

Marie Skłodowska Curie Action –Postdoctoral Fellowship 2023
(MSCA-PF-2023)

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Department /Institute /Centre	Name	Grupo de Investigaciones Termoenergéticas / Group of Thermal-Energy Research ETSI Industriales
	Address	c/ José Gutiérrez Abascal, 2, 28006, Madrid
	Province	Madrid
Research Area		Information Science and Engineering (ENG)
Brief description of the Centre/Research Group		<p>The Group of Thermal-Energy Research, created in 2006 by Prof. Martínez-Val, is currently a well consolidated research group in the field of applied thermal engineering. Among a wide range of research lines in this field, concentrating solar power system is the main focus of the group, including optical design of collectors, design of innovative concentrators, study and development of advanced power cycles and thermal energy storage.</p> <p>The research group has a great commitment with technological development activities: more than 50 patents have been granted, many of them international, and more than 100 papers have been published in high-impact journals. All these outcomes have been raised thanks to the participation in National and International projects, including Plan Estatal, CDTI, FP7 and H2020, and to the collaboration with companies and research institutes at national and international level, such as IASS-Postdam or SANDIA laboratories.</p> <p>During the last 5 years this level of commitment has been strengthened, highlighting the participation in two H2020 projects (WEDISTRIC -GA 857801- and ASTEP -GA884411-), one international private funding project, two coordinated national research project and one public funding innovation project led by the industry. This has led to 6 new national and international patents and more than 30 articles published in high impact journal during these years.</p> <p>Recently, UPM has participated as a main partner in a new Horizon Europe proposal related to advanced concentrating solar power systems based on particle receivers and sCO₂ power cycles.</p>



Expression of Interest – UPM Supervisor

Project description	<p>The future of concentrating solar power is necessarily associated to 3rd generation plants, based on particle central receivers, particle thermal energy storage and sCO₂ power cycles. This solution should lead to very high working temperatures, up to 800°C, that increase the thermal to electricity efficiency of the power cycle and reduce the cost and volume of the storage system. Furthermore, this system would depend on environmentally friendly materials and would lead to low water consumption, as it is the case of current CSP plants. Although these plants are not in the market yet, the technological barrier for the implementation of these systems is being addressed by several entities around the world.</p> <p>The Marie-Curie proposal would be focused on the particle receiver. During the very last few years a number of studies on particle curtains receivers have been published, most of them based on continuous CFD software. Nevertheless, these studies do not provide any specific details about the particle loss that may occur across the receiver aperture, while this issue could play a major role on the receiver performance. In order to develop such study, discrete particle models might be coupled to continuous-state CFD models so that the particulate matter movement can be predicted (Eulerian approach for the continuous phase and Lagrangian approach for the dispersion phase).</p> <p>The Marie Curie Researcher candidate would carry out the following tasks:</p> <ul style="list-style-type: none">• Development of a numerical model of a particle curtain receiver.• Analysis of the dispersion of the particulate matter within the receiver. <p>Characterization of the receiver efficiency through the assessment of different source of losses: radiation, thermal convection and particles dispersion.</p>
Applications: documents to be submitted and deadlines	CV, letter of motivation, letter of references, Eligibility Self-declaration. Deadline: 30/04/2023