3 PhD positions at Ulm University (Germany) in plant ecophysiology, functional anatomy, and gas transport in plants

Duration: 3 years

About the positions: Within an international research team, the PhD candidate is expected to combine experimental work with microscopy and modelling to investigate transport processes in wood under different levels of drought stress [1]. Questions that will be addressed relate to fluid transport in wood under variable conditions, including living plants in the field [2], the possible link between gas entry in water conducting cells and hydraulic failure of the system [3], and the application of novel insights to evaporation-driven transport systems, which are also known as "artificial trees".

Based on the long-standing expertise at Ulm on functional plant anatomy and especially water transport in plants, the students will contribute to our understanding of drought-induced failure of water transport in plants, and how this process is (in)directly linked to productivity and resilience of growth. The projects will have implications for our understanding of plant water use and plant responses to drought, which is especially relevant given current concerns about climate change and drought-induced tree mortality.

Expected starting date: between March and April 2023 (or to be discussed)

About the candidate: we are looking for motivated PhD students with a MSc degree or equivalent. The candidates are expected to have experience with experimental lab work, a general scientific background, and be interested in plant biology. Earlier experience with plant ecophysiology, anatomy, or transport in porous media is not required, but would be a plus. Experience in working with R is also desired.

To apply, please send your CV and cover letter before 1 February 2023 to steven.jansen@uni-ulm.de

References

- [1] Yang D., Pereira P., Peng G., Ribeiro R.V., Kaack L., Jansen S., Tyree M.T. (2021) A Unit Pipe Pneumatic model to simulate gas kinetics during measurements of embolism in excised angiosperm xylem. *Tree Physiology*.
- [2] Guan X., Pereira L., McAdam S.A.M., Cao K., Jansen S. (2021) No gas source, no problem: proximity to pre-existing embolism and segmentation affect embolism spreading in angiosperm xylem by gas diffusion. *Plant, Cell & Environment* 44: 1329-1345.
- [3] Kaack L., Weber M., Isasa E., Karimi Z., Li S., Pereira L., Trabi C., Zhang Y., Schenk H.J., Schuldt B., Schmidt V., Jansen S. (2021) Pore constrictions in intervessel pit membranes provide a mechanistic explanation for xylem embolism resistance in angiosperms. *New Phytologist* 230:1829-1843.