

Call reference number	(2023-16)
Call name	PhD position: Novel FePd-based nanotechnologies for ultrahigh-sensitivity hydrogen sensors
Application Deadline	2023/03/20

Introduction and main description
<p>BCMaterials, Basque Center for Materials, Applications and Nanostructures, is an autonomous research center launched in June 2012 by Ikerbasque, the Basque Foundation for Science and the University of the Basque Country (UPV/EHU) as a research center for Materials, Applications and Nanostructures. The center is included in the BERC's (Basque Excellence Research Centers) network and its mission is to generate knowledge on the new generation of materials, turning this knowledge into (multi)functional solutions and devices for the benefit of society.</p> <p>BCMaterials is looking for a motivated PhD student to work in the area of FePd nanoparticle and continuous films that can be used in multifunctional sensors working in both contact and wireless modes, and whose properties can be reprogrammed by externally applied magnetic fields. This work is in the frame of Materials for Digitalization and Emerging Technologies, a key strategic area of BCMaterials.</p> <p>The aim of this PhD project is to develop novel multifunctional sensors that can simultaneously work in a number of different modes, including the detection of gases, mechanical strain, biological molecules, and magnetic fields, both using electrical contacts and by remote magnetic-based sensing. The detector element will consist of Pd-rich ferromagnetic FePd alloy films, either produced by conventional sputtering or by depositing size-selected FePd nanoparticles (NPs).</p> <p>The present PhD thesis project will be dedicated to the fabrication, the structural characterization and the analysis of the magnetic properties of FePd-based nanoparticle and continuous films, with the aim of maximizing their sensing performance.</p> <p>The present PhD thesis will be developed jointly by research groups from BCMaterials, the Basque Centre for Materials, Applications and Nanostructures, and the Applied Nanomagnetism Group at the IRICA Institute of the University of Castilla-La Mancha.</p>

Skills and Requirements
<p>Master in materials science, physics or related areas. Bachelor degree obtained with an average mark above 7.5/10. Fluent oral and written English is mandatory. Experience in metallurgy, thin films, magnetic and electric characterization techniques is an asset.</p>

Work Program / Duties / Responsibilities

The research activity that the pre-doctoral researcher will perform consists in the investigation, from the materials growth to their performance evaluation, of FePd-based nanoparticle and continuous films, with a variety of techniques ranging from sputtering, x-ray diffraction, EDX, VSM, etc., to neutron diffraction.

Application Procedure

Apply by submitting a motivation letter and a CV (in English) using the "Contact" button at the corresponding offer, at the "Join Us" area on BCMaterials' portal (<https://www.bcmaterials.net/join-us>).
Your name and email address will be required for further contact too.

Other Relevant Information

Write as much as needed, relating evaluation process, dates of interest.