❑ Cochez la case si vous souhaitez **aussi** publier dans **Academic Positions,** plateforme internationale d’emploi scientifique (si visibilité internationale requise par le poste) : dans ce cas **la durée de publication** – durée entre la date de publication et la date limite de candidature - **DOIT IMPERATIVEMENT être supérieure à 3 (TROIS) MOIS**.

**Autres sites ou plateformes d’emplois où votre offre a été publiée**

**1. LinkedIn 2. ABG 3. Roger Brugge met-jobs list (https://www.met.rdg.ac.uk/~brugge/jobs.html)**

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

**18 months Postdoctoral position in Environmental sciences** on assessing atmospheric methane and hydrogen sources in the Aix-Marseille area (fine scale modeling and field measurements) in the framework of the environmental transition.

**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

**RESEARCH FIELD(S)1**: **Geosciences**

**MAIN SUB RESEARCH FIELD OR DISCIPLINES1: Environmental science**

**JOB /OFFER DESCRIPTION** (max. 3,500 characters) (Work environment, Funding (ANR grant, A\*midex funding, …), duty, etc.

*The work place is located in the south-east of France close to the Mediterranean Sea, 10 km south of Aix-en-Provence and 30 km north of Marseille, on the pine tree covered campus called “Arbois”. It is accessible by public transportation. The hosting institute, IMBE (*[*https://www.imbe.fr/l-imbe.html*](https://www.imbe.fr/l-imbe.html)*), focuses its research activities on studying ecology and biodiversity at different time scales. IMBE is part of the* ***A\*MIDEX/ITEM, the Institute for the Environmental Transition in the Mediterranean Area*** *of Aix-Marseille University (*[*https://www.univ-amu.fr/fr/public/institut-mediterraneen-pour-la-transition-environnementale-item*](https://www.univ-amu.fr/fr/public/institut-mediterraneen-pour-la-transition-environnementale-item)*).*

The proposed job will be conducted in the framework of the **HYFLEX project**, funded by ITEM. HYFLEX is a transdisciplinary project aiming at understanding the stakes and risks - especially on the climate and on the environment - of the energy transition from fossil fuels (mostly natural gas i.e. mostly methane) to hydrogen in the south-east of France, but also the underlying mechanisms such as the perception of these risks by the population, stakeholders and socio-economic actors, for shedding light on the current trajectory and flexibility points of this environmental transition.

As a matter of fact, the Aix-Marseille area is much concerned by the transition to hydrogen, especially through the *Hygreen Provence* project (<https://www.capenergies.fr/projet/hygreen-provence/>). *Hygreen* aims at producing green hydrogen from water electrolysis performed by photovoltaic electricity on the territory of the Durance-Lubéron-Verdon Agglomération (DLVA, <https://www.dlva.fr/mon-agglo-a-decouvrir/connaitre-notre-territoire/connaitre-le-territoire-de-dlvagglo/>), and to store it on the current natural gas storage site Geomethane located at Manosque (<https://www.geomethane.fr/>). Hydrogen would then be transported by pipes to replace fossil fuels in the industrial area of Fos-Berre, west of Marseille - also engaged into several other decarbonation programs (<https://gomet.net/energie-hydrogene-marseille-aix-fos/>) - and further north in Lyon and Grenoble industrial infrastructures.

Hydrogen (H2) is much fugitive, which implies a risk of leaks on hydrogen storage, transport and consumption infrastructures. **Once in the atmosphere, hydrogen would act as an indirect greenhouse. Hydrogen could have other environmental impacts such as the increase of tropospheric ozone and a depletion of the stratospheric ozone layer.** **The environmental footprint of hydrogen also depends on its production chain** (https://www.fastechus.com/blog/the-colors-of-hydrogen-explained). Other environmental risks include fire, explosion, seismicity and impacts on biodiversity.

Hydrogen is supposed to replace fossil fuels and especially natural gas, made mostly of methane (CH4) which is the second direct anthropogenic greenhouse gas and which accounts for about 30% of the Earth global warming since the pre-industrial era. One molecule of methane is equivalent to ~80 molecules of carbon dioxide in terms of atmospheric warming capacity. And since the CH4 lifetime is only ~12 years compare to ~100 years for CO2, methane is a very interesting lever for rapidly reducing anthropogenic greenhouse gas emissions. Methane is already known to leak to the atmosphere on natural gas storage and transport infrastructures (e.g. Xueref-Remy et al, 2020 : <https://cnrs.hal.science/hal-02335881/>). Stopping these leaks is one of the priority of the Global methane pledge agreement signed by about one hundred of countries at the COP 26 (<https://www.globalmethanepledge.org/>), especially since such natural gas storage sites are to be used for the storage of hydrogen (e.g. the Geomethane site), a gas that might leak even more easily as it is smaller and more fugitive than methane. Methane can thus be used as a proxy for assessing future hydrogen leaks on such sites.

Some sites have already tried to store hydrogen, such as the Geomethane natural gas storage site, or to produce hydrogen, such as the Jupiter 1000 site in the Fos-Berre area : these sites can thus already be used to try measuring direct hydrogen leaks to the atmosphere.

We seek for a proactive postdoctoral fellow specialized in Environmental sciences to conduct the following tasks :

1/ Fine-scale modeling of atmospheric methane plumes emitted from industrial sites such as the Geomethane site as a first proxy of potential future Hydrogen leaks, using methane data collected by mobile CRDS (Cavity Ring Down Spectroscopy) measurements started in the Spring 2024, for quantifying the emissions associated to these plumes with a comparison to the local emissions inventory, to help providing better information on current regional greenhouse gas emissions. An attempt at providing a quantitative impact of these leaks on climate through a combination of a literature survey and of the modeling results will be performed.

2/ Attempting at measuring directly hydrogen leaks on industrial sites in the Fos-Berre area already

producing hydrogen, and modeling the associated H2 plumes (or virtual ones in case of no leak) to understand their propagation into the atmosphere.

The methane and hydrogen modeling work will be performed by means of the WINDTRAX fine scale atmospheric dispersion model (e.g. <https://online.ucpress.edu/elementa/article/10/1/00045/192149/Estimating-methane-emissions-from-underground>).

A participation of the postdoctoral fellow to the field campaigns is expected, in collaboration with a phD fellow of the IMBE team. The instrumentation is already set-up for mobile measurements by car (<https://cnrs.hal.science/hal-02335881/>). It comprises a Cavity Ring Down Spectrometer for measuring methane leaks. Air bag sampling is also performed for source identification by 13C analysis in CH4 in collaboration with the RHUL Institute in London, GB. For measuring hydrogen leaks, a commercial detector will be used and possibly gas chromatography measurements performed also in collaboration with RHUL.

Finally, the candidate will be in charge of organizing regular meetings with local, regional and national socio-economical actors and with the consortium team to share results and work together on the stakes, risks and flexibility of the transition to hydrogen, in order to fullfill the transdisciplinary objectives of the Hyflex project.

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

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

**HOURS PER WEEK** \_\_\_\_35\_\_\_\_\_\_

**APPLICATION DEADLINE** (If not applicable, report the envisaged staring date):September 4th,2024 14:00 CEST.

**ENVISAGED STARTING DATE:** between Oct. 10th and Nov. 1st, 2024

**ENVISAGED DURATION**: 18 months

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

If yes, please specify:

**HOW TO APPLY** (Please report ONE value; more contacts may be mentioned in the application process)

E-mail: irene.xueref-remy@imbe.fr

Website: [https://www.univ-amu.fr/fr/public/resultats-aap-item-2020-projets-de-recherche-la-transition-en-action](https://www.univ-amu.fr/fr/public/resultats-aap-item-2020-projets-de-recherche-la-transition-en-action%20/) and <https://www.imbe.fr/irene-xueref-remy.html>

**WORK LOCATION(S):** (Full Name of the Lab & full address in French)

Aix-Marseille Université / IMBE (Institut Méditerranéen de Biodiversité et d’Ecologie marine et continentale) - Bâtiment Villemin - Campus Aix Technopôle de l’environnement Arbois Méditerranée - Avenue Louis Philibert - 13545 Aix-en-Provence CEDEX 4 – FRANCE.

**WHAT WE OFFER:** (Benefits, salary, professional opportunities, etc.)

* Gross salary depending on your professional background : the first year ranging from 2466 € to 2891€/month and the second year (last 6 months) between 2744 and 3169€/month.
* Reimbursement of 75% of the public transportation costs from local home (within Aix-Marseille area) to work place.

**Additional information**: 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](https://euraxess.univ-amu.fr/en)

**QUALIFICATIONS, REQUIRED RESEARCH FIELDS, REQUIRED EDUCATION LEVEL, PROFESSIONAL SKILLS, OTHER RESEARCH REQUIREMENTS (years of research experience** (max. 3000 characters)

The candidate must hold a phD in Environmental Sciences with proven experience in atmospheric sciences and atmospheric modelling. Any experience in studying greenhouse gases and/or the transition to hydrogen are a plus. Experience with field measurements and data treatment is also a plus.

Solid skills in computer programming.

Solid skills in English (reading, writing).

Solid skills in international literature survey and oral/written synthesis.

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

Autonomous, proactive, communicative. Teamwork, flexibility and adaptability, analytical and critical thinking, co-operation with social scientists.

A high level in reading and writing English is required.

A correct communication level in French (speaking, reading, writing) is a strong plus.

A car driving licence is a plus.

**REQUESTED DOCUMENTS OF APPLICATION, ELIGIBILITY CRITERIA, SELECTION PROCESS**

Curriculum vitae, two references (names and contact details), and a motivation letter.

Applications must be sent to Irène Xueref-Remy ([irene.xueref-remy@imbe.fr](mailto:irene.xueref-remy@imbe.fr)) and Pierre Fournier ([pierre.fournier@univ-amu.fr](mailto:pierre.fournier@univ-amu.fr)) before Sept. 4th, 2024, 14:00 CEST. Candidates will be auditioned in the following days (remote interview possible).