ULB UNIVERSITÉ LIBRE DE BRUXELLES, UNIVERSITÉ D'EUROPE

Post-doctoral position in Antarctic dust Geochemistry (3 years)

BELGIAN RESEARCH ACTION THROUGH INTERDISCIPLINARY NETWORKS

Hosting Laboratory: Université Libre de Bruxelles (ULB), Belgium

At the G-Time Laboratory (Geochemistry: Isotope, Mineral and Element Tracing), ULB (N. Mattielli), in close collaboration with the Royal Meteorological Institute of Belgium (A. Mangold), and the Analytical-, Environmental-, Geo-Chemistry (AMGC) group at the VUB (Ph. Claeys).

Subject title: Unravelling Particle Chemistry in Dronning Maud Land (Antarctica): from atmosphere to surface snow

Research Area: East Antarctica; geochemical characterisation of airborne particles and dusts in surface snow

Description of the project:
Atmospheric composition change is a main driver of present and near-future climate change with airborne particles (AP) playing a major role therein. The impact of mineral AP as a major source of micronutrients (e.g. Fe) in the so-called "High Nutrient Low Chlorophyll" oceanic zones (like the Southern Ocean) that affects the global CO_2 cycling, illustrates the close and complex relationships between the composition of atmospheric particles and global climate.

However, the aerosol fluxes and sources in Antarctica and its closely associated Southern Ocean are poorly constrained, in particular the particle chemistry. Antarctica is considered the best preserved region on Earth from anthropogenic emissions. However, the impact of anthropogenic airborne particles and pollutants could be significantly larger than expected. Furthermore, a detailed understanding of present-day atmospheric transport pathways of particles and of volatile organic compounds (VOC) from source to deposition in Antarctica remains essential to document biogeochemical cycles and the relative importance of natural and anthropogenic compounds, which are not well constrained at the moment. This information is relevant to interpret climatic data extracted from ice cores and the transport and deposition of not only mineral nutrients, but also and essentially of organic micro-pollutants in polar regions.

The project provides detailed physical-chemical analyses of both atmospheric and surface snow particles recovered near the Belgian research station Princess Elisabeth (PE), Dronning Maud Land, East Antarctica, and thoroughly investigates their atmospheric transport pathways. Such detailed studies have never occurred in the region where PE station is located.

The determination of the inorganic composition of AP will be done by both passive and

active sampling. Single particle morphological and chemical analyses will be done by automated-FEG-SEM-EDS analyses and both geochemical (major and trace elements) and Sr, Nd, Pb isotopic analyses by HR-ICP-MS and MC-ICP-MS, respectively. Isotope Ratio Mass Spectrometry (IRMS) will determine the stable isotopic signature (C, N) of the different types of organic material recovered.

Additional job details:

The initial hiring is be first for a one year period, and will be renewed/extended for the full 3 years based on performance

The position will be open by the end of October 2017.

Applications must be submitted by e-mail to nmattiel@ulb.ac.be with the following subject "*Application for a post-doc position to CHASE*".

Application must contain pdf files of:
- Cover letter
- Detailed Curriculum Vitae
- Names and contact details of at least two references
- Copy of degree certificate
- Other documents considered relevant (selection of scientific publications, etc.)