Marie-Skłodowska-Curie Actions – Postdoctoral Fellowships 2025

INL Expression of Interest

Research Group Leader /Research Group name:	
Paulo Ferreira / Atomic Structure and Composition of Materials	
Scientist in charge:	
Name & surname	Pedro Costa
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Short description of the research group, including URL if applicable *(Strengths and scientific achievements (publications, patents, etc.), important infrastructure (up to 2000 characters with spaces)):*

The group focus on the study of the atomic structure, atomic composition and defect behaviour of nanomaterials, through aberration-corrected TEM/STEM and in-situ TEM/STEM, coupled with EELS/EDS and 4D STEM. In particular, the group is interested in understanding the relationships between the atomic structure, composition and the properties of nanomaterials, and the fundamental mechanisms governing the behaviour of materials. The material systems of interest include battery materials, catalyst nanoparticles for proton exchange membrane fuel cells and water electrolysis, as well as 2D materials.

Research Lines

- Atomic structure, composition and charge distribution of cathode and anode materials, as well as electrode/electrolyte interfaces, in Li-ion and Na-ion batteries.
- Degradation of nanocatalysts and supports for proton exchange membrane fuel cells and water electrolysis
- Atomic defects in 2D nanomaterials, in particular semiconductor and semimetal materials for the generation of electronics and information technologies

Project title:

Understanding atomically controlled EEIs in Li and Na ion batteries by Advanced Electron Microscopy

Project description *(up to 2000 characters with spaces):*

Understanding the electrode/electrolyte interfaces during cycling in solid state Li-ion and Na-ion Batteries through in- situ and identical location Aberration-Corrected Electron Microscopy coupled with EDS, EELS and 4D STEM. In particular, the structure and chemical composition of the electrodes/electrolyte and their interfaces, as well the charge distribution during the charge-discharge cycles, will be investigated.

Research fields *(You may choose more than one)*			
Chemistry (CHE)	x	Life Sciences (LIF)	
Economic Sciences (ECO)		Mathematics (MAT)	
Environment and Geosciences (ENV)		Physics (PHY)	x
Information Science and Engineering (ENG)		Social Sciences and Humanities (SOC)	

Expiration date for Expressions of Interest from postdoctoral fellows:	

Necessary documents to be submitted (in addition to the required CV and motivation letter):