Post-doctorate

Urban fine-scale mapping over Paris region for pollutants of health interest

Background :

Very high concentrations of particulate matter are frequently observed in urban areas, particularly due to the proximity of sources: traffic, residential sector, industries. Particulate matter compounds can be primary, but also secondary (i.e. formed by physicochemical transformations of gaseous precursors). The formation of secondary compounds is strongly influenced by nitrogen oxides emitted largely by traffic. The spatial heterogeneity of the urban environment and the proximity of sources make the modelling of aerosols and particles complex, as the characteristic times of evolution are small and require a fine representation. The high concentrations observed in the urban environment have an impact on visibility, buildings and, above all, on people's health.

Objectives :

We are seeking an enthusiastic and capable scientist to map urban air quality through multi-scale modelling for pollutants of health interest (organic aerosol, ultrafine particles, black carbon). Urban fine-scale modelling is essential to represent the population outdoor exposure to pollutants, to understand the sources of pollution and how to remedy them. You will use a regional chemistry-transport models and a street network model for downscaling concentrations to the streel level over the Paris region, taking into account all pollutant sources and secondary aerosol formation. You will work on numerical aspects in the modelling of ultrafine particles, and on model to measurement comparisons for model improvements and to better characterise emission factors of black carbon and ultrafine particles. This work is funded by the European project RI-Urbans (Research Infrastructures Services Reinforcing Air Quality Monitoring Capacities in European Urban & Industrial AreaS) and the French ademe project ENZU (Evolution of the number of particles in urban areas).

Profile A PhD or equivalent experience in areas related to air quality, climate science, aerosol modelling, computational physics. Familiar with LINUX environment. Python.

Based in CEREA, l'École des Ponts ParisTech, Cité Descartes, 6-8 avenue Blaise Pascal, 77455 Marne-la-Vallée.

Duration : 15 months (renewable for a further 15 months).

Contacts : Please send your application (CV + cover letter) to Dr Karine Sartelet (karine.sartelet@enpc.fr)

The laboratory:

CEREA is a joint laboratory École des Ponts ParisTech-EDF R&D. It is part of the Institute Pierre-Simon Laplace (IPSL).