

POSEIDON – Improve offshore infrastructure resilience against geohazards towards a changing climate

The Doctoral Network POSEIDON funded by the European Union in the frame of the Marie-Sklódowska-Curie programme offers at the earliest possible date an

Doctoral Candidate position

Identification number: A119-24

for the duration of 36 months (in accordance with § 2 (1) WisszeitVG),

but max. until 29th February of 2028

in the area of sedimentology and geophysics particularly image analyses in the frame of the project

Micro-structural characteristics of failure planes and weak layers – new insights from (4D) μ CT measurements combined with geotechnical testing (DC5).

The selected candidate will be employed full-time as a Doctoral Candidate / Early Stage Researcher. The position is limited to a term of up to three years and funded by the European Union with a salary 100% 13 TV-L.

The Doctoral Candidate (DC) will be located and employed at MARUM at the University of Bremen (Germany). The candidate will be enrolled and become a member of the Department of Geosciences at the University of Bremen (Germany) as the purpose of the DC project is research and training leading to the successful completion of a PhD degree.

Project Description:

Submarine landslides are among the most important marine geohazards that threaten increasingly populated coastal regions and critical offshore infrastructure. Although in the focus of research, there is still a clear lack in understanding failure mechanisms, which ultimately trigger these landslides. Nowadays, the *weak layer concept*, i.e. failure planes of submarine landslides coinciding with mechanically weaker layers embedded within the slope stratigraphy, is commonly accepted. These weak layers are typically associated with material inhomogeneities, such as alternating sequences of clay with sand or highly porous fossiliferous layers. Liquefaction or particle breakage under loading (from e.g. earthquakes) along such sediment sequences can cause pore pressure fluctuations and subsequent failure. Although many studies exist, the characteristics of weak layers and the failure mechanisms that ultimately lead to failure are still poorly understood.

DC5 will focus on investigating the role of sediment composition and slope stratigraphy on the localisation of failure planes of submarine landslides. The candidate will use novel high-resolution 3D and 4D micro-Computed Tomography (μ CT) imaging data and develop new machine learning routines to investigate weak layers and failure planes of submarine landslides on a (sub-)micro-scale level. μ CT data in combination with geotechnical experiments will enable to gain a deeper understanding of effects such as particle interlocking and breakage, or variations in sediment type, e.g. contents of diatoms on failure plane formation.

We are searching for an enthusiastic and dynamic early career researcher who is interested in joining a multidisciplinary research team. Very good written and oral English language skills are required because the studies will be carried out in an international programme. The applicant is expected to visit partners from the POSEIDON consortium for extended secondments of up to approximately six months and will have to participate in joint network-wide training activities, e.g. our joint annual workshop.

Specific requirements:

- Completed academic university degree (Master's/University Diploma) in Geology, Geotechnics, Geophysics, Earth Sciences, Geoinformatics, or related fields;
- Basic knowledge of image analysing techniques, sedimentology, geotechnics or related topics;
- Outstanding drafting and presentation skills, with an eye for detail;
- Very good written and oral English skills, as the project is carried out in an international programme;
- Skills in scientific computing (preferably in Python or MATLAB), image analysis and processing, as well as in data visualisation (e.g. using MATLAB) would be advantageous.

The University of Bremen is family-friendly, diverse and sees itself as an international university. We therefore welcome all applicants regardless of gender, nationality, ethnic and social background, religion/belief, disability, age, sexual orientation and identity.

However, to be eligible for employment according to EU mobility rules, candidates must match the definition of an Doctoral Candidate. Accordingly, DC5 candidates must not have resided in Germany for more than 12 months in the three years immediately prior to recruitment. In addition, the mobility rule of the EU pinpoints that at the time of recruitment by the host organisation the DC must be a doctoral candidate i.e. not already in possession of a doctoral degree. Researchers who have successfully defended their doctoral thesis but who have not yet formally been awarded the doctoral degree will not be considered eligible.

The European Union aims at increasing the number of women in science and therefore explicitly encourages applications from female candidates.

In the case of equal personal aptitudes and qualification, priority will be given to disabled persons.

For further enquiries please contact:

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Applications should be submitted via the University of Twente online portal:
<https://utwentecareers.nl/en/vacancies/1606/13-phd-positions-on-the-eu-horizon-2020-marie-skiodowska-curie-project-poseidon/>

Documents should include a letter of motivation, a CV, the applicant's research and technical background as they relate to the position, as well as two reference letters. As the positions should be filled at the nearest possible date, the deadline for application is the **15.03.2024**.

After the successful passing of the written applications, shortlisted candidates will be invited to an interview.