The Max Planck Institute for Biogeochemistry (MPI-BGC) in Jena is dedicated to interdisciplinary basic research in the field of Earth System Sciences with a focus on climate and ecosystems. The internationally renowned institute, which currently employs around 230 people, will celebrate its 25th anniversary in 2022. Jena is known for its high-tech industry, internationally renowned research facilities and a modern university. But it also has a beautiful natural setting in the green Saale valley with steep limestone slopes. The city of Jena has an active student scene and a diverse cultural life. For the research group Plant Allocation we are looking for a

**PhD position in tree ecophysiology (m/f/d)**
(full-time, limited to three years)

**Background and position description:**

Trees are the dominant plant component of forest ecosystems. They have evolved over millions of years and have been able to survive changes in environmental conditions at geological time scales. Recent changes in climate from human greenhouse gas emissions, in particular drought and elevated temperatures, bring trees to their acclimatory limits and this has created a dangerous interplay between physiological stress from drought/heat and ecological pressure from antagonistic organisms like bark boring insects. As a result, millions of hectares of forest have been destroyed by bark beetles in North America and also in Europe during the last decades.

A particular focus of our research is on the linkage between tree primary and secondary metabolism, i.e. the carbon balance and chemical defenses. The current understanding is that carbon availability from photosynthesis decreases during physiological stress and the resulting lack of resources also reduces the production of tree defense compounds. During stressful environmental conditions like drought and heat waves, rapidly growing insect populations encounter less well-defended trees and can more easily develop in their hosts, leading to epidemic outbreaks and large-scale tree mortality. Despite our good conceptual understanding of tree-insect interactions, we currently lack an empirical backbone to quantify impacts of drought/heat and tree carbon and defense metabolism and this prevents realistic forecasting of tree survival under ongoing climate change.

The PhD position is nested within the larger DFG-funded project “Tree defense in a changing world” and addresses the first of three work packages that aims to empirically establish responses of tree primary (non-structural carbohydrates) and secondary metabolism (phenolic compounds like tannins) to drought. The workpackage builds upon a large international network of collaborators who have carried out experimental drought manipulations in forest ecosystems and who provide sample material for chemical analysis. Analyses will be carried out in collaboration with the department of Biochemistry (Prof. Jonathan Gershenzon) of the Max-Planck Institute of Chemical Ecology and will use modern analytical platforms like HPAE-PAD and UPLC TQ-MS/MS. Results from this workpackage feed into a vegetation model to improve predictions of tree-insect interactions under climate change. The latter will be carried out in collaboration with the chair for Ecosystem Dynamics and Forest Management in Mountain Landscapes of the Technical University Munich (Prof. Rupert Seidl).
Your Tasks:
- organize and coordinate collaboration within a network of international partners
- interact and coordinate with institutional analytics group and collaborators of the MPI Chemical Ecology to conduct sample analysis for primary and secondary metabolites
- lead and contribute to publications in international scientific journals and represent the research group in national and international meetings

Your Profile:
- Master’s degree in biology, plant (eco)physiology, chemical ecology, biochemistry or similar
- sound understanding/interest of tree/plant carbon metabolism and, ideally, also secondary metabolism
- very good (wet chemistry) analytical skills
- demonstrated ability/will to write publications in scientific journals in the field of plant sciences
- very good communication and organizational skills
- very good knowledge of English

Our offer:

The successful applicant will become part of an internationally anchored renowned research environment that spans experimental and theoretical approaches in investigations of global biogeochemical cycles. The research group plant allocation is settled within the department of Biogeochemical Processes which provides opportunities for collaboration with scientists working on neighboring topics. The group has established itself as one of the key players in research on plant carbon allocation and has strong ties to internationally renowned labs across the globe. The close ties with the Max Planck Institute for Chemical Ecology also offers many synergistic opportunities. In addition, Dr. Henrik Hartmann is the coordinator of the IUFRO task force on monitoring of global tree mortality patterns and trends and founding core team member of the International Tree Mortality Network.

The conditions of employment, including upgrades and duration follow the rules of the Max Planck Society for the Advancement of Sciences and those of the German civil service. The Max Planck Society strives for equality between women and men and for diversity. In addition, the Max Planck Society wants to increase the proportion of women in those areas in which they are underrepresented. Women therefore encourage international applications and, in particular, applications from women. We welcome applications from all areas.

The Max Planck Society has set itself the goal of employing more severely disabled people. Applications from severely disabled persons are expressly welcome.

Your application:

Please send your inquiries and/or applications including a letter of interest, CV, and the names and contact information of two references to Dr. Henrik Hartmann (hhart@bgc-jena.mpg.de), or directly to the institute’s address:

Max-Planck-Institut für Biogeochemie
Herr Dr. Henrik Hartmann
Hans-Knöll-Straße 10
07745 Jena

Review of applications will begin at the end of October. Web-based interviews are foreseen to take place in early November 2020. The position will be filled at the earliest convenience, ideally no later than January 1st 2021.

We are looking forward to your application!