



Laboratoire Inter-Universitaire des Systèmes Atmosphériques

Postdoctoral Research fellow : Studies of gas-phase measurements during ACROSS airborne field campaign (<https://across.cnrs.fr/>) at the Laboratoire Interuniversitaire des Systèmes Atmosphériques (LISA / www.lisa.u-pec.fr), CNRS/Université Paris-Est Créteil/Université de Paris

Context

The mixing of emissions of anthropogenic and biogenic origins can affect several atmospheric chemical processes. Competition for oxidants between anthropogenic and BVOCs could possibly lead to formation of SOA with different yields and properties. Also, elevated NO_x (mostly of anthropogenic origin) could impact biogenic VOC oxidation pathways. While recent laboratory investigations support the role of anthropogenic–biogenic mixing in affecting air mass evolution and the properties of its constituents, a detailed and predictive understanding of the mechanisms occurring in such mixed environments is poorly understood.

Therefore, ACROSS (Atmospheric ChemistRy Of the Suburban foreSt) is an integrative, innovative, large-scale project awarded under the “Make Our Planet Great Again” (MOPGA) framework that seeks to definitively improve understanding of the impacts of mixing urban and biogenic air masses on the oxidation of atmospheric VOCs. The overall ACROSS strategy is to apply a multiple platform approach to an intensive measurement campaign to be held in summer 2022.

The ACROSS Airborne Observations (ACROSS-AO) project, funded by the French National research Agency ANR, seeks to greatly enhance understanding of the evolution of the composition of mixed urban/suburban/rural air masses and its impact on air quality at the regional scale, on ecosystems and on climate. The project focus on the role of oxidation of volatile organic compounds and reactive nitrogen compounds in mixed environments on the formation and aging of secondary organic aerosol and on their properties.

Core to the ACROSS-AO project is the execution of an airborne atmospheric composition measurement field campaign that is aligned and coordinated with ground-based measurements. Within this campaign, measurements of atmospheric composition of gas and aerosol phase and aerosol properties using instruments staged on an aircraft platform (the ATR-42 aircraft from the French SAFIRE fleet) will be conducted.

Missions

The candidate will perform the preparation and validation of instruments dedicated to the gaseous phase measurement during the ACROSS-AO airborne field campaign and will also perform the measurement during the campaign. The candidate will then perform the data analysis of the chemical composition of the organic gaseous phase (VOC and organic nitrates) in combination with the concentrations of inorganic trace gases (NO_x, O₃, CO etc.) and the data of chemical composition and properties of aerosol in order to study the impact of mixed anthropogenic/biogenic air masses on oxidation pathways of organic compounds, on the budget of reactive nitrogen compounds and on the formation and growth of the organic component of aerosols.

Activities

The successful candidate will work closely with national and international collaborators and is expected to participate to the ACROSS-AO airborne field campaign.

The role will involve:

- Carry out the measurement of the gas phase instrumentation on board the aircraft during the ACROSS field campaign, with a special emphasis on PTR-TOF-MS and TD-LIF operation
- Perform the calibration and data validation of PTR-TOF-MS and TD-LIF instruments prior, during and after the campaign
- Perform the data analysis
- Present results at national and international meetings
- Publish results in high-impact peer-reviewed journals

Candidate Skills and abilities

Applicants should hold a doctorate/PhD in either atmospheric physics or chemistry, or related field, with a strong experience in field experimental work (volatile organic compounds, organic nitrates and/or mass spectrometry).

Candidates are expected to demonstrate:

- Ability to perform field experimental work (experience in airborne measurement is beneficial)
- Ability to work collaboratively, yet independently, as part of a team
- Ability to interpret and combine field experimental results from multiple and diverse instruments
- Strong computing skills, including the knowledge of at least one of the following high-level languages for analysis of large datasets: R, Python, Igor, Matlab....
- Good English language skills.

Working Environment

The *Laboratoire Interuniversitaire des Systèmes Atmosphériques* (LISA) is an international leading French institution in atmospheric chemistry and physics for climate, air pollution and human health.

Joint research unit of the CNRS, the University Paris-Est Créteil and University of Paris, the LISA is based in Créteil, in the outskirts of Paris, less than 30 minutes by public transport (metro and suburban train) from the Paris city centre.

The successful candidate will benefit of the international working environment of MEREIA group at LISA (>15 staff members, post-doc and graduate students of more than 5 nationalities), and will profit from an interdisciplinary, innovative and dynamic extensive training, in addition to personal development possibilities.

This position will imply work at the University of Chieti-Pescara (Italy) for instrumental preparation and validation before the campaign and data treatment and meeting after the campaign.

The contract will be for 18 months.

Net monthly salary around 2100 euros, depending on experience.

Please direct enquiries on application to:

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For application please follow the link : <https://bit.ly/3DkxQao>