

UNDERSTANDING ATMOSPHERIC HG REDOX TRANSFORMATIONS FROM NOVEL FIELD
OBSERVATIONS AND 3D ATMOSPHERIC HG MODELS – ESR1

Univ Grenoble Alpes, Institut des Géosciences de l'Environnement in Grenoble (France), Chianti Team, Co-supervised by Aurélien Dommergue and Jeroen Sonke

Contact : aurelien.dommergue@univ-grenoble-alpes.fr

Online application : <https://www.gmos-train.eu/esr/projects/>

Deadline for application : March 1st 2020

Funding : 3yrs contrat starting as of May-september 2020. Gross salary : about EUR 3 270 per month - deduce about 40% for an approximate net salary. Mobility Allowance: This is a monthly amount of EUR 600. Should you have a family at the time of your recruitment, you are entitled to an additional 'family allowance' of EUR 500 per month.

Topic

Atmospheric oxidation of the dominant emitted Hg(0) form is a key process whereby Hg from natural and anthropogenic sources is converted to more soluble and reactive Hg(II) species that will be deposited to ecosystems. Recent theoretical, field and experimental studies have proposed new atmospheric Hg redox pathways, including alternative oxidants, and direct photoreduction of Hg(II) forms. These new pathways need to be integrated in atmospheric Hg models and tested against observations of atmospheric Hg and oxidant dynamics. Objectives: To improve understanding of atmospheric Hg observations including the role of key oxidants, photoreduction and reemissions.

Methodology & Expected Results: This project relies on previously made Hg observations, and on state of the art atmospheric Hg models. The spatial and temporal variability of Hg(0) and Hg(II) species concentrations along with some oxidants (BrO, NO_x, O₃) will be investigated in regions where high oxidation rates are observed or suspected (polar regions, high altitude sites, tropical regions). An improved understanding of Hg(0) re-emission sources (snow, sea-ice, ocean, land) and their role in the atmospheric Hg budget will be proposed using available 1D and 3D atmospheric models. Improvement of reactions schemes and parametrization of Hg(0) oxidation and Hg(II) reduction using the latest version of the models (i.e. GEOSChem 3D) will be tested in high oxidation environments, using recent UGA/CNRS data and GMOS, AMNET data.

Profile

Education and/or Training in atmospheric chemistry (chemistry) required with skills in data processing, and programming language. Autonomy, creativity and scientific rigour. Ability to write in English in a concise manner and excellent communication skills including reading, speaking, and writing.

Specific criteria for eligibility: ITN offers funding for early-stage researchers only. To be eligible for recruitment within an ITN project, you therefore must – at the date of recruitment – be within the first four years (full-time equivalent research experience) of your research career and not have a doctoral degree. Full-time equivalent research experience is measured from the date when you obtained the degree entitling you to embark on a doctorate (either in the country in which the degree was obtained,

or in the country in which you are recruited), even if a doctorate was never started or envisaged. You may therefore be required to provide documentation proving your eligibility for recruitment. The MSCA are a researcher mobility programme. You are therefore required to undertake transnational mobility in order to be eligible for recruitment in an ITN project. As such, you must not have resided or carried out your main activity (e.g. work, studies) in France 'for more than 12 months in the 3 years immediately before the recruitment date'⁵. Holidays are not counted. Your employer is required to verify this fact, therefore you may be required to provide supporting documentation proving your place(s) of residence or work during the previous 3 years. Note that the mobility rule applies only to your first recruitment within the project, and not to other organisations to which you might be sent on secondment or at which you may subsequently also be recruited. Finally, the mobility rule is related to your residence or main activity and not to your nationality.

Important information

This phd is part of a larger european program called GMOS train where 14 other phd student will be recruited and trained together throughout Europe <https://www.gmos-train.eu/esr/projects/>

Several training events are mandatory. Prestigious EU fellowship. Highly competitive and attractive salary and working conditions. Excellent training programme covering health and environment science and state-of-the-art technologies. Develop multidisciplinary research skills. Be part of a team of leading scientists in different fields of academia. Establish a professional network in industry and academia. Visits and secondments to other project partners within industry and academia for up to 30% of your appointment period.