BCAM-TEKNIKER JOINT PHD STUDENT POSITION: MODELLING AND SIMULATION HYDROGEN

Company Description

BCAM is the Research Center on Applied Mathematics created with the support of the Basque Government and the University of the Basque Country, which aims to strengthen the Basque science and technology system, by performing interdisciplinary research in the frontiers of mathematics, talented scientists' training and attraction, so the excellence of our results are recognized by the Society

Information

Deadline: 2022-08-31
Category: Academia
Province: Bizkaia
Country: Basque Country
City: Bilbao

Company

BCAM

Main functions, requisites & benefits

Main functions

We are looking for a PhD student to work on the multiscale simulation of hydrogen-induced embrittlement (HE) of steels. This research will be jointly supervised by Dr. Mauricio Rincon Bonilla from the Basque Center for Applied mathematics (BCAM) and Dr. Iban Quintana from Tekniker. HE is connected to the fast diffusion of hydrogen atoms through the solid material lattice, often by quantum mechanical tunnelling (even at room temperature) followed by interaction with crystal defects, such as vacancies, dislocations, and grain boundaries. Despite great efforts, this process is still poorly understood. Moreover, the in-silico analysis of realistic, multicomponent steel specimens remains a great computational challenge. The student will combine micromechanical and structural characterization techniques to study the behaviour of hydrogen-charged steels prepared at Tekniker. He/she will combine these analyses with hydrogen diffusion simulations developed and performed at BCAM. With this information, we aim to propose strategies for the development of new steels, heat treatments or coatings against HE. Modelling activities will initially focus on the atomistic scale, combining quantum mechanical methods, molecular dynamics and Monte Carlo schemes. The insights obtained from these studies will be incorporated into a multiscale framework to allow direct comparison with macroscopic experiments, as well as the parameterization of continuous phase field or finite elements models.

Requisites

Promising and outstanding young researchers in engineering, mathematics, physics, or chemistry. Experience: At the call deadline, applicants must be in the first year of their research careers and have not yet been awarded a doctoral degree. Studies pursued: At the time of recruitment, candidates must comply with one of the following options: To have completed the studies that lead to an official university degree adapted to the European Higher Education Area awarding 300 ECTS credits, of which at least 60 ECTS credits must correspond to master level. To have completed a degree in a university not adapted to the European Higher Education Area that gives access to doctoral studies. The verification of an equivalent educational level to the ones mentioned above will be made by the university when the admission procedure starts

Benefits

The gross annual salary of the Studentship will be of €18,450 gross annual for the first 3 years and of €22,730 on the fourth year, subject to review. It will then be on his/her responsibility to make a yearly income declaration at the Treasury Agency. Free access to the Public Health System in Spain is provided to all employees. Contract: 4 years