With more than 46,000 students and around 4,600 employees, Johann Wolfgang Goethe University Frankfurt am Main is one of the largest universities in Germany. Founded in 1914 by Frankfurt citizens and since 2008 again in the legal form of a foundation, Goethe University possesses a high degree of independence, modernity and subject diversity. As a comprehensive university, Goethe University Frankfurt offers 100 courses of study on five campuses in a total of 16 departments and at the same time has an outstanding research strength.

The Department of Geosciences and Geography at Goethe University Frankfurt, at the Institute of Geosciences, has a vacancy for a

Postdoctoral researcher (m/f/d)
(E13 TV-G-U)

for the duration of **3 years**. The classification is based on the job characteristics of the collective agreement applicable to Goethe University (TV-G-U). Earliest starting date is **1 April 2022**; the position will remain open until filled.

The position is linked to a DFG-funded project (AU356/13) with the topic:

"Complementary insights from orogenic and xenolithic eclogites as recorders of mass transfer in subduction zones: A unique case study from the Farallon Plate".

The project aims to better understand mass transfer processes in subduction zones. To this end, natural samples (eclogites) from the Cretaceous Farallon Plate will be studied using modern petrological and (isotope) geochemical methods. The work will be carried out mainly at Goethe University, with involvement of other laboratories in Germany and abroad.

The main tasks of this position within the project are formulated as follows:

- Determination of the pressure-temperature-time path of eclogites by means of major element analysis and U-Pb dating.
- Characterization of the origin and identity of mobile phases in subduction zones by means of C-S-Li-Mg-Fe isotope analysis on whole rocks
- Identification of short-lived fluid events using in situ Li-Mg-Fe isotope analysis on garnet and clinopyroxene.

Requirements for a successful application are: a completed scientific university degree, a completed PhD in an earth system science, and proficiency in spoken and written English.

We are looking for a highly motivated, team-oriented and communicative colleague with a strong interest in geochemistry and high-temperature processes. The position will be part of a new research group at the Institute of Geosciences dealing with crust-mantle evolution and volatile cycles of the Earth's interior through time, working closely with other research groups and with the interdisciplinary Frankfurt Isotope and Element Research Center (FIERCE).

Goethe University is committed to gender equality and therefore strongly encourages women to apply. People with disabilities will be given priority in case of equal qualification.

Please send your complete application documents, including cover letter, curriculum vitae (CV), publication list, summary of research interests, and two letters of reference in a single PDF document to Dr. Sonja Aulbach (s.aulbach@em.uni-frankfurt.de) by March 15, 2022.

Abstract AU356/13

Oceanic subduction zones arguably constitute the single most important interface on Earth where significant crust-mantle interaction, with transfer of volatiles and other elements, occurs - processes that are fundamental to planetary evolution. Some mass transfer is mediated by fluids and melts as a function of composition, pressure, temperature and oxygen fugacity. The effects of these parameters on element mobility in this complex environment remain fuzzy, also owing to the incomplete geological record available for any single subduction zone. Due to a unique geological happenstance, the oceanic crust of the Cretaceous Farallon plate has been sampled over an exceptionally large pressure interval (~2.0-4.7 GPa), by tectonically exhumed eclogites in the Franciscan Complex (western United States), and by eclogite xenoliths occurring in the Navajo Volcanic Field, 700 km to the east. Using a representative sample suite, this study aims to fingerprint the sources of the fluids that interacted with the eclogites during deep mass transfer processes in the Farallon plate using bulk-rock Li-B-Mg-Fe isotopes, and detect short-lived fluid flow events with in situ Li-Mg-Fe isotopes. A pressure-temperature-time-oxygen fugacity path will be delineated by combining geothermo-oxybarometry with a novel garnet U-Pb dating tool. Coupled bulk carbon and sulphur concentrations, speciations and isotopic compositions, enhanced by sulphide $\delta^{34}S$, garnet $Fe^{3+}/\Sigma Fe$ and garnet $\delta^{56}Fe$, will be used to assess the interplay between the redox-sensitive elements Fe, C and S, and identify the reactions by which they are mobilised or retained in the slab. Combined, these data will allow to trace the physicochemical controls on mass transfer processes and volatile cycling from forearc to subarc depth, in a single slab, with unprecedented detail.