



PhD scholarship in Geography/Geosciences (3 years)

## Reconstruction of past climate changes and anthropogenic impact on landscapes during the late-Holocene in Normandy

### • Context

The PAL-ANTRO-NOR PhD scholarship is part of the PALECONOR project (2019-2022) funded by the Normandy region. The project aims to better constrain the past response of terrestrial ecosystems to climate change in Normandy (France) for the late-Holocene period, using terrestrial carbonates (tufa, speleothems) as a coupled archive for climate and ecosystem reconstructions. (link: <http://umr-idees.fr/2020/04/06/pal-eco-nor/>).

The PhD project is focused generally on the reconstruction of past climate changes, but more particularly on the anthropogenic impacts on ecosystems from the Gallo-Roman period to the 20<sup>th</sup> century, by coupling geochemistry analysis (trace elements, stable isotopes) and dating methods on carbonate deposits (speleothems, tufa) with investigations in geo-historical archives (ancient maps, documentary sources) on landscape mutations for the last centuries. On one hand, investigations in geo-historical archives on land use in Normandy is envisaged by focusing on the construction of a spatial database (GIS) based on archaeological, historical sources, old maps and aerial photos for several sites. The objective is to reveal a general trend of the landscape evolution in Normandy for the last centuries. On the other hand, the candidate will investigate the potential of speleothems to serve as high-resolution coupled archives for past climate and ecosystem conditions. Several speleothems and tufa will be analysed at several resolution levels (annual, decadal, multi-centennial) using geochemical analysis and dating methods (U/Th, C14). A particular focus will be on reconstructing anthropogenic impact for the late Holocene period and paleo-pollutions trends (Pb, S) over a more recent period.

### • Profile

We seek a highly motivated student holding a Master degree in geology, physical geography, chemistry, environmental sciences, biogeochemistry, or related disciplines. Previous experiences with analytical methods and field work are welcome. Some basic knowledge in Geographic Information System is essential. A keen interest in lab work in several institutions, motivation to work in a multidisciplinary team (geomorphology, geography, geochemistry, archaeosciences) and abilities to exchanges with several French and foreign research groups are essential. Good oral and written communication skills in French and English are mandatory.

### • Institutional context

The candidate will be member of the UMR IDEES 6266 CNRS and will work in close collaboration with the research group "**Past and present societal-environmental interactions**" during field visits, lab work and scientific meetings. This research group works closely with several French and foreign laboratories and the candidate will perform most of the geochemical analyzes at Laboratoire des sciences du climat et de l'environnement (IPSL/LSCE UMR 8212 CNRS) as well as at other European laboratories.

### • Application and contact

Application deadline: 10<sup>th</sup> September, 2020. The 3yr contract starts shortly thereafter and the salary is according to University guidelines. The contract is based at the University of Rouen (Mont-Saint Aignan Campus) within the UMR IDEES (<http://www.umr6idees.fr/>) and the HSRT doctoral school of the COMUE-Normandie Université. The application must include a CV and a motivation letter and sent to the following email addresses: [damase.mouralis@univ-rouen.fr](mailto:damase.mouralis@univ-rouen.fr); [carole.nehme@univ-rouen.fr](mailto:carole.nehme@univ-rouen.fr). Supervision team: Damase Mouralis (Pr-Geomorphology), Carole Nehme (Lecturer, Geomorphology/Paleoclimatology), Edwige Pons-Branchu (Lecturer-Hab, Geology, geochemistry)