

**Marie Skłodowska Curie Action –Postdoctoral Fellowship 2024  
(MSCA-PF-2024)**

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| <b>Contact Person/Scientist in charge</b>             | <b>Name</b>     | Andrés                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                       | <b>Surname</b>  | Sebastián                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                       | <b>Email</b>    | <a href="mailto:andres.sebastian@upm.es">andres.sebastian@upm.es</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Department /Institute /Centre</b>                  | <b>Name</b>     | Thermal Energy for Sustainability (TE4S) Research Group<br>ETSI Industriales                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                       | <b>Address</b>  | c/ José Gutiérrez Abascal, 2, 28006 Madrid                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                       | <b>Province</b> | Madrid                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Research Area</b>                                  |                 | Information Science and Engineering (ENG)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Brief description of the Centre/Research Group</b> |                 | <p>The Thermal Energy for Sustainability (TE4S) research group specializes in applied thermal engineering from component and system level design to numerical analysis and experimental stages. Key areas of focus include concentrating solar technologies, hydrogen production, thermal energy storage, turbomachinery, advanced power cycles, and energy system modelling.</p> <p>TE4S is firmly committed to technological innovation, as demonstrated by the acquisition of over 50 patents, a significant number of which have international recognition, the publication of more than 300 research articles in leading journals, and almost 50 Ph.D. thesis in less than 20 years. These achievements are the result of participation in numerous projects funded by the Spanish and regional governments, the European Commission and the U.S. Department of Energy. TE4S has developed strong alliances with renowned academic institutions and laboratories such as MIT, IASS-Potsdam, or Sandia National Laboratories. In addition, frequent collaborations with industry and private companies in the energy, power, and propulsion sector boost TE4S innovation leadership.</p> <p>For further information, please visit:<br/> TE4S staff members: <a href="https://short.upm.es/qwmqxx">https://short.upm.es/qwmqxx</a><br/> TE4S scientific production: <a href="https://short.upm.es/8a3zbb">https://short.upm.es/8a3zbb</a></p> |

## Expression of Interest – UPM Supervisor

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| <b>Project description</b>                                   | <p>Large-scale energy storage systems are the cornerstone for developing a more sustainable heat &amp; power generation. Although different systems are under exploration, Pumped Thermal Energy Storage (PTES) systems are currently in the spotlight not only from the academic community but also from the industry and demand-side perspectives. One of the key technological hurdles facing PTES is the development of high-efficiency turbomachinery capable of working with non-ideal working fluids. This necessity arises from the requirement of a compressor for the charging process (heat pump) and a turbine for the discharge power cycle. The range of proposed working fluids spans from supercritical carbon dioxide to hydrocarbons such as isobutane or propane. While significant progress has been made in developing the former over the past decade, the design, analysis, and development of turbomachinery operating with the latter fluids remain largely unexplored.</p> <p>Aligned with the turbomachinery research trajectory in TE4S on numerical and experimental characterization on turbomachinery using non-ideal working fluids, the Marie-Curie proposal would be focused on the numerical development of multi-stage non-ideal flow turbomachinery designs for their application to different size proposals of PTES systems. The Marie Curie Researcher candidate would carry out the following tasks:</p> <ul style="list-style-type: none"> <li>- Identification of the turbomachinery design window in vapor compression/expansions in PTES.</li> <li>- Mean-line prediction of multistage axial turbine &amp; compressor.</li> <li>- Turbomachinery numerical analysis and optimization in ANSYS-CFX</li> </ul> <p>This Marie-Curie project offers an excellent opportunity for a postdoctoral researcher to contribute to the forefront of turbomachinery design and its application in advancing sustainable energy storage solutions, playing a pivotal role in shaping the future of PTES technology.</p> |
| <b>Applications: documents to be submitted and deadlines</b> | <p>CV, motivation letter, 2 recommendation letters, eligibility self-declaration.</p> <p>Deadline: 30/04/2024</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |