

Call reference number	(2025-13)
Call name	IKUR HPC&AI MUFFINMATT project Pre-Doctoral position: Artificial intelligence techniques for advanced materials modelling
Application Deadline	2025/05/28

Introduction and main description

BCMaterials, Basque Center for Materials, Applications and Nanostructures, is an autonomous research centre located in Leioa (Spain) and established in June 2012 by Ikerbasque, the Basque Foundation for Science and the University of the Basque Country (UPV/EHU). The centre is included in the BERC's (Basque Excellence Research Centers) network, and its mission is to generate knowledge on the new generation of advanced materials, turning this knowledge into (multi)functional solutions and devices for the benefit of society.

Advanced materials are driving revolutionary progress in sectors from renewable energy and electric transport to biomedical devices and smart infrastructure. However, capturing their behaviour, spanning nano to macro scales and involving tightly coupled mechanical, electrical, thermal, and magnetic phenomena, poses a significant computational burden. Multiphysics multiscale materials modelling can resolve these complexities but often require impractical amounts of time and resources, while simplified models sacrifice accuracy and omit critical interactions. The IKUR HPC&AI MUFFINMATT project addresses this dilemma by creating an innovative AI-based framework that seamlessly fuses governing physical equations with experimental observations in a Bayesian deep-learning setting.

The predoctoral candidate will work with experts in computational physics, materials science, applied mathematics, and high-performance computing, you will help establish this technology as the new standard in predictive materials modelling.

This predoctoral position ideal starting date is 01/07/2025. The project funding will end on 31/12/2026.

Skills and Requirements

The candidate must have Master's degree (or close to completion) or equivalent in Engineering, Materials Science, Chemistry, Physics, Mathematics or related areas.
 Capacity for teamwork in an interdisciplinary and international environment.
 Self-motivation and willingness to perform research.
 Creativity in problem solving.
 Ability and eagerness to learn new skills outside own discipline.
 Programming, machine learning and physics simulation knowledge is appreciated although not mandatory.

Work Program / Duties / Responsibilities

The main task of the IKUR HPC&AI MUFFINMATT project is the development of AI-based models to solve advanced materials multiphysics problems. This includes mathematical development, computational programming, materials physics and chemistry theoretical development. Specifically, physics informed and Bayesian neural networks will be developed and multiphysics equations in materials problems will be resolved using finite elements (FEM) and high performance computing (HPC) clusters.

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

We provide a highly stimulating environment with state-of-the-art infrastructures, and unique professional career development opportunities. We offer and promote a diverse and inclusive environment and welcomes applicants regardless of age, disability, gender, nationality, ethnicity, religion, sexual orientation or gender identity.