

Postdoctoral Position on the formation of Secondary Organic Aerosol in clouds

A postdoctoral position of one year is available at the Laboratoire de Chimie de l'Environnement, CNRS-Université Aix-Marseille, France.

The successful candidate will investigate cloud processes able to process organic constituents and produce organic aerosol particle mass, in the framework of the project PARAMOUNTⁱ. Multiphase photochemical production of Secondary Organic Aerosol (SOA) will be investigated in the CESAMⁱⁱ atmospheric simulation chamber. These processes will start from a single - and a mixture of several - Volatile Organic Compound (VOC), such as polyfunctional carbonyl and organic acid components. Their photooxidation will be monitored in the chamber in the presence of inorganic seed aerosols at constant relative humidity, which will be increased up to 100% to simulate cloud evapo-condensation cycles. Such experiments will simulate multiphase cloud processes of polyfunctional VOCs under real atmospheric conditions in terms of solar UV-visible irradiation, temperature, and inorganic aerosol. The goal is to experimentally assess whether cloud processing leads to irreversible organic particle mass increase.

The CESAM chamber will be run using the full range of its analytical equipment for the gas and particulate phase chemical and physical characterization. It will be complemented by on-line and off-line instruments such as those of the mobile MASSALYA platformⁱⁱⁱ, operated by the candidate. The platform includes an Aerosol Mass Spectrometer (HR-ToF-AMS), an SMPS and a Proton Transfer Reaction Mass Spectrometer (PTR-ToF-MS); Additional off-line analysis of the particles will be performed by the candidate including filter sampling from the chamber and extraction prior to GC-MS and LC-Q-ToF-MS analysis in the laboratory. The candidate will operate these instruments during the campaigns, he/she will prepare each campaign with small test experiments, he/she will treat the corresponding data and will participate to the consortium meetings for data interpretation, report writing as well as article writing for publication of the results in international journals.

The outputs of the project will assess the significance of cloud atmospheric aqueous processes for the formation of new SOA. The candidate will take benefits from scientific exchanges, and data acquired by the other groups participating in the campaigns (LISA-CNRS-Université Paris Est Créteil and IFT-Leipzig).

A Ph.D. in atmospheric sciences, analytical chemistry, environmental sciences, technical instrumentation, or a related discipline is required. Experience in mass spectrometry and monitoring instrumentation is required. Experience in complex data analysis using for example Igor Pro is highly desirable. Independence, drive and collaboration are important and will be encouraged in order to develop the candidate's career.

The position will be located at Marseille, France, at LCE, in the down town university campus (St Charles). The initial appointment will be for one year, starting in September-October 2019, with the expectation of renewal for a second year upon satisfactory performance. The Salary will be based on experience and performance according to the Aix-Marseille university salary scale (approx. 23,000 € to 30,000 € per year)

To apply, please submit an application via email to anne.monod@univ-amu.fr with a cover letter describing your research interests, a CV, date of availability, list of publications (submitted and in preparation papers can also be included), and a list of reference persons before April 20th 2019.

References:

- Brégonzio-Rozier L., Giorio C., Siekmann F., Pangui E., Morales S.B., Temime-Roussel B., Gratien A., Michoud V., Cazaunau M., DeWitt H. L., Tapparo A., Monod A., Doussin J.F., Secondary Organic Aerosol formation from isoprene photooxidation during cloud condensation–evaporation cycles, *Atmos. Chem. Phys.*, 16, 1747–1760, 2016
- Giorio C., Brégonzio-Rozier L., Cazaunau M., Temime-Roussel B., DeWitt H.L., Gratien A., Michoud V., Pangui E., Ravier S., Zielinski A.T., Tapparo A., Vermeylen R., Claeys M., Voisin D., Kalberer M., Doussin J.F., Monod A. Cloud processing of secondary organic aerosol from isoprene and methacrolein photooxidation. Virtual Special Issue in honor of Veronica Vaida. *J. Phys. Chem. A*, 121 (40), 7641–7654, 2017

ⁱ Production of aerosol particle organic matter in clouds: chamber and laboratory studies, mechanisms, modelling and integration (<http://www.agence-nationale-recherche.fr/Project-ANR-18-CE92-0038>)

ⁱⁱ <http://www.cesam.cnrs.fr/>

ⁱⁱⁱ <https://lce.univ-amu.fr/en/massalya>