







Qualifications:

We seek a highly motivated candidate with the following qualifications:

- Required:
 - PhD in Physics, Chemistry, Chemical Engineering, or a closely related field
 - Extensive experience with ultra-high vacuum (UHV) techniques and lowtemperature scanning probe microscopy (STM/nc-AFM)
 - A strong interest in expanding expertise to electrocatalysis and surface electrochemistry
 - Ability to work independently and within a collaborative, interdisciplinary team environment
 - o Excellent problem-solving skills, creativity, and initiative
- Preferred:
 - Experience with electrochemical methods
 - Familiarity with X-ray Photoelectron Spectroscopy (XPS), particularly NAP-XPS

Benefits:

- Opportunity to work in a state-of-the-art laboratory with access to advanced research facilities and international collaborations
- Collaboration with a dynamic and multidisciplinary research team
- The chance to contribute to a pioneering project in the field of electrocatalysis for sustainable energy production
- Highly stimulating research environment, and unique professional career development opportunities

How to Apply:

Applications should be addressed to Dr. Sara Barja and sent via email in one single PDF, with the subject "COSAS-Postdoc application", to <u>sara.barja@ehu.eus</u>before the 1st of October 2024 (applications will be considered upon arrival) including:

- 1. A cover letter outlining your interest in the position
- 2. Curriculum vitae (CV)
- 3. A short description of previous research (1-2 Pages)
- 4. Contact information for at least two academic references

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