

Call reference number	(2023-09)
Call name	IKUR Quantum Technologies PhD position
Application Deadline	2023/02/05

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 Quantum Technologies in the scope of the IKUR strategy. IKUR is the strategic program promoted by the Education Department of the Basque Government to boost Scientific Research in specific strategical areas.</p> <p>Over the last decade, a novel class of magnetic metamaterials appeared related as artificial analogues to spin-ice materials, rare-earth titanate materials where the frustration between magnetic moments leads to a playground of fundamental physics studies. These novel materials, dubbed artificial spin ices (ASIs), made of interacting elongated nanomagnets, have emerged as a fertile ground for the study and discovery of novel phenomena not present in natural magnetic materials, bound to a strong inspiration for potential applications.</p> <p>The field of ASIs is currently reaching levels of maturity that bring the state-of-the-art to a position where different pathways emerge as natural alleys for the field to evolve into. In particular, pushing the limits of the nanofabrication skills of the ASIs will eventually allow these systems to be used as playgrounds to prove quantum effects, being this ground-breaking approach the issue of study of the present project.</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 University of the Basque Country.</p>

Skills and Requirements
<p>Master in quantum sciences, materials sciences, physics or related areas. Bachelor degree obtained later than January 2020 and with an average mark above 6.5/10.</p> <p>Fluent oral and written English is mandatory.</p>

Skills and Requirements

Experience in quantum many-body theory, devoted to the simulation and analysis of quantum spin liquids, in general, and quantum spin ice in particular is an asset.

Work Program / Duties / Responsibilities

The research activity that the pre-doctoral researcher will perform consists in the development of quantum lattice gauge theories towards artificial spin ices, including the exploration of frustrated quantum systems, micromagnetic simulations of ASIs and the study of the convergence of the micromagnetic simulations facing theoretical frustrated quantum systems. Special emphasis will be given to study the entanglement properties of these materials and the characteristic signatures to describe them.

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

For more information on this position contact Enrique Rico (enrique.rico@ehu.eus) and Jose María Porro (jm.porro@bcmaterials.net).