## FICHE A COMPLETER POUR PUBLICATION DANS LE PORTAIL « EURAXESS JOBS »

A COMPLTER EN ANGLAIS ET A RENVOYER à : drv-euraxess@univ-amu.fr en FORMAT WORD

❑ Cochez la case si vous souhaitez aussi publier dans **Academic Positions,** plateforme internationale d'emploi scientifique (si visibilité internationale requise par le poste et durée de publication supérieure à trois mois).

**Autres sites ou plateformes d'emplois où votre offre a été publiée**
**1.** **2.** **3.**

- **RESEARCHER PROFILE**
  - ❑ PhD / R1: First stage Researcher
  - X Postdoc / R2: PhD holders
  - ❑ Researcher, Assistant Professor/ Senior Lecturer / R3: Established Researcher
  - ❑ Professor, Tenure track / R4: Leading Researcher
  - ❑ Other _____ (PLS specify)

- **JOB TITLE** (*Ex.: Three-year PhD position in Medical chemistry…. / Two-year Postdoc position in Sociology*)

  **Two-year Post-Doctoral position on experimental and numerical fluid dynamics**

- **RESEARCH FIELD(S) AND DISCIPLINES**[1]
  **Experimental and numerical fluid dynamics**

- **JOB /OFFER DESCRIPTION** *(max. 50,000 characters) (Work environment, Funding (ANR grant, A*midex, …), duty, etc.)*

  Membrane separation techniques, used to separate the constituents of a mixture by driving it through a semi-permeable membrane, are ubiquitous in industry (wastewater treatment), medical sciences (dialysis) or environmental issues (desalination). They suffer from the accumulation of the retained materials near or inside the membrane, which deteriorates their performances, due to various mechanisms such as adsorption, scaling, osmotic pressure or the build up of a gel layer. These mechanisms remain poorly understood, as they are numerically difficult to model and occur near opaque membranes hindering optical measurement techniques. These mechanisms also impact the hydrodynamics at stake in the separation devices. Reciprocally, these mechanisms can also be used to act upon and abate accumulation, by promoting hydrodynamic instabilities for instance.
  This Post-Doc position endeavors to address these phenomena in a Taylor-Couette cell, where brine is driven in the gap between a semi-permeable rotating inner cylinder and a clear impermeable fixed outer cylinder. A two-pronged approach will be adopted over the 24 months of the contract.
  First, building on previous work, direct numerical simulations by spectral methods and stability analyses will be developed, to address in this configuration the dynamics of centrifugal instabilities and solute accumulation, coupled by osmotic pressure.
  Then, an experimental rig must be designed and build. Beyond the coupling by osmotic pressure, its use should also be extended to cope with other mechanisms related to solute accumulation such as mineral scaling. To the best of our knowledge, such an experimental set-up is no longer operated

[1] **Social Sciences** - Law, Education, Economics, Social Science, Psychology - **Political Science** - Political Science - **Computational Sciences** - Computer Science, Mathematics - **Engineering** - Architecture and Design, Engineering - **Natural Sciences** - Biology, Chemistry - **Physical Sciences** - Physics, Space Science - **Environmental Sciences** - Agricultural Science, Geosciences - **Humanities** - Theology, Philosophy, Literature, Linguistics, History, Anthropology, Arts and Culture - **Medical Sciences** - Medicine

anywhere in the world, despite the fact that it offers the best configuration to accurately study the mechanisms at stake in membrane separation. To this end, measurements of the velocity field will be performed by PIV.
Moreover, the postdoctoral fellow will interact with undergraduate and postgraduate students in relation with the experiments.

- **WHAT WE OFFER** *(Benefits, salary, professional opportunities, etc.)*
  Less than 3 years after PhD net salary: 1982 euros / month
  More than 3 years after PhD net salary: 2323 euros / month

The Euraxess Center of Aix-Marseille Université informs foreign visiting professors, researchers, postdoc and PhD candidates about the administrative steps to be undertaken prior to arrival at AMU and the various practical formalities to be completed once in France: visas and entry requirements, insurance, help finding accommodation, support in opening a bank account, etc. More information on AMU EURAXESS Portal

- **TYPE OF CONTRACT**
  ❑ PERMANENT X TEMPORARY ❑ TO BE DEFINED

- **JOB STATUS**
  X FULL TIME ❑ PART TIME ❑ NEGOTIABLE

- **HOURS PER WEEK** _35____

- **IS THE JOB FUNDED THROUGH AN EU RESEARCH FRAMEWORK PROGRAMME?**
  ❑ YES X NO

- **APPLICATION DEADLINE** (Day/Month/YYYY) **& TIME** (00:00) (If not applicable, report the envisaged staring date).
  1st of July 2023

- **ENVISAGED STARTING DATE** (Day/Month/YYYY)
  1st of September 2023

- **ENVISAGED DURATION** (Nb of month)
  24

- **WORK LOCATION(S)**

**IRPHE,** CNRS, Aix Marseille Université, Centrale Marseille, Technopole de Château-Gombert, 49 rue F. Joliot Curie, F-13013 Marseille, France

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- **QUALIFICATIONS, REQUIRED EDUCATION LEVEL, PROFESSIONAL SKILLS, RESEARCH REQUIREMENTS** *(max. 3000 characters)*

  Basic qualification: Ph.D. in experimental and/or numerical fluid mechanics
  The student must have a solid knowledge of fluid mechanics, ideally in both laboratory experimental tasks (PIV installation and measurement) and numerical simulations (spectral methods, HPC), more realistically in one of them.

- **SOFT SKILLS** (*Ex.: Autonomy, Teamwork, Analytical and critical thinking, Listening and observing, Empathy, Flexibility and adaptability, Linguistics, communicative and plurilingual, Co-operation, Conflict-resolution …)*

  Autonomy, Teamwork, Analytical and critical thinking

- **REQUESTED DOCUMENTS OF APPLICATION, SELECTION PROCESS**

  - CV with copy of PhD and committee final report.
  - List of publications.
  - Motivation letter.

- **WHERE TO APPLY** *(Email **OR** Website only)*
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