

Job description

Typical occupation or job: Postdoctoral researcher in modelling aviation-climate interactions

Job type: Researcher

Category: A

Body: Researcher

The activities that make up the job description are subject to change in line with knowledge of the profession and service requirements.

Presentation of Sorbonne University

Sorbonne University is a multidisciplinary, research-intensive university. Continuing the Sorbonne's humanist tradition, it is committed to meeting the scientific challenges of the 21st century and passing on the knowledge generated by its laboratories and research teams to its students and to society as a whole.

It provides training for 54,000 students, including 4,700 doctoral students and 10,200 international students, and employs 6,300 teachers, teacher-researchers, researchers and 4,900 library, administrative, technical, social and health staff. Its budget is €670m.

Sorbonne Université, mainly located in the heart of Paris, has first-rate potential and is extending its presence to more than twenty sites in the Ile-de-France region and beyond. Sorbonne Université has an original organisation with three faculties - Arts, Medicine and Science and Engineering - which have considerable autonomy to implement the university's strategy within their own boundaries on the basis of a contract of objectives and resources. University governance focuses on promoting the university's strategy, steering its activities, developing partnerships and diversifying its resources.

Within Sorbonne University, the Faculty of Science and Engineering covers a wide range of scientific disciplines. It comprises 79 research laboratories, 22 training departments and 6 UFR (Unité de Formation et de Recherche) in chemistry, engineering, mathematics, physics, life sciences and Earth, Environment and Biodiversity. It also includes the École Polytechnique universitaire - Polytech Sorbonne -, the Institut d'Astrophysique de Paris, the Institut Henri Poincaré, and three marine stations located in Banyuls-sur-Mer, Roscoff and Villefranche-sur-Mer, the latter three having, with the ECCE-TERRA structure, the status of observatories for the sciences of the Universe. It is home to 20,800 students, including 2,700 doctoral students, and has 4,800 staff - teachers, lecturers, researchers and 3,252 administrative and technical staff.

Presentation of the structure

This position is available in the Faculty of Science and Engineering - <http://sciences.sorbonne-universite.fr>

The IPSL, Institut Pierre Simon Laplace (<https://www.ipsl.fr/en/home-en/>) brings together the expertise of 8 laboratories and 2 associated teams whose specialities concern one or more specific aspects of climate and environmental sciences and the exploration of the solar system. Nearly 1,500 people (researchers and teacher-researchers, engineers, technicians and administrative staff, doctoral students, post-doctoral students and trainees) are spread over ten sites in the Paris region.

The proposed work is funded by the Climaviation project (<https://www.climaviation.fr/en/>), a partnership between Sorbonne University and the French Aerospace Lab (ONERA), funded by the Direction Générale de l'Aviation Civile (DGAC). This project aims to improve the scientific understanding of the climate impacts of aviation. The objectives of the project are: 1) To better quantify the climatic impacts of aviation, in particular the non-CO2 impacts of contrails, aerosol cloud interactions and atmospheric chemistry, 2) To evaluate the impacts linked to new fuels such as synthetic hydrocarbons or hydrogen, 3) To propose solutions to minimise these climate impacts.

Main tasks and activities

Mission (purpose of the post):

The researcher will study the climate forcing and response of cirrus clouds induced by aviation contrails. The work will focus on understanding the mechanisms and processes involved in the evolution of induced cirrus clouds (and in particular their optical thickness and cloud cover), and the response of natural cirrus clouds to the perturbation of the water vapour budget in the upper atmosphere. The work will use numerical simulations using the IPSL climate model, LMDZ, which includes a new parameterisation of supersaturation and induced cirrus clouds.

Main activities:

- Simulate the properties of induced cirrus clouds on a global scale, for a current atmosphere and according to future warming scenarios
- Identify the processes by which natural cirrus clouds adjust to the perturbation of water vapour caused by the formation of induced cirrus clouds
- To present and publish the results of the above activities

Project management: Not planned

Supervision: Not planned

Knowledge and skills

Cross-disciplinary knowledge required:

- PhD in atmospheric, climate or related sciences
- Knowledge of atmospheric physics
- Demonstrated experience in atmospheric modelling, including large-scale climate simulation with CMIP-type models.
- Demonstrated knowledge of Fortran programming
- Knowledge of the Python programming language and associated scientific libraries
- Knowledge of Unix/Linux and bash programming

Skills:

- Excellent writing of scientific articles
- Excellent oral and interpersonal communication skills
- Ability to plan work and work independently towards general objectives

Cross-disciplinary skills:

- Scientific rigour
- Initiative and adaptability
- Ability to work in a team with a wide range of expertise

People skills:

- Excellent interpersonal skills
- Sense of service
- Reliability

Additional information

Work place: Your office will be located on Climaviation's premises, at the Institut Pierre-Simon Laplace (IPSL) on the Pierre-et-Marie-Curie (Jussieu) campus of Sorbonne University in Paris. You will be joining a team of around ten people. Work meetings will be held in Palaiseau (ONERA), Saclay (LSCE) and Toulouse.

Type of contract: 12 or 24-month fixed-term contract, depending on profile

Gross monthly salary: Depending on experience, from €2900 gross per month

Desired start date: Autumn 2023

To apply, send a CV, two references and a covering letter to gregoire.dannet@ipsl.fr, olivier.boucher@ipsl.fr and nicolas.bellouin@ipsl.fr.