

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	Paulo Ferreira
Contact email	paulo.ferreira@inl.int
Short description of the research group, including URL if applicable (<i>Strengths and scientific achievements (publications, patents, etc.), important infrastructure (up to 2000 characters with spaces)</i>):	
<p>The group focus on the study of the atomic structure, atomic composition and defect behavior 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 behavior 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.</p> <p>Research Lines</p> <ul style="list-style-type: none"> • 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:	
Atomic Engineering: Electron-Beam Manipulation of 2D Materials	
Project description (<i>up to 2000 characters with spaces</i>):	
<p>The main objective of this research proposal is to develop atomic-scale manipulation techniques for two-dimensional (2D) materials using advanced scanning transmission electron microscopy (STEM). The goal is to precisely control the creation and manipulation of structural defects in 2D materials, enabling the fabrication of novel nanostructures for developing new devices at the atomic scale. By integrating experimental STEM imaging with theoretical models, the proposal aims to advance the field of atomic engineering, providing insights into defect formation and the associated material properties.</p>	

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Research fields (*You may choose more than one*)

Chemistry (CHE)	<input type="checkbox"/>	Life Sciences (LIF)	<input type="checkbox"/>
Economic Sciences (ECO)	<input type="checkbox"/>	Mathematics (MAT)	<input type="checkbox"/>
Environment and Geosciences (ENV)	<input type="checkbox"/>	Physics (PHY)	<input checked="" type="checkbox"/>
Information Science and Engineering (ENG)	<input type="checkbox"/>	Social Sciences and Humanities (SOC)	<input type="checkbox"/>

Expiration date for Expressions of Interest from postdoctoral fellows:

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

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