



**Universität  
Zürich** UZH



**UNIVERSITÉ  
DE GENÈVE**  
FACULTÉ DES SCIENCES  
Département de physique appliquée



**UNIVERSITÉ  
DE GENÈVE**  
FACULTY OF SCIENCE  
Department of Earth Sciences



**UNIL** | Université de Lausanne  
**Faculté des géosciences  
et de l'environnement**



**SWISS NATIONAL SCIENCE FOUNDATION**

## **6 PhD positions available in an interdisciplinary research program on climate reconstruction in the late Permian and Early Triassic (Universities of Zürich, Lausanne and Geneva, Switzerland)**

We seek applications for six PhD positions in an interdisciplinary program aimed at a quantitative-numerical, fully consistent, time-resolved, global environmental model for the high-frequency and high-amplitude climate changes at the end of the Early Triassic.

The six offered PhD projects cover the following topics:

**PhD 1 and 2 (UZH):** high resolution ammonoid (PhD1) and conodont (PhD2) sampling of sections worldwide. Taxonomy based on intraspecific variation analyses. Quantitative biochronology by means of unitary associations. Quantitative biogeographic analyses from regional to global scales and development of numerical simulations and sensitivity experiments at both scales. Relations between evolutionary turnover rates, ecological partitioning and abiotic stresses. Previous experiences with field work and intensive sampling, a good knowledge of PAST and interest in numerical modelling are all valuable assets. Both PhD students will interact closely with other PhD students of the project involved in geochemistry, geochronology and climate modelling.

**PhD 3 and 4 (UNIL):** high resolution sampling and measurements of geochemical (major and trace elements - including Hg concentrations - organic matter and carbonate content) and isotopic compositions (C-, O-, and S-isotopes as well as clumped isotopes, and radiogenic Sr-, Nd-isotopes) of samples from selected Permian-Triassic profiles. This will also include improvements for the analytical methods used for both biomineralized carbonate and phosphate, notably the clumped isotope measurements of carbonates and SIMS measurements of carbonates and phosphates. The PhD students will exchange ideas and results with the students from UZH and UNIGE to help constrain the modeling parts for a global Permian-Triassic transition period.

**PhD 5 (UNIGE):** high-precision U-Pb zircon geochronology on volcanic ashes inter-bedded with fossiliferous marine sediments, possibly high-resolution oxygen and carbon isotope analyses to establish a tight control on temporal variation in temperature and bio-productivity, as well as trace-element and Hf isotope analyses on accessory minerals from the dated ash beds. Calculation of Bayesian age-depth models. Fieldwork joint with UZH group. Previous experience performing geochemical analyses, and an affinity for careful and disciplined working in a clean-air laboratory as well as with analytical equipment would be wishful.

**PhD 6 (UNIGE):** set-up of the coupled atmosphere-ocean-sea ice model MITgcm, evaluation of its ability to simulate the Triassic-Permian climate changes, improvement of its physical parameterizations in order to include full carbon cycle and coupling with ice-sheet dynamics, analysis of its sensitivity to sea-level changes, close interaction with other PhD students within the project for constructing proper initial/boundary conditions. Experience with high-performance computing and with ocean, atmosphere or climate models is an asset.

The research team from the three universities will comprise 6 PhD students and 5 researchers in paleontology, geochemistry, geochronology, plate tectonic and climate modelling, funded by the Swiss National Foundation for Scientific Research until November 2022. The successful candidates will be integrated into a teaching program featuring different

short courses on relevant topics within the frame of this interdisciplinary research program.

We invite applicants with a MSc, Diploma, high-ranking BSc (Honors; 1st class or 2-1), and/or equivalent degree(s) in Earth Sciences, or in Physics for PhD 6. The candidates should have an aptitude for quickly learning new skills. Fluency in speaking, reading and writing scientific English is required. The project will start 1<sup>st</sup> of November, 2018. Gross salary is 47-50 kCHF per year, social charges and taxes amount to a maximum of 20 %. Candidates need to have citizenship of the European Union or AELE, or Swiss citizenship.

Applications (including a CV, a list of three referees, and a statement about motivation and career planning) should be sent as soon as possible, but before June 10, 2018, in one pdf file to the following persons:

Prof. Hugo Bucher ([Hugo.FR.Bucher@pim.uzh.ch](mailto:Hugo.FR.Bucher@pim.uzh.ch)) for PhD positions 1 and 2

Prof. Torsten Vennemann ([Torsten.Vennemann@unil.ch](mailto:Torsten.Vennemann@unil.ch)) for PhD positions 3 and 4

Prof. Urs Schaltegger ([urs.schaltegger@unige.ch](mailto:urs.schaltegger@unige.ch)) for PhD position 5

Dr. M. Brunetti ([maura.brunetti@unige.ch](mailto:maura.brunetti@unige.ch)) for PhD position 6

For further questions, do not hesitate to directly contact the four group leaders via email. Selected candidates will be invited for a one-day recruitment workshop at the end of June 2018.

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