JUNIOR RESEARCHER

Position: Junior researcher in computational fluid dynamics (CFD)
Offer date: Web publication
Project: CIIAE – REF. IJ-CFD (HIDRÓGENO Y POWER-TO-X)
Department: Hydrogen and Power-to-X
Estimated starting date: 4th quarter 2024

Workplace:	University of Extremadura. Cáceres campus
Tasks to be developed:	**Topic:** Rigorous multi-scale CFD modelling platforms will play a key role in developing and scaling up innovative energy storage, power-to-X and hydrogen conversion systems in the future. Computational modelling of how transport phenomena, material properties and electrochemistry interplay offers invaluable insight into the design, potential and limitations of new technology. CFD modelling allow us to explore the design space, create digital twins and find the most promising systems and process units to be studied experimentally; it allows us to optimise their operation, and to answer the question on how to bring small-scale units into full-scale application. The successful candidate is expected to carry out the following tasks: — Develop, create, and analyse CFD simulations of various types of energy storage, Power-to-X and hydrogen technologies. — Foster collaborations with experimental researchers from CIIAE and beyond. — Provide recommendations to decision makers based on modelling results. — Successfully collaborate with universities, research institutes and companies at national and international level. — Write publications as first author and co-author (e.g., 1.5 paper p.a. in high-ranked journals). — Write research proposals and contribute towards the acquisition of competitive funding, both private and/or public. — Undertake project management and project administration responsibilities (internal and external) within the department, and within the CIIAE. — Become gradually more independent, in order to conduct, manage and lead an independent project. **Challenge:** The multi-scale nature of the processes powering the energy transition is a demanding scientific challenge in CFD. The fundamental physics at play often cut across a wide range of scales, from the microscale properties that underpin reactivity and the development of advanced materials, to the mesoscopic phenomena e.g. bubbling, clustering, driving transport phenomena and flow optimization, to the management of macroscopic limitations to the transport of mass and heat inside full-scale units i.e. a reactor, a fuel cell. A CFD methodology that is all, rigorous, validated

	and tailored, is key to reliably predict the performance and the durability of the next generation of energy storage, Power-to-X and hydrogen conversion systems.	
Duration of the contract and salary:	Temporary Contract Initial duration: September 2025 with the possibility of extension	Annual Gross Base Salary: 36.775,48 €
Academic background required:	A PhD in engineering e.g., chemical, energy and industrial, physics, chemistry, mathematics or related discipline, with a focus in computational fluid dynamics.	
Other education:	Those candidates who are finishing their doctorate with an agreed thesis defence date may also be eligible. In this case, a soft copy of the thesis document must be included in the application **NOTE:** at the time of the formalization of the contract, a document stating the successful thesis defence will be required.	
Professional experience:	N/A	
Job requirements (have to be fulfilled):	**Specific techniques (analytical, software, calculations, prototyping, etc.)**	− Excellent knowledge and deep understanding of physics and chemistry applied to energy storage, hydrogen and Power-to-X e.g., fluid dynamics, electrochemistry, combustion, heat transfer. − Excellent skills / experience in CFD software (i.e. ANSYS and/or OpenFOAM or other opensource CFD tools). − Excellent programming skills, e.g. C++, Python, Fortran. − Statistical skills e.g. statistical tests and regression. − Excellent analytical skills.
	Participation and/or collaboration in R&D&I/business projects	− Proven participation on at least 1 R&D projects
	Languages	− Excellent oral and written skills in English
	Cross-cutting competences	− Commitment to open science in terms of research methods, data, and publications. − Ability to work in a diverse and flexible academic environment in a team-oriented, but independent way. − Experience on collaborating with other colleagues from the same department and beyond

	Willingness to travel and stay abroad	The candidate is expected to travel, both nationally and internationally, in the context of projects and conferences
	Publications: scientific articles (in journals indexed in Web of Science and/or Scopus), theses (PhD and/or Master's), presentations at conferences, reports, technical reports, technical guides, etc.	A strong track-record of publications as first author and/or co-author, given the candidate is expected to publish in top journals in the field. At least 3 publications in Scopus indexed journals. Alternatively, patents, monographs and/or exceptional conference publications could be considered.

To be evaluated (adds points to the final evaluation):
− Knowledge of electrochemistry, electromagnetism and superconductivity.
− Experience with statistical learning models, and machine learning.
− Experience in CAD software in the context of CFD development.
− Experience with Paraview or other engineering visualization software.

− Knowledge of Spanish and/or Portuguese.
− Experience with industrial collaborations and/or previous experience working on industry.
− Motivation letter (maximum 2 pages) included in the application.
− Evaluation provided by 2 references via telephone conversation. The contact details of the references (e-mail and telephone) are to be provided by the candidates in their application.

Selection process details:

Technical test: NO

Language (English): YES **(will be evaluated during the interview)**

Job interview: YES

Interested candidates:

Send all the necessary documentation included in THE RULES OF THE CALL and THE JOB OFFER, as well as THE APPLICATION FOR ADMISSION. Deadline 15 calendar days from the day after the publication on the WEB, indicating **REF. IJ-CFD (HIDRÓGENO Y POWER-TO-X)**

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