UNIVERSIDAD DE GRANADA

Ciemat
Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas

PhD POSITION AVAILABLE

A 3 years **PhD position** is available within the **IFMIF-DONES program** to undertake research regarding 'Radiation damage modeling by *ab initio* simulations'. The PhD thesis will be supervised by Dr. Blanca Biel (University of Granada-UGR, https://www.ugr.es/~biel/) and Dr. Christophe Ortiz (CIEMAT, https://www.researchgate.net/profile/Christophe-Ortiz). The PhD candidate will be based in Granada, where he/she will join the 2021-2022 PhD program of the University, and will carry out some stays at the CIEMAT in Madrid. The position is funded by the IFMIF-DONES project and the candidate is expected to start in **January 2022**.

Introduction

During operation of future nuclear fusion reactors, energetic neutrons will be emitted, which will interact with surrounding materials and strongly degrade their mechanical properties by atomic displacements and formation of defects. It is therefore crucial to determine the fundamental properties of these defects in order to predict their long-term evolution and their interaction with the microstructure of the material.

Objectives of the PhD thesis

The candidate will perform calculations in the frame of the Density Functional Theory (DFT) to determine fundamental properties of defects formed in Fe/FeCr or W, in particular defects associated to carbon impurity. Carbon impurity is always present in the material due to the fabrication process and is known to strongly interact with defects such as vacancies formed during irradiation. During this PhD, among others, the candidate will calculate the properties of the carbon impurity and its interaction with other features of the microstructure using DFT.

These properties will be used simulate the long-term evolution of defects using a kinetic Monte Carlo approach. The candidate will work in close collaboration with the project EUROfusion IREMEV (IRradiation Effects Modelling and Experimental Validation), a stimulating and multidisciplinary area involving the experts of Fusion community. The student will get experience in a technological field with high employability

Requirements of the candidate

The applicant must hold a **Masters Degree in Physics, Chemistry or Materials Science**, and must fulfill the requirements to join the 2021-2022 PhD program of the University of Granada. The average mark for their undergraduate and master studies must be above the mark required to apply for a FPU grant (7,12/10). Further information, including full candidate requirements, can be found at https://investigacion.ugr.es/apoyo/nuestros-centros/ifmifdones/contratos_predoc.
Consideration of candidates will begin immediately and will continue until the position is filled.
Please contact **Dr. Blanca Biel (biel@ugr.es)** and **Dr. Christophe Ortiz (christophe.ortiz@ciemat.es)** for further details.