

Expression of Interest-UPM Supervisor

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

Supervisor Name	Mathieu Legrand	
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Department /Institute / Centre Name/Location	Department of Engineering in Mechanical, Chemistry and Industrial Design at Higher Technical School of Engineering and Industrial Design	
Research Area	<p>Information Science and Engineering (ENG)</p> <p>G3-Products and Processes Engineering: Product design, process design and control, construction methods, civil engineering, energy processes, material engineering:</p> <p>Energy collection, conversion and storage, renewable energy</p>	<p>Physics (PHY)</p> <p>P3-Condensed matter physics:</p> <p>- Fluid dynamics</p> <p>P5-Applied physics: Computational modelling</p>
Research team/group	<p>The TE4S (Thermal Energy for Sustainability) research group has a solid foundation in the field of applied thermal engineering, encompassing areas such as thermal energy storage, energy system modelling, concentrated solar technologies, hydrogen production, and advanced power cycles. Its strength is evident in the achievements made in under 20 years, including + 50 patents, + 300 peer-reviewed publications and nearly 50 PhD theses. The group has obtained funding from Spanish and European calls and has established collaborations with research centres (MIT, IASS-Potsdam, Sandia Laboratories) and industrial partners. All these factors foster an excellent environment for generating knowledge, creating and developing new ideas and proof of concepts.</p> <p>More information: https://short.upm.es/8a3zb</p>	
Keywords	Pumped Thermal Electricity Storage (PTES); Laboratory-scale demonstrator; Thermodynamic performance; Experimental–numerical analysis; Energy-storage efficiency	
Research Focus	<p>Experimental and Numerical Investigation of Pumped Thermal Electricity Storage Using a Laboratory-Scale PTES Cycle</p> <p>Pumped Thermal Electricity Storage (PTES) enables the storage of energy as heat and its recovery as electricity, offering a promising pathway for the decarbonisation of the energy sector. This project investigates the operation and performance of PTES using a laboratory-scale facility of about 5 kW. Notably, this is the only prototype of its kind in Spain, which underscores its significance. The experimental platform enables detailed characterisation of thermodynamic behaviour, heat-transfer processes and dynamic response during charge and discharge. Experimental data will be combined with numerical analysis to quantify round-trip efficiency, identify sources of irreversibility and assess component-level interactions. The results will support the development of design and control strategies for next-generation PTES technologies.</p>	
Applications: documents to be submitted and deadlines	<p>CV, letter of motivation, letter of references.</p> <p>Submissions to the supervisor by 24/04/2026.</p>	