7 PhD positions (m/f/d) and 1 Postdoc position (m/f/d) in forest biodiversity-ecosystem functioning (BEF) research - a beta-diversity experiment (BETA-FOR)

Julius-Maximilians University Würzburg (JMU) and its partner Universities Georg-August-University of Göttingen (GAUG), Leipzig University (UL), University of Bayreuth (UB), University of Freiburg (UF), Technische Universität Dresden (TUD), Leuphana University Lüneburg (LUL), Goethe-University Frankfurt (GUF), Technical University Munich (TUM), German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, in cooperation with the Bavarian Forest Nationalpark, are starting a research collaboration for investigating the effects of enhancing the structural diversity between forest patches by silvicultural interventions, e.g., tree cutting, to improve biodiversity and ecosystem functioning.

BETA-FOR offers seven positions for doctoral researchers (m/f/d), and one for a postdoctoral researcher (m/f/d), addressing various aspects of structures, functions and biodiversity in experimentally manipulated forest patches. The study sites are located mainly in the University Forest of Würzburg and the Bavarian Forest Nationalpark, with additional sites in Lübeck, Hunsrück-Hochwald Nationalpark and the Saarland. The team of supervisors is highly interdisciplinary ranging from ecology to forest science and to remote sensing, with research foci related to biodiversity and ecosystem processes in below- and above-ground systems, along multiple trophic levels. We have a strong focus on statistical models of α-, β- and γ-diversity and multifunctionality. We will stimulate diverse cooperation within the research unit and with other internationally leading experts of the field.
Within the Research Unit BETA-FOR we offer the following subproject (SP) positions

(pending final approval):

Starting date: 01 May, 2022

Postdoctoral Researcher
1 position

SP1: Forest structure and microclimate
PIs: Prof. Dr. Christian Ammer, Prof. Dr. Dominik Seidel, Göttingen, Prof. Dr. Bernhard Schuldt, Würzburg

Doctoral Researcher
7 positions

SP4: Soil biodiversity and functioning
PIs: Dr. Simone Cesarz, Prof. Dr. Nico Eisenhauer, Leipzig

SP5: After life - decomposition
PIs: Prof. Dr. Michael Scherer-Lorenzen, Freiburg, Prof. Dr. Marcell K. Peters, Würzburg

SP6: Plant-animal interactions - pollination, parasitism, and seed dispersal
PIs: Prof. Dr. Heike Feldhaar, Bayreuth, Prof. Dr. Ingolf Steffan-Dewenter, Dr. Alice Classen, Würzburg

SP7: Effects of enhanced structural complexity on dead-wood microbial diversity and wood decomposition
PIs: Prof. Dr. Claus Bässler, Frankfurt am Main

SP8: Understorey plant assemblages and primary production
PIs: Prof. Dr. Goddert von Oheimb, Dresden, Assoc. Prof. Dr. Andreas Fichtner, Lüneburg

SP9: Multifunctionality and the biodiversity of higher trophic levels
PIs: Prof. Dr. Jörg Müller, Würzburg, Assoc. Prof. Dr. Simon Thorn, Würzburg, Prof. Dr. Wolfgang Weisser, München
We offer:

- Cutting-edge research projects in a real-world forest diversity experiment
- Outstanding, interdisciplinary and integrative research environment, offering many networking opportunities
- Individual supervision by internationally recognized scientists in BEF and forest biodiversity research

Requirements/expected profile:

- Excellent M.Sc. degree in a project-related field (e.g. ecology, forest science, remote sensing, environmental sciences)
- Very good ecological knowledge and great interest with regard to forest biodiversity/functioning research
- Good quantitative and statistical skills in R
- Excellent communication skills in English - writing and speaking.
- Motivated to be a proactive team player in an international, interdisciplinary research consortium
- Field work experience in forests would be advantageous
- Driving license is a must; partly also a private car, if the company car is not available. (Reimbursements for private KM costs will be paid.)

Application deadline: 22 March 2022

Please submit your application as one single pdf-file including:

- Cover letter in English describing your motivation for the respective subproject (see below), research interests and relevant experience
- Curriculum vitae in tabular form
- Digital copy of the master`s certificate and transcript of records or equivalent
- Names and contact details of at least two scientific references
- Working email address

Please submit your application for BETA-FOR positions only in English and via the contact addresses given below in the description of the subproject. It is possible to apply for several positions but with tailored motivation letters. All universities of this consortium are equal opportunities employer and place emphasis on fostering career opportunities for women. Qualified female applicants are therefore strongly encouraged to apply. Our universities intend to raise the number of disabled persons in their employment. In the case of equally qualified applicants, disabled persons will be preferentially considered.

Preselected candidates will be invited to online recruitments taking place end of March/beginning of April 2022. Queries concerning the application process should be directed to the respective project leader; for consortium-related questions, please contact joerg.mueller@uni-wuerzburg.de.
Numerous studies have found negative or positive effects of forest management on biodiversity, but a causal explanation for these contradicting results is lacking. One reason might be that relationships between forest structure, the microclimate and its effect on biodiversity has poorly been studied in the past because of the difficulty to describe the three-dimensional (3D) structure of a forest stand. The novel laser scanning technique is able to fill this gap by deriving quantitative, 3D data on forest structure and its complexity at high resolution. This is particularly promising because all animals live in a 3D physical habitat, which is directly tied to the microclimate. In this context, it is important to investigate the effects of different forest management practices, as well as interventions to increase heterogeneity between stands, on local microclimate and its effects on biodiversity.

This project will quantify (i) the structural changes caused by management interventions to increase the structural complexity of forests, (ii) which microclimatic properties are affected by these changes, (iii) how structural complexity of forest stands changes over time including the role of forest regeneration development, and (iv) whether recently developed indices of structural complexity can be used as proxies for changes in microclimatic conditions.

We focus on the relationship between structural complexity and microclimate for mechanistically understanding the relationship between forest structure heterogeneity and biodiversity. In addition to these tasks, the post-doc working in this subproject will provide silvicultural conclusions for forestry practice and the transfer of knowledge to forest management in close cooperation with the synthesis post-doc, who mainly works on an analytical basis.

Here, we offer a four-year post-doc position (m/f/d), 100 %, TV-L, in the Department of Spatial Structures and Digitization of Forest at the Faculty of Forest Science and Forest Ecology at the Georg-August-University, Göttingen. We are looking for candidates with deeper interest in both, 3D laser scanning and 3D measurements of the microclimatic conditions. In addition, we seek a candidate who is familiar with forest management approaches and analytical skills. You should enjoy field work, analyzing the 3D data and transferring results into practice, a driving license is a prerequisite. A Master's degree in geography, biology, forestry or closely related subjects is a prerequisite for employment. You should possess a solid track record of publications and an excellent PhD. We offer you a pleasant working environment in Göttingen, team spirit and great support by the team (Prof. Dominik Seidel, Prof. Bernhard Schuldt, Prof. Christian Ammer) and a unique dataset to work with.

For further information, please contact Prof. Dr. Dominik Seidel, e-mail: dseidel@gwdg.de , telephone: +49 551 3923680; HR department: Benedikt Juch, E-Mail: benedikt.juch@uni-goettingen.de , Tel. +495513923371

Please submit your application exclusively via the application portal http://obp.uni-goettingen.de/de-de/OBF/Index/71534.
SP4: Soil biodiversity and functioning

PIs: Dr. Simone Cesarz, Prof. Dr. Nico Eisenhauer, Leipzig

Multifunctionality is an important feature of landscapes, but we lack a mechanistic understanding explaining it and, therefore, to protect it. This understanding can be improved when integrating soil biodiversity and functioning, since soil organisms are the backbone of terrestrial ecosystems providing main functions. In this subproject, we want to investigate how changes in forest structural complexity and microclimatic conditions affect belowground biodiversity (free-living soil nematodes) and functions (e.g., soil respiration, soil microbial biomass, water-stable-soil aggregates, enzymes, and decomposition). We aim at considering the spatial scaling of these relationships by assessing driving factors of taxonomic and functional diversity as well as of belowground multifunctionality at the α-, β, and γ-scale.

This project has a strong focus on free-living soil nematodes with the aim to combine both, morphological and molecular analyses. Prior knowledge of morphological and/or molecular analysis is an advantage, but is not a must. The candidate will learn a variety of different laboratory methods (substrate-induced-respiration, PLFA analysis, soil animal extraction, soil physical measurements) to answer the research questions from a belowground perspective. Generally, we welcome any further knowledge in belowground organisms and techniques and are happy to implement them in the working packages.

We are looking for a motivated, pro-active candidate with an interest in testing ecological theories in the field. That means that we expect a certain degree of independence but with openness for teamwork, and the urge to translate the gained knowledge into scientific publications. We offer intensive and individual exchange with the supervisors and the entire working group. A driver’s license is required, but no car.

We offer a four-year TV-L 65 % contract, excellent working conditions, new laboratory facilities, and an enormous potential for networking. The doctoral student will work in a highly international team at the German Centre of Integrative Biodiversity Research (iDiv) Jena-Halle-Leipzig. The Centre is located in the city of Leipzig and is a joint institute of MLU, FSU, UL, and the Helmholtz Centre for Environmental Research (UFZ). The concept of iDiv encompasses the detection of biodiversity, understanding its emergence, exploring its consequences for ecosystem functions and services, and developing strategies to safeguard biodiversity under global change.

Please submit your application only in English and via our application portal under apply.idiv.de. Please note that our official application portal may not be open yet. In that case, we ask you to inform Svenja Haenzel (Svenja.Haenzel@idiv.de) - after the portal has opened, she will then contact you and ask you to upload your application.
The largest part of plant and animal biomass produced in forests enters the soil compartment, and returns into nutrient cycles as dead organic matter, which is decomposed by bacteria, fungi, arthropods and other soil organisms. The structure of the forest canopy affects light, temperature and moisture conditions at ground level, and the quantity and quality of litter and dead wood produced, which thus determines decomposer biodiversity, rates of decomposition and nutrient cycling. Therefore, changes in forest management practices that alter the forest canopy can largely affect decomposers, decomposition processes and nutrient fluxes.

This project will quantify the diversity and composition of macrodetritivore communities, decomposition rates of eleven types of plant and animal-derived organic material differing in CN ratio, and will use tracer experiments to quantify nutrient fluxes from dead organic matter to plants. We aim at a mechanistic understanding of the effects of the Enhancement of Structural Complexity Management on the decomposition system at the patch (alpha), between-patch (beta) and forest district (gamma) level.

We are looking for candidates with a deep interest for insect ecology and ecosystem functioning research. We offer a four-year TV-L 65 % contract, excellent working conditions, and an inspiring atmosphere at the Universities of Freiburg and Würzburg.

Please submit your application to sekretariat.geobotanik@biologie.uni-freiburg.de. For questions about the sub-project, please contact Michael Scherer-Lorenzen (michael.scherer@biologie.uni-freiburg.de) or Marcell Peters (marcell.peters@uni-wuerzburg.de).
**SP6: Plant-animal-antagonist interactions - pollination, seed dispersal, and parasitism**

PIs: Prof. Dr. Heike Feldhaar, Bayreuth; Dr. Alice Classen, Prof. Dr. Ingolf-Steppan-Dewenter, Würzburg

Plant recruitment of understory plants and deciduous tree species largely depends on animal mediated processes such as pollination or seed-dispersal. In this subproject we aim to understand the impact of forest management on the diversity and composition of seed dispersers and pollinators, on their interactions with plants and higher trophic levels, and on related ecosystem functions, such as seed removal rates, pollination, and parasitism.

We will quantify the taxonomic, functional and phylogenetic diversity of invertebrate (ants and gastropods) and vertebrate seed-dispersers as well as insect pollinators and their natural enemies using standard traps. Seed removal rate will be quantified experimentally and monitored using camera traps. Plant-pollinator interaction networks will be assessed based on direct observations and metabarcoding of pollen samples from the body surface of pollinators. Pollination limitation and seed set will be measured by experimental pollinator exclusion and supplementary pollination. Parasitism rates of trap-nesting bees and wasps will be monitored to establish tritrophic interaction networks and reveal the relative importance of bottom-up food and nesting resource limitation versus top-down control by natural antagonists.

We are looking for candidates with a deep interest for plant-animal interactions, insect ecology and ecosystem functioning research. We offer two three-year TV-L 65% positions (with possible extension by one year), one focusing on seed dispersal (at Bayreuth) and the other on pollination and multitrophic interaction networks of bees and wasps (at Würzburg).

Applicants should have a keen interest in ecological interactions, appreciate intensive field work in the forest, and have a good basic understanding of statistics. We offer excellent working conditions, and an inspiring atmosphere in the research teams at the Universities of Bayreuth and Würzburg (https://www.biozentrum.uni-wuerzburg.de/zoo3/startseite/).

Please submit your application to Heike Feldhaar (feldhaar@uni-bayreuth.de), Ingolf Steffan-Dewenter (ingolf.steffan@uni-wuerzburg.de), and Alice Classen (alice.classen@uni-wuerzburg.de). You are welcome to contact us for questions on the project.
SP7: Effects of enhanced structural complexity on dead-wood microbial diversity and wood decomposition

PIs: Prof. Dr. Claus Bässler, Frankfurt am Main

Wood-inhabiting fungi and bacteria are among the most divers organisms in forest ecosystems. Furthermore, they play a pivotal role for the functioning of forest ecosystem due to their capability to break down organic matter. Despite their importance, surprisingly less is known about the effects of forest management on microbial diversity and subsequent decomposition processes. In this subproject, we will use a broad set of methods to quantify wood-inhabiting fungi and bacteria communities and decomposition processes. We will use particularly molecular methods to determine microbial communities but also fruit body inventories. We will sample exposed standardized dead wood and dead wood objects available due to the forest management treatments. We aim to deepen our mechanistic understanding about the effects of the Enhancement of Structural Complexity Management on the microbial diversity and decomposition processes at the patch (alpha), between-patch (beta) and forest district (gamma) level.

We are looking for a candidate with a deep interest for fungal and microbial ecology. We offer a three-year TV-L 65 % contract, excellent working conditions, and an inspiring atmosphere at the Goethe-University of Frankfurt.

Please submit your application to L.fleckenstein@bio.uni-frankfurt.de. For questions about the sub-project, please contact Claus Bässler (baessler@bio.uni-frankfurt.de).
SP8: Understorey plant assemblages and primary production

PIs: Prof. Dr. Goddert von Oheimb, Dresden, Assoc. Prof. Dr. Andreas Fichtner, Lüneburg

Understorey plant communities are a major component of temperate forest plant diversity. However, we currently lack a mechanistic understanding on how stand structural complexity affects trait variation within understorey plant communities across spatial scales, in particular from a whole-plant perspective. The main objective of this subproject is to investigate to which extent a higher structural complexity of temperate forests alters the taxonomic and functional β-diversity of non-tree vascular plants, terricolous bryophytes and lichens in the understorey. Additionally, we explore the links between environmental heterogeneity, biodiversity and understorey above- and belowground productivity. Moreover, the subproject aims at assessing the effects of structural complexity on diversity pattern and community assembly processes of wood-dependent bryophytes and lichens, both at the stand and landscape scale.

The doctoral researcher will focus on vegetation surveys, measurements of functional traits (e.g. leaf and root traits) and plant biomass by using a variety of different methods. This will enable the candidate to deepen the understanding on plant community responses to changes in environmental conditions induced by forest management, both from an above- and belowground perspective. We are looking for candidates with a deep interest for vegetation ecology and ecosystem functioning research. Applicants should have a very good knowledge in species identification (at least of vascular plants) and a high enthusiasm for field work. A sound knowledge of ecological data analyzing is advantageous. We offer a four-year TV-L 65% contract, excellent working conditions, and an inspiring atmosphere at the Universities of Dresden and Lüneburg.

Please submit your application to sekretariat.biodiversitaet@tu-dresden.de. For questions about the subproject, please contact Goddert von Oheimb (Goddert_v_Oheimb@tu-dresden.de) or Andreas Fichtner (fichtner@leuphana.de).
Higher trophic levels can have important influences on ecosystem processes. However, they are broadly neglected in biodiversity-ecosystem function research. In this subproject, we will make use of newly available methods for standardized assessments of biodiversity in taxa of higher trophic levels. We will use a set of trapping and sampling systems for arthropods, combined with conventional and metabarcoding techniques for identification. For vertebrates we will use sound recorders for bats and birds with autonomous species identification, camera trapping for mammals and new insect dummies to measure predation pressure. Furthermore, we will assess functional-phylogenetic distances between species for taxonomical groups of higher trophic level. Additionally, we will calculate multidiversity based on few major and rapidly available functions in the research unit. This allows to test a number of hypotheses for higher trophic level BEF relationships at the $\alpha$ and $\beta$-scale.

We are looking for candidates with deeper interest and knowledge of at least one species group of higher trophic levels. We offer a four-year TV-L 65 % contract, excellent working conditions, and an inspiring atmosphere at the Fieldstation Fabrikschleichach or at the Bavarian Forest Nationalpark.

Please submit your application to station@biozentrum.uni-wuerzburg.de. For questions about the sub-project, please contact Jörg Müller (joerg.mueller@uni-wuerzburg.de).