

Expression of Interest-UPM Supervisor

Marie Skłodowska Curie Action–Postdoctoral Fellowship 2026 (MSCA-PF-2026)

Supervisor Name	Carlos J. Ruestes	
Email	cj.ruestes@upm.es	
Department /Institute / Centre Name/Location	Instituto de Fusión Nuclear “Guillermo Velarde”, Departamento de Ingeniería Energética, E.T.S.I. Industriales	
Research Area	Information Science and Engineering (ENG)	Physics (PHY)
Research team/group	<p>MaSaRPro (Materials, Safety and Radiological Protection) is a research group within the Institute of Nuclear Fusion of Universidad Politécnica de Madrid, focused on enabling safe, reliable nuclear fusion. Our work spans radiation–matter interaction and engineering solutions to mitigate extreme reactor environments (high neutron/ion fluxes, thermal loads, corrosion, and synergistic effects). Over the last five years we secured more than €2.50M in regional, national and EU funding and produced +120 peer-reviewed papers. The Institute coordinates the MAMBA MSCA Staff Exchanges network connecting 13 institutions worldwide. We contribute to the national nuclear strategy and offer experimental labs and in-house HPC, with access to UPM’s Magerit cluster.</p>	
Keywords	Materials engineering, Nano-materials, Condensed matter physics, Computational modelling.	
Research Focus	<p>Materials under extreme conditions</p> <p>Successful candidates will work under the supervision of Dr. Carlos J. Ruestes (Ramón y Cajal Fellowship Fellow; former Marie Skłodowska-Curie Actions Postdoctoral Fellow). Research in the group targets plasticity and failure under high pressure/temperature, irradiation, and extreme strain rates, including shock loading and spallation. Recent work covers BCC/FCC metals, refractory systems (e.g., W, Ta), high/medium entropy alloys and porous/nanoporous architectures (e.g., nanoporous Au and W), focusing on defects, interfaces, twinning, phase transformations, and void-mediated damage. Projects combine multiscale simulations: large-scale molecular dynamics for deformation and irradiation-induced defect populations; dislocation-based approaches (discrete slip/dislocation dynamics) for size effects and intermittency; and crystal-plasticity/continuum models for structural-scale prediction. Candidates are expected to propose an original project within these themes, aligned with their expertise and career goals.</p>	
Applications: documents to be submitted and deadlines	CV, publication record and a brief letter of motivation (max. 1–2 pages) outlining your research interests. Candidates are expected to propose an original project within these themes, aligned with their expertise and career goals. Deadline for expression of interests, late April 2026.	