

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

Supervisor Name	Andrés Sebastián
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Department /Institute / Centre Name/Location	Thermal Energy for Sustainability (TE4S) Research Group School of Industrial Engineering
Research Area	Information Science and Engineering (ENG) Environment and Geoscience (ENV) Physics (PHY)
Research team/group	The Thermal Energy for Sustainability (TE4S) research group focuses on applied thermal engineering, spanning component and system design, numerical analysis, and experimental validation. Its core areas include concentrating solar technologies, hydrogen production, thermal energy storage, turbomachinery, advanced power cycles, and energy system modelling. TE4S demonstrates strong innovation leadership with + 50 patents, +300 peer-reviewed publications, and nearly 50 PhD theses in under 20 years. These results stem from projects funded by Spanish and regional governments, the European Commission, and the U.S. Department of Energy, alongside close collaborations with institutions such as MIT, IASS-Potsdam, Sandia Laboratories, and industrial partners. TE4S portfolio TE4S scientific production .
Keywords	Turbomachinery, heat pump, 3D printing, centrifugal compressors, FEM.
Research Focus	Unlocking the Potential of Small Turbomachinery for Heat Pumps: Simulation, Design & Manufacturing of Soft Centrifugal Compressors This proposal investigates the potential and limitations of soft centrifugal compressors as a transformative technology for small-scale heat pumps. Centrifugal compressors present a promising alternative, potentially delivering superior performance & reduced weight compared to piston or scroll-based solutions. Advances in manufacturing, such as 3D printing with high-performance polymers and multi-component substances, open new design possibilities. This research aims to explore uncharted techno-economic opportunities for next-generation small-scale heat pumps, addressing both performance gaps and sustainability goals. Mechanical design skills together with FEM & CFD are required to address the limitations of this novel solution. Manufacturing and experimentation stage could be conducted at our Laboratory, proving this technology on a small heat pump loop.
Applications: documents to be submitted and deadlines	Please send to the supervisor: CV, motivation letter, 2 recommendation letters Deadline: 24/04/2025