

At the Department of Physical Geography and Geoecology, Faculty of Science, Charles University in Prague, Czech Republic, we are offering a

PhD position in Geography / Dendroecology

for the duration of four years starting October 1, 2022. The PhD student will support our dendroecology working group within the new GAČR (Czech Science Foundation) project:

“Using forward modelling to unravel the complex climatic control on intra-annual tree growth at cold distribution margins”

Project description: Treeline ecotones at high latitudes and high elevations are generally temperature-limited environments. However, evidence is increasing that temperature control on tree growth has recently decreased at treelines due to climate change, while water availability can be a seasonally important growth-limiting factor. More studies are needed i) at intra-annual (wood cell) resolution and ii) considering multiple growth-limiting factors to better understand these complex climate-growth responses at treelines.

The PhD candidate will support the GAČR project by using 1) quantitative wood anatomy and 2) process-based models of wood formation to systematically assess climate-driven intra-annual tree growth dynamics for representative polar and alpine treeline sites in Eurasia and North America. For 1), the candidate will prepare microscopic thin sections of wood, measure xylem anatomical traits, and establish statistical relationships between xylem anatomical traits and climate. For 2), process-based models of tree growth will be calibrated and employed to simulate wood formation dynamics at daily resolution. All analyses will be based on a set of existing and newly collected samples (tree cores) from polar and alpine treeline sites in Eurasia and North America.

About us: We are a young and growing research team led by Václav Tremel. Our research is focused on forest ecology and climatic effects on tree growth at European treelines and beyond. We use various tree-ring proxies (tree-ring width, wood density/blue intensity, wood anatomy, isotopes) and other data sources (forestry databases, satellite imagery). We are particularly specialized in xylogenesis monitoring (>10 years of continuous monitoring in the Czech Krkonoše Mountains), quantitative wood anatomy, and process-based modelling of tree growth (mainly Vaganov-Shashkin model). Our dendrolab features state-of-the-art infrastructure (scanners, microtomes, microscopes, software). More info on our lab can be found at: <https://www.researchgate.net/lab/Charles-University-Lab-of-Tree-ring-Research-Vaclav-Tremel>. Our new website is under construction and will be accessible from around the end of January at: <https://web.natur.cuni.cz/physgeo/dendro>.

Your profile: You hold an M.Sc. degree (or equivalent) in Geography, Ecology, Biology, Forestry, or a related discipline. We are looking for a highly motivated candidate with strong scientific interest in dendroecology, wood anatomy/wood formation, field and laboratory work, as well as modeling/programming. Previous education and/or practical experience in these areas is a strong advantage. The ideal candidate will proactively contribute to the research project by developing own research ideas and expertise, and has an independent, team-oriented working style. The candidate should be able to participate in fieldwork in subalpine and subarctic environments and to perform microscopic lab work. The working language is English; therefore, a very good command of English is required.

Our offer: The PhD candidate will be jointly supervised by Jelena Lange and Jan Tumajer. A net salary of 25 000 CZK per month (ca. 1022 EUR) including health insurance is guaranteed for the duration of the PhD program (4 years). Additional bonuses are paid once per year. We will encourage and support the successful candidate to apply for additional funding through

the Charles University PhD student grant scheme (GAUK, <https://cuni.cz/uken-753.html>, mean university-wide success rate was 38% in 2021). Please note that the cost of living in Prague is generally lower compared to many other European cities, see: <https://www.numbeo.com/cost-of-living/comparison.jsp>

The candidate will join the international PhD program of the Department of Physical Geography and Geocology, which brings together PhD students from different sub-disciplines (incl. biogeography, landscape ecology, pedology, glaciology, geomorphology, climatology, hydrology). Amongst others, the program includes courses that help develop general scientific skills (e.g., scientific writing, presentation skills).

Contact: For further inquiries, please contact Jelena Lange (langej@natur.cuni.cz) or Jan Tumajer (jan.tumajer@natur.cuni.cz).

Application: This PhD position is supported by the STARS program of Charles University (support program for excellent PhD students). Please send your complete application including (1) a letter of motivation outlining your research interests, (2) a CV, (3) a list of publications (if applicable), and (4) the contact details of at least two academic referees, as one PDF file, through the official STARS online application system: <https://stars-natur.cz/phd-positions/geography/treelines-under-climate-change-linking-wood-anatomy-and-modelling-to-better-understand-climatic-drivers-of-wood-formation?back=hcq90>.

Applications not sent through this portal cannot be accepted.

Application deadline is March 13, 2022.