



PhD Fellowship for Supercapacitors Research Line and Surface Science Platform through Basque Government Grant

CIC energiGUNE is looking for a highly motivated candidate with a university degree on Chemistry, or Materials science-Engineering to apply for a Basque Government PhD Grant. [Check eligibility section.](#)

The offer is aimed at students currently completing or who have already completed a master degree in related subjects: materials science, physics, chemistry, engineering, etc.

Candidates must show initiative, independent thinking as well as capability to work in collaborative environments. He/she will be part of a multidisciplinary international research team. Good English level is highly recommended.

Eligibility

The position is subject to obtaining a Basque Government PhD Grant:

<http://www.hezkuntza.ejgv.euskadi.eus/>

In order to be eligible the candidate must:

- Be **resident** in the Basque Country prior to 31st December 2015.
- Be **fluent** in Spanish or Basque language (for the interview process)
- **Grade** obtained in **2012 or after**.
- **Grade records (over 10) higher than: 7.5 in Engineering; .8.0 in Chemistry; 9.0 in Physics.**

Note that those candidates not fulfilling all of the above criteria will be automatically discarded.

PhD project Description

Research Line: Supercapacitors & Surface Science Platform (EES)

Title: Novel materials for electrochemical energy storage applications based on nanosized transition metal nitrides and oxynitrides

Supervisor: *Dr. Oleksandr Bondarchuk/Dr. Eider Goikolea*

The research project will be focused on the study of the relationship between electronic and/or geometrical structures and the electrochemical properties of materials. Atomic scale material properties will be addressed by using model systems made out of thin films and nanoclusters and by characterizing those combining experimental surface science tools with electrochemical testing.

Carbon based electrode materials are extensively used in electrochemical energy storage systems. In supercapacitors they provide long cycle life and high power density, however, their



low specific capacitance limits their usage for high energy density applications. Therefore, to target higher energy demanding applications it is highly required to explore novel materials. Pseudocapacitive metal oxides or supercapacitor oxides exhibit greater charge storage due to the redox reactions occurring at the surface of the material. However, they suffer from low electrical conductivity and poor stability upon cycling. In counterpoint, metal nitrides exhibit better sustainability and excellent electrical conductivity and thus they bring the possibility to develop attractive electrode materials. Within this framework, the core of the work will be the preparation of thin layers and nanoclusters of transition metal nitrides/oxy-nitrides under ultra high vacuum (UHV) conditions and the compositional, chemical and structural transformation analysis of surfaces and interfaces during electrochemical reactions by a combination of x-ray photoelectron spectroscopy (XPS), ultraviolet photoelectron spectroscopy (UPS), atomic force microscopy (AFM), cycling voltammetry and other characterization techniques.

How to apply

To apply for a CIC energiGUNE grant please enter your **CV** and **degree certificate record** through our website <http://www.cicenergigune.com/en/trabajar/>

The selection process ends once a candidate is selected.

CIC Energigune is committed to affirmative action, equal opportunity and the diversity of its workforce.