

Call reference number	(2026-13)
Call name	Pre-doctoral position within the IKUR program SmartSPE project
Application Deadline	2026/08/09

Introduction and main description

We invite applications for a predoctoral researcher position in Materials Science as part of the *SmartSPE project*, funded by the prestigious IKUR program. This is an exciting opportunity for motivated early-stage researchers to contribute to cutting-edge developments in next-generation energy storage technologies by using advanced neutron scattering.

The project focuses on solid-state electrolytes (SSEs) for lithium-ion batteries, addressing the safety and performance limitations of traditional organic liquid electrolytes. Our research aims to:

- Develop SSEs with enhanced ionic conductivity and lithium transference.
- Incorporate self-healing and self-sensing functionalities to improve battery lifespan and reliability.
- Explore reversible shutdown mechanisms using phase-change materials and thermoresponsive polymers for safer battery systems.
- Apply advanced techniques such as solid-state NMR, quasielastic neutron scattering (QENS), and Small-angle neutron scattering (SANS), and nanoscale simulations to investigate lithium diffusion and interfacial dynamics.
- Establish fundamental design principles for high-performance solid-state batteries (SSBs) tailored for future technological applications.

This position offers not only excellent scientific training but also a robust foundation in transferable skills, thanks to strong collaborations with leading academic institutions and innovative startups in the nanomaterials and energy storage sectors.

Join us in shaping the future of sustainable energy storage as well as neutrons large-scale facilities.

This predoctoral position is offered in the framework of the SmartSPE project with a finishing date on 31/12/2026.

Skills and Requirements

The candidate must have a master in Materials Science, Physics, Chemistry or related areas.

A background in energy storage is desirable but not compulsory. Knowledge in advanced structural characterization techniques, is also desirable.

Proficiency in speaking and writing in English.

Self-motivated and ability to work in a team and willing to coordinate the research in a particular topic.

A high level of motivation and independent thinking abilities.

Ability and eagerness to learn new skills outside his/her own discipline.

Presentation skills and being able to meet the deadline are also required.

Work Program / Duties / Responsibilities

Position Overview

The selected candidate will work at the forefront of materials science, with a primary focus on the design, synthesis, and integration of novel materials for smart solid-state electrolytes. The goal is to create innovative battery systems with enhanced performance, safety, and durability.

Key Responsibilities

- Synthesize and characterize novel materials (e.g., metal-organic frameworks, MOFs) to enhance lithium-ion conductivity through tailored pore interactions and integration with ionic liquids.
- Develop and study new cathode materials, including both conversion-type and intercalation-type systems, as well as engineered interlayers to support efficient lithium plating.
- Incorporate synthesized MOFs into advanced polymer matrices with self-healing or sensing capabilities to enable intelligent response mechanisms in the electrolyte.
- Assemble and test complete battery cells, performing full electrochemical characterization to evaluate performance, durability, and safety under operating conditions.
- Contribute to the development of novel battery architectures, enabling scalable, high-performance solid-state energy storage devices.

Research Environment

The PhD candidate will be fully embedded in a dynamic and multidisciplinary team at BCMaterials, with access to state-of-the-art facilities and equipment. The project involves active collaboration with leading international research groups in Europe and beyond, providing an excellent platform for scientific growth, networking, and career development. The PhD candidate will join to the Energy Research Line under the supervision of Dr. Manuel Salado, (Ikerbasque Research Fellow and Marie Curie Fellow) and Dr. Viktor Petrenko (Ikerbasque research fellow).

This position offers a unique opportunity to contribute to cutting-edge research in sustainable energy storage while receiving comprehensive training in both technical and transferable skills

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

Include contact details for 2 referees.

Interviews will be conducted soon after the deadline.

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.