

Postdoctoral researcher in Physical Geography with alternative research focus in Climatology, Hydrology, Geomorphology of Mass Movements, or Glacial Geomorphology.

Institution: Charles University, Faculty of Science, Department of Physical Geography and Geoecology, Prague

Duration: 1 year, starting from March 2022

Location: Prague, Czech Republic

Application deadline: 30 November

Charles University is the largest university in the Czech Republic and its Faculty of Science is among the most research-intensive units of the university and one of the main research institutions in the country. The Department of Physical Geography and Geoecology (<https://www.natur.cuni.cz/geography/physgeo>) is a medium-size department with about 18 permanent faculty members, several research fellows and postdocs, and about 40 doctoral students. More than 25% of research fellows, postdocs and doctoral students come from abroad, resulting in stimulating international environment. Research is conducted in four research groups: Climatology, Hydrology, Geomorphology, and Landscape ecology/soil science.

We are opening one postdoctoral position with the following possible research topics:

(1) Climatology with focus on solar activity and atmospheric circulation, (2) Response of mid-latitude montane catchments to climate change, (3) Glacial lake outbursts and landslides (4) Palaeoglaciation of north-eastern Eurasia.

We seek a highly motivated and competitive candidate who got their PhD outside of the Czech Republic. Candidates will be selected based on their research profile, publication record, and, for the shortlisted candidates, an interview. Candidates that have earned their PhD within the last four years will be preferred.

We offer the chance to be part of a creative, interdisciplinary team with internationally recognized results, flexi-time and mobile working, competitive salary (senior researcher pay scheme).

Description of alternative research topics:

(1) Effects of variability in solar activity on atmospheric circulation in the Northern Hemisphere

Variations in the input of solar energy into the climate system of the Earth are small; in spite of it, they have been shown to affect various aspects of atmospheric circulation, including the frequency and duration of blocking events, frequency of circulation types, and strength and spatial extent of modes of low-frequency variability (such as the North Atlantic Oscillation). The proposed research consists in extension of the previous analyses to (i) other measures of atmospheric circulation, (ii) datasets extending farther back in time (at least into the 2nd half of the 19th century), (iii) newly available datasets (e.g., surface-input reanalyses), and (iv) examination of lagged relationships (with lags from a week to several years), the overarching objective being to examine whether the relationships identified in previous research hold over longer and less recent time periods and in various datasets. The tools will be standard multivariate statistical methods (such as Principal

Component Analysis). The analysis will be conducted for atmospheric circulation in the mid troposphere, i.e., at the 500 hPa level. Publication of results is expected in high-quality international journals, such as Journal of Climate and Journal of Geophysical Research-Atmospheres.

Contact person: Radan Huth (radan.huth@natur.cuni.cz)
<https://www.natur.cuni.cz/geography/physgeo/huthr>

(2) Response of mid-latitude montane catchments to climate change

The research of the hydrological research group focuses on the hydrological processes at a catchment scale. Our research aims at understanding the changes in runoff generation and dynamics of hydrological processes in response to climate change, land-use changes, and human impact. Our research is focused on a catchment scale, dealing with flood and drought hydrology, snow hydrology, hydromorphology, water quality as well as with limnology (<http://hydro.natur.cuni.cz/>).

The announced position aims at modeling changes in the hydrological regime of mid-latitude montane catchments in response to climate change and landscape disturbance. The candidate will work within a framing wider research project. The research will employ data from long-term hydrometeorological observations, and from the own experimental automated sensor network. The research topic should cover one of the following aspects of hydrological change:

- Changes in the hydrological regime and runoff dynamics of montane peat bogs in response to the changing climate and environment.
- Changes in mountain catchment storage in response to climate change, with a focus on the modeling of the snowpack dynamics in relation to climate change, the memory effect of the catchments, water balance, and groundwater storage.
- Nature-based solutions for mitigation of hydrological extremes, with a focus on the effects of land and stream restorations on the mitigation of droughts and floods.

Contact person: Jakub Langhammer (jakub.langhammer@natur.cuni.cz)
<http://langhammer.natur.cuni.cz/>

(3) Glacial lake outbursts and landslides

The announced position will focus on natural hazards and risks (GLOFs or landslides) studied by advanced methods of remote sensing. Retreat of glaciers, resulting from climate change, can reveal overdeepenings on the glacier bed where future lakes will form. GLOFs from selected lakes will be modelled in terms of their susceptibility to outburst. Alternatively, the position can focus on landslides: shallow or deep-seated landslides as well as on related debris and/or earth flows that lead to the development of badland areas and release of sediments to the local drainage systems. GLOFs and landslides could be combined or studied separately.

Contact person: Vít Vilímek (vit.vilimek@natur.cuni.cz)
<https://www.natur.cuni.cz/geography/physgeo/vilimek>

(4) Palaeoglaciation of north-eastern Eurasia

The vast mountainous regions of north-eastern Eurasia (the continental landmass east of the Aldan-Lena rivers) hosted extensive glaciation during the Pleistocene glacial periods, which obstructed the biotic interchange between Eurasia and the Americas, possibly playing a role in the late settlement of the Americas by humans. However, the extents of these glaciations, both in terms of the local Last Glacial Maximum and the all-time Pleistocene maximum, have not yet been clearly determined,

owing to the remoteness of the region and lack of high-resolution remote sensing data. The recently available high-resolution digital elevation data make it possible to map the glacial landform record in a detail that would allow for determining the past glacial extents with some confidence.

Within the advertised position, the goal will be to map the glacial landform record of north-eastern Eurasia from high resolution data and to use the mapping results for inferences on the past extents of glaciation. The successful candidate for this position will have experience with glacial geomorphological mapping in GIS backed by publication record within this field of research. The selected candidate will work on this topic with Martin Margold (CU), Iestyn Barr (Manchester Metropolitan University) and other international collaborators.

Contact person: Martin Margold (martin.margold@natur.cuni.cz)
<https://www.natur.cuni.cz/geography/physgeo/margold>

Application procedure

Applications should be submitted via email to Martina Linhartova (martina.linhartova@natur.cuni.cz) by 30 November 2021. Please indicate "Postdoc call" in a message subject.

Applications should contain the following: (1) CV including publication record, (2) Motivation letter explaining why the candidate is suitable for the selected research topic, (3) One reference letter.

Applicants will be first shortlisted based on their applications and the shortlisted candidates will be invited for an online interview. The results will be announced in December 2021.