

JOB OFFER

Seismologist for a long-term contractual research position at the Royal Observatory of Belgium

The Operational Directorate (OD) “Seismology-Gravimetry” of the Royal Observatory of Belgium (ROB) is looking for an experienced seismologist to strengthen its team on the topic of the preservation and valorisation of analogue earthquake waveforms and of seismic records for climatic studies, specifically oriented towards studying the ocean microseisms and related atmosphere-ocean-solid earth couplings.

The current general research themes of the OD consist of preserving, studying and developing seismological knowledge, oriented towards the study of earthquakes and the physical properties of the Earth’s crust in Belgium and worldwide.

Recent works have shown that analogue seismic records contain a large amount of information, not only about past earthquakes but also in continuous seismic records. Through pilot publications and projects, the ROB has recently been recognised as a key player in the topic of preservation and valorisation of analogue seismograms. Our previous works prove that it is possible, thanks to computer vision or machine learning algorithms, to extract meaningful information from old seismic records sleeping in our archives. Those studies have concluded that past seismic records contain physical information about the state of the oceans - i.e. the dominant source of microseisms - and that they would allow studying it for the entire XXth century, something that was not achievable at any similar scale before the 1980s when weather satellites became more common. The ROB is co-chair of the ESC Working Group on the topic, where our contributions are internationally recognised. Strengthening the OD team on that topic will also input and support the recently created Belgian Climate Centre hosted at the Space Pole in Uccle. Moreover, the digitalisation and study of earthquake waveforms present in the Belgian archive will help improving early-instrumental European earthquake catalogues as well as current local projects, as the BELSHAKE project.

The candidate will investigate past earthquakes and past and present microseisms recorded in Belgium and around the globe by developing and applying cutting-edge machine-learning tools and modelling software. These investigations will serve to provide answers to important questions: Can we reconstruct a timeline of the state of the North Atlantic Ocean over the last century with a time resolution of a few hours or higher? What are the changes in the Ocean dynamics that can be identified in the seismic records? Is locating and tracking past major storms using multiple stations globally possible? Are there specific signatures precursor to storm surge events in the Southern North Sea? Is the Atlantic Ocean more or less energetic today than in the past?

The successful candidate is expected to take the lead on the following thematic:

- development and application of machine learning algorithms for the digitization of analogue seismic records and earthquake waveforms;
- application and development of innovative methods to locate and track oceanic storms;
- source and generation mechanisms of primary and secondary microseisms in the Atlantic Ocean and the shallow North Sea;
- comparison between satellite-based methods and seismic records;
- in addition, as a member of the staff, the candidate will be required to take part in performing routine or emergency earthquake measurements.

The candidate must have a PhD in Physics, Mathematics, Geophysics, Geology, Engineering Geology or equivalent; obtained not more than 10 years before the application. The candidate must be proficient in written and spoken English.

The following skills will be considered additional assets:

- knowledge of seismology, in particular, surface waves analyses for monitoring and imaging the crust;
- experience with data mining for data analysis;
- knowledge of French, Dutch or German;
- ability to communicate with the media and on social media;
- teaching, mentoring and outreach activities.

The candidate is expected to be part of the Seismology-Gravimetry team of the ROB, to be able to work autonomously and lead research projects and operational activities.

The candidate will carry out missions in the field, in Belgium and abroad. As such, a driving licence B is required.

How to apply:

The candidate needs to send:

- A complete CV containing publications and other achievements (see DORA: <https://sfdora.org/read/>) demonstrating past activity in the desired fields
- a motivation letter
- a plan of action including which ongoing projects he/she may bring to the ROB and which new fields he/she will cover to fulfil the requirements of this five-year position (max. 5 pages)
- at least one recommendation letter and the names of two other reference persons who could be contacted.

to Thomas.Lecocq@seismology.be and hr-as@oma.be at the latest on:

28 November 2023 at 09h00m UTC (10h00m Belgian Time).

Please note:

- incomplete applications will not be considered;
- if your Master's degree was awarded outside Belgium, the Netherlands or the Grand Duchy of Luxembourg, you will need a certificate proving the equivalence of your degree (see https://www.belgium.be/en/education/equivalence_of_diplomas) before you can be offered a contract. This equivalence is one of the necessary conditions for drawing up your contract.

What we offer:

- the position is open at level SW2 of the scientific career bracket for scientific staff of the Federal Scientific Establishments (see AR-KB¹ 2010-06-02) ;
- this position offers a contract of undetermined duration with a seed budget that will cover approximately 5 years of salary. The contract can be prolonged in case supplementary funding are obtained through the submission and award of research projects;
- flexible working hours and the possibility of teleworking

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