MSCA Postdoctoral Fellowships

HORIZON MSCA 2024 PF

Expression of interest

5th of July 2024

Deadline for submission of documents

instituto IMdea energía

EXCELENCIA MARÍA DE MAEZTU

Contact Person/ Scientist in charge

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Brief description of the Research Group

The R&D unit of High Temperature Processes (HTPU) of IMDEA Energy aims at developing modular, efficient, dispatchable and cost-effective high temperature technologies based on concentrating solar energy for synthesis of solar fuels and chemicals, heat and electricity generation.

Activities on concentrated solar energy target significant improvement of global profitability of solar thermal technologies and increase its contribution in the primary energy consumption and comprise the development of innovative and high-efficient components (solar concentrators, receivers, reactors, and thermal storage modules), the elaboration of testing procedures and measurement techniques under high solar radiation fluxes and/or high temperature, and the design of advanced solar power plants able to create more efficient and modular schemes of hybridization or solar stand-alone systems with heat storage. Besides emerging concepts based on direct solar energy conversion systems replacing current use of thermodynamic cycles are also explored.

The HTPU R&D is supported by singular technical and scientific infrastructure like 4kWe and 42kWe-high-flux solar simulators and a 250kW high-concentration solar tower, a laboratory equipped with instruments for materials synthesis and characterization under high-flux and high-temperature and software and hardware for numerical modelling and simulation.

Project description

The fellow will be mainly involved in the development of direct and chemical solar energy conversion technologies applied to solar thermal power plants using Central Receiver Systems, with operation temperatures in the range of 600 to 1,500 ºC. The project may address technologies for electricity and/or chemicals synthesis. Thermoelectric converters, TPV (thermal photovoltaics), thermionic energy conversion, solar thermo-electrochemical and thermo-catalytic reactors, high-temperature electrolyzers and fuel cells and other. Systems may use solarized modules directly irradiated or indirectly heated through heat exchangers. The project may involve materials design using computational chemistry and artificial intelligence tools, materials synthesis and characterization, experimental research at lab-scale by developing small modules from 0.1 up to 10 kW to be tested with solar simulators, numerical analysis using Computational Fluid Dynamics tools and flowsheeting and system analysis with suitable software to analyze integration and performance in commercial plants

Research Area

- Chemistry (CHE)
- Information Science and Engineering (ENG)
- Mathematics (MAT)
- Physics (PHY)

Applications

Deadline for submission of documents 5th of July 2024. Documents to be submitted:

- Complete curriculum vitae stating background and skills
- Letter of motivation including research interests
- Two reference letters