

The Scientific Service Gravimetry and Seismology of the Royal Observatory of Belgium and the Unit of Physical Geography and Quaternary of the University of Liège recruit

### **A postdoctoral researcher in earthquake geology and tectonic geomorphology**

#### **Background**

In the frame of the FED-tWIN programme of the Belgian Science Policy Office *BELSPO* aimed at promoting research cooperation between Federal Research Institutes and Universities in Belgium, the Scientific Service Gravimetry and Seismology (SSGS) of the Royal Observatory of Belgium (ROB) and the Unit of Physical Geography and Quaternary (UGPQ) of the University of Liège (ULiège) are recruiting a postdoctoral researcher in earthquake geology and tectonic geomorphology.

The research project he/she will have to lead requires two lines of expertise, in which the SSGS and UGPQ research groups have built a strong tradition. Earthquake geology and paleoseismology, a research topic developed over the past two decades at ROB, involves identifying active faults and folds, analyzing coseismic deformation of sediments in the shallow subsurface, and determining the size and timing of past large earthquakes. Tectonic geomorphology, a strong research topic at UGPQ, investigates and maps the expression of active tectonic deformation in the landscape and topography in order to quantify the amount and rate of deformation. Taking advantage of the know-how of both research groups, the FED-tWIN researcher will ensure the continued development of active tectonic studies in Belgium, with the objective of expanding our knowledge of active faults and the link between surface deformation and past large earthquakes in intraplate Europe.

#### **Function**

The recruitment aims to implement the selected research profile "Prf-078 FAULTCOLLAB - Earthquake geology and tectonic geomorphology of active faults in intraplate context". The long-term scientific objective of the associated research project is to advance – within the specific context of the intraplate region of Northwest Europe, characterized by low seismic activity (but episodic strong earthquakes) and low rates of deformation – our understanding of:

- active faults, their behavior (seismic and aseismic components) and rate of deformation;
- the recording of past large earthquakes in the landscape and in the sedimentary record;
- the history (size, timing) of large earthquakes on individual faults or fault segments.

The candidate will build on previous results obtained in this area by ROB and UGPQ and conduct new researches in particular in the Roer Valley Rift System (RVRS) and the Hockai Fault Zone of Eastern Belgium.

The first two years of the FED-tWIN researcher's activity will be dedicated to expanding the paleoseismic record on the southwestern border faults of the RVRS. This will include:

- detailed field- and LiDAR-based analysis of the topographic expression and along-strike geometry of the faults;
- systematic inventory and critical analysis of existing Quaternary fault-displacement data and associated uncertainties;
- collecting new data to extend this inventory;
- performing geomorphic and geophysical investigations at selected sites that are most likely to contain a record of paleo-earthquakes;
- exploring alternative techniques of investigation, e.g., shear-wave seismic reflection profiles across faults to bridge the gap between near-surface geophysics and existing traditional seismic-reflection data; recording seismic ambient noise to image the faults at greater depth; exploring innovative remote sensing techniques, etc.

In parallel, we expect the FED-tWIN researcher will establish collaborations with international teams involved in paleoseismic and tectonic studies in the Euregio (Belgium, The Netherlands, Germany). These efforts will lead to the realization of new paleoseismic trenches in the following years, in order to increase the spatio-temporal record of paleo-earthquakes in the RVRS.

All planned tasks will be performed in close interaction with the SSGS and UGPQ teams, to both of which the researcher will be affiliated (as scientific staff - SW2 Workleader at ROB; as postdoctoral researcher at ULiège) and between which he/she will distribute his/her work time according to a bilateral agreement associated with

the research profile. In particular, the researcher will have teaching duties in the UGPQ of ULiege, including an optional course presenting matters in its main field of expertise and, from 2022 onwards, the course of "Quaternary Geology and Geomorphology" for undergraduate students in Geography, Geology, and Archaeology.

### **Competences**

The candidate will hold a Ph.D. degree in Earth Sciences obtained at the earliest 12 years prior to the submission date of the job application. The 12-year period is extended by one year for each maternity, parental & adoption leave of the candidate & for each long-term sick leave of the candidate or his/her immediate family. Ideally, the candidate will have expertise in active tectonics, tectonic geomorphology or earthquake geology. A Ph.D. in a different field might be acceptable if the candidate can demonstrate equivalent experience in one or more of those fields. Additionally, the candidate will have good general knowledge of Quaternary geology and skills in one or more of the following fields: near-surface/exploration geophysics, seismology, remote sensing, spatial analysis. Experience in, or a good understanding of, dating techniques is an advantage.

Experience in teaching at bachelor and master levels will also be valuable. In principle, teaching at the bachelor level at UGPQ is in French.

Fieldwork experience is a decisive selection criterion.

### **Practical information**

**Applications have to be sent to Dr. K. Vanneste ([kris.vanneste@oma.be](mailto:kris.vanneste@oma.be)) before November 29, 2019, 12pm.**

Time window for signature of the employment contracts (one part time at ROB, one part time at ULiege): January 1<sup>st</sup>, 2020 – October 15<sup>th</sup>, 2020

Workplaces: **at ROB:** Gravimetry and Seismology Section, Royal Observatory of Belgium – Ringlaan/Avenue Circulaire, 3, B-1180 Brussels, Belgium

**At ULiege:** Unit of Physical Geography and Quaternary, University of Liege – Clos Mercator, 3, Sart Tilman, B-4000 Liege, Belgium

Contact persons: ROB: Dr. Kris Vanneste ([kris.vanneste@oma.be](mailto:kris.vanneste@oma.be), +32-2-3730280)

UGPQ: Dr. Alain Demoulin ([ademoulin@uliege.be](mailto:ademoulin@uliege.be), +32-4-3665660)

Website ROB: <http://seismologie.oma.be/en>

Website UGPQ: <http://www.geomorpho.uliege.be/index.html>