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ministère éducation nationale

SORBONNE UNIVERSITÉ

MINISTÈRE
DE L'ENSEIGNEMENT SUPÉRIEUR
ET DE LA RECHERCHE

Job description

Typical job or profession* : Postdoctoral research fellow

* REME, REFERENS, BIBLIOPHILE

Function : Research Scientist
Category : A
Professional body : Post-Doc

Funtional attachment : Fédération IPSL – Institut Pierre Simon Laplace

Hierarchical attachment : Direction de la Recherche et de la Valorisation de Sorbonne Université – Faculté de Sciences et Ingénierie

To submit your application (CV + motivation letter) : Nathalie de Noblet, nathalie.de-noblet@lsce.ipsl.fr, Mathieu Vrac, mathieu.vrac@lsce.ipsl.fr ; Francesca DAU, Direction de la Recherche et de la Valorisation (francesca.dau@sorbonne-universite.fr).

Dead-line for submission of your application: **30 november 2024**

The activities listed in the job description are subject to change according to the knowledge of the profession, service needs, and constantly evolving collaborations.

Presentation of Sorbonne University

To transmit knowledge, understand the world, and meet the challenges of the 21st century, a new university was born on January 1, 2018, resulting from the merger of Paris-Sorbonne University and Pierre and Marie Curie University. Sorbonne University is a multidisciplinary, research-intensive university of global standing. Anchored in the heart of Paris, with a presence in the region, it is committed to the success of its students and strives to address the scientific challenges of the 21st. www.sorbonne-universite.fr

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Presentation of the structure (laboratory, departement of teaching, central service …)

Description (missions, team,…) :

Join IPSL's Cutting-Edge Research on Climate and AI!

The Pierre-Simon Laplace Institute (IPSL) is seeking a highly motivated **Research Scientist** with expertise in **machine learning** (ML)**, deep learning, and statistical learning** to drive groundbreaking advancements in **climate science**. This is an exceptional opportunity to apply ML and data-driven techniques to tackle one of the most critical challenges of our time: **climate change** at a hyper-local scale.

Why This Role?

You will develop and apply **novel machine learning methods** that allow for robust and high-resolution climate projections, tailored to specific landscapes such as agricultural zones, peri-urban areas, and wooded parks within the Paris region. By combining international climate projections (e.g., CMIP6), downscaled using dynamic methods as in the CORDEX exercises, with local data (land use, atmospheric observations, satellite measurements), your work will bring climate projections to a new level of detail and accuracy.

You will also contribute to the **GREC francilien** ("*Regional group of expertise on climate change and ecological transition in Ile-de-France*"), which supports decision-making on climate and ecological transition in Île-de-France. Your contributions will be used directly to shape **climate resilience strategies for major urban centers** like Paris.

Your Impact:

This role will place you at the forefront of **AI-driven climate research** with real-world impact. You will have the chance to create and/or apply tools and models that will **influence urban planning and sustainability policies** for one of Europe's largest metropolitan regions. Your work will also contribute to the **IPSL-Climate-Graduate-School**, helping shape the next generation of climate services.

This is a **12-month renewable position** based at **Sorbonne University**. You'll be working under the guidance of **Nathalie de Noblet** and **Mathieu Vrac**, as part of a highly interdisciplinary team.

Location : Laboratoire des Sciences du Climat et de l'Environnement LSCE/IPSL, UMR CEA-CNRS-UVSQ 8212 (équipe ESTIMR)
CEA Saclay, Bat 714
Site de l'Orme des Merisiers - Chemin de Saint Aubin - RD 128
F-91191 Gif sur Yvette Cedex - France

Job vacancy : as soon as possible
Workload : full time (100%) **Application deadline** : 30 november 2024

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Missions and main activities

Mission (purpose of the position) :

What You'll Do:

- Conduct a state-of-the-art review on the topic of **statistical/ML downscaling for climate** determination at a relatively fine scale, in highly urbanized environments;
- Develop **machine learning models** for **statistical downscaling** to project local climate changes in specific environments (urban, suburban, rural).
- Collaborate with experts in climate science and environmental studies to integrate advanced ML techniques with real-world climate data (e.g., weather stations, remote sensing, SIRTA observatory).
- Produce a comprehensive database of climate projections for the Île-de-France region, including detailed analysis across multiple scenarios (urbanization, climate change).
- Publish breakthrough results in high-impact scientific journals and present them to the scientific community, policy-makers, and at international conferences.

Main activities (maximum 10) :

- Development and application of advanced statistical learning methods
- Collection and analysis of available observations, and incorporation of these observations into statistical method learning
- Analysis of results, changes in multiple variables under climate change
- Establishment of an initial database of territorial projections
- Contribution to writing up the results
- Participation in, and organization of, targeted GREC meetings
- Communication of results to various audiences, including scientists and decision-makers

Supervision : NO
Nb of agents supervised by catégory : /A - / B - / C

Knowledge and Skills*

Skills and knowledge required :

General Skills and Expertise We're Looking For:

We're seeking a highly skilled and motivated individual with a passion for both **data-driven technologies** and **climate sciences**. The ideal candidate will bring a combination of **technical expertise** and the ability to communicate complex ideas to diverse audiences.

Requirements:

- PhD in **machine learning, data science, statistics**, **Statistical analyses of climate simulations**, or related fields.
- Strong expertise in **statistical learning, deep learning, and/or climate modeling**.
- Experience with climate datasets (e.g., CMIP6, CORDEX) is a plus but not mandatory.
- Passion for addressing **global challenges** through **advanced technology**

Key Skills:

- **Statistical and Machine Learning Expertise**: Proficiency in statistical methods for analyzing geophysical data, with a strong interest in applying **machine learning** for climate modeling and downscaling.
- **Climate Science and Ecology Knowledge**: A broad understanding of climate systems and ecological challenges.
- **Programming Proficiency**: Expertise in **Python, R**, or **FORTRAN**, with familiarity in **LINUX environments**. Experience in using these languages for data processing and model development.
- **Meteorological Understanding**: Knowledge of climate models, meteorological observations, and their inherent limitations.
- **Communication Skills**: Strong writing and speaking skills in both **French and English**. Capable of conveying complex scientific information clearly to both technical and non-technical stakeholders.
- **Analytical Thinking**: Ability to analyze large datasets, draw meaningful conclusions, and synthesize insights.
- **Stakeholder Engagement**: An ability to grasp the challenges and concerns of public decision-makers and translate scientific insights into actionable solutions.

Cross-functional skills :

- **Knowledge Communication**: You'll play a key role in **translating technical insights** into practical knowledge for decision-makers, ensuring that your work has **real-world impact**.
- **Collaborative Mindset**: Experience working in **multidisciplinary teams**, ideally bridging the gap between data science, climate research, and public policy.

Soft skills (maximum 3) :

- **Team Player**: Comfortable working in a **collaborative environment**, contributing to a larger team with diverse expertise.
- **Effective Communication**: Strong interpersonal skills, able to effectively communicate and build relationships with **scientists, policy-makers, and stakeholders** alike.

Special conditions of practice :

- **Location and Travel**: This role is based in the **Paris region**, with occasional travel expected within the area to meet stakeholders and collaborate with other teams.
- **Contract and Compensation**: This is a **12-month renewable position**, offering a **competitive salary** based on your experience and skills.

* Conformément à l'annexe de l'arrêté du 18 mars 2013 (NOR : MENH1305559A)