

2 MSc projects and 2 HiWi positions in iDiv Ecotron experiment

We offer **2 MSc projects (2021/2022)** together with **2 HiWi (student helper) positions** (initially 15 h / week, 6 months, ideally **starting in April**) as part of an iDiv Ecotron experiment investigating joint effects of **climate** and **predation** on **above-belowground forest ecosystems**. Ideally, candidates will support the experiment as student helpers (HiWi) and adopt one of the advertised thesis projects for their MSc. Details below – **please share widely**. **If interested, please get in touch as soon as possible.**

Background

Human societies depend on the stable provisioning of ecosystem services. Unfortunately, the stable delivery of such services is threatened by intensifying global-change drivers, such as climate change, or the direct exploitation of natural resources. As a result, we see changing climate and biodiversity patterns across the globe. The consequences of these changes for natural and managed ecosystems are complex and need to be studied comprehensively. Forests are amongst the most threatened and most diverse ecosystem types delivering important ecosystem services and hosting a large fraction of global biodiversity. The complex interplay of multiple organism groups with their biotic and abiotic environment is key to the overall functioning and efficiency of decomposition and many other processes carried out by forest ecosystems. Through rising temperatures and altered precipitation patterns, future climate heavily impacts levels of ecological organization from individuals to communities. Previous research has shown that the effects of warming and predation on food webs and ecosystem functions depend on the predators' vertical habitat domain, their relative body size, and predator-prey body size ratios. Experiments studying the mechanisms behind ecosystem processes and their sensitivity to global change are often confined to very small spatial and temporal scales, to small subsets of natural communities, to single global-change drivers, or to either the above- or belowground compartment. Consequently, there is an urgent need for more-realistic experimental research to study the impact of global-change drivers on forest ecosystem processes. We aim to answer the question how **simultaneous climate change and predator-community manipulation** will jointly **impact experimental forest litter and soil-invertebrate communities** and their **ability to control ecosystem processes**. To answer these questions, we will run an **iDiv Ecotron** (https://www.idiv.de/en/research/platforms_and_networks/idiv_ecotron.html) experiment (**Fig. 1**). Our experiment will run for about 6 months starting in spring 2021 and will cross an invertebrate-predator and a climate-change treatment.

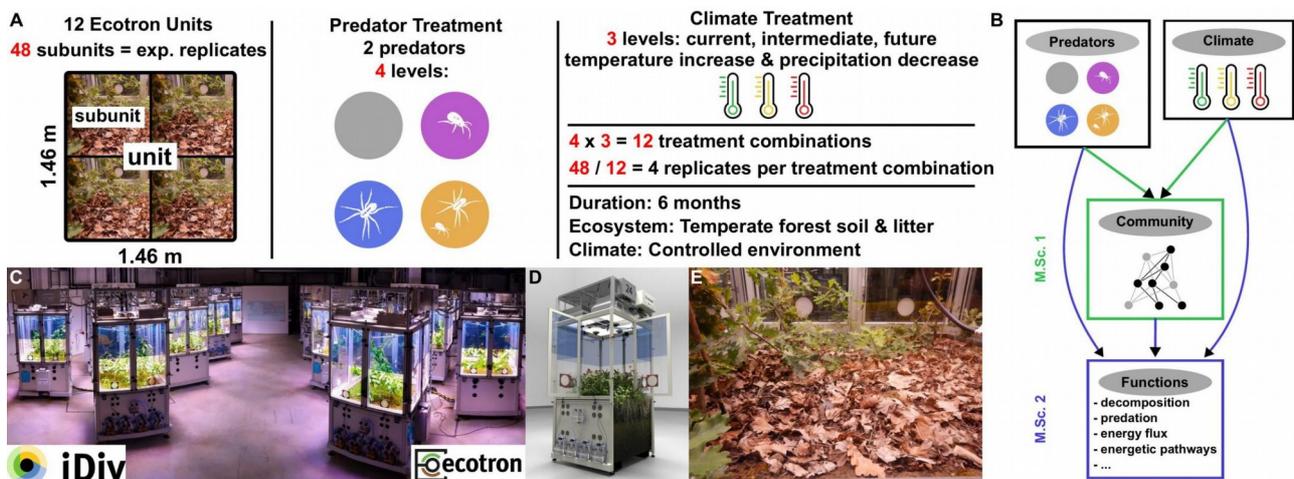


Figure 1. Overview over the iDiv Ecotron experiment. Experimental design (A) including the predator and climate treatments, the 12 treatment combinations and replication, as well as duration, ecosystem type, and climate control setup. Panel B illustrates expected pathways of treatment impacts on the ecological community (green) and ecosystem functions (blue), the two foci of the core MSc projects. Other panels show the Ecotron hall in Bad Lauchstädt, Germany (C), a technical drawing of an Ecotron unit (D), and an in-situ view from a previous Ecotron experiment in a forest-litter environment (E), respectively.

MSc thesis projects

1.) MSc 1 will focus on treatment (climate and predator community) effects on **invertebrate community structure** i.e. the relative importance of different species and functional groups, their vertical stratification, and the **trophic interaction network** (green arrows and box in Fig. 1B).

2.) MSc 2 will focus on the effect of treatments and changing faunal communities on **ecosystem functions** (decomposition, predation), **energy flux**, and **energetic pathways** (blue arrows and box in Fig. 1B).

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Both theses depend on the final sampling of the Ecotron experiment and can thus only be finalized in 2022.
→ Depending on the abilities and interests of the candidates, the exact topics can be further discussed.

What we offer and what we expect

We offer research training and education in a diverse, welcoming, and motivated team, supervision by experienced and highly-motivated researchers at a unique research centre and the possibility to work on exciting questions with state-of-the-art ecological and statistical methods. The Ecotron experiment will enable students to learn many different lab and experimental methods and interact with a diverse team of staff (Experimental Interaction Ecology group, iDiv Ecotron) and collaborators. Students will learn how to plan, run, and sample a large-scale experiment, how to analyze the resulting data, write their theses, and present their research to others.

We expect students to be interested in global change, biodiversity, community ecology, and ecosystem functioning. The ability and willingness to work both in a team and independently are absolutely necessary. For both thesis projects, skills in the statistical software R, and the willingness to extend these skills, are required. Interest in publishing thesis results (paper writing) afterwards is a plus.

HiWi positions

We offer **2 HiWi** (student helper) positions (**15 h / week, 6 months, starting in April**). Ideally, students will start helping with the experiment as student helpers (HiWi) and adopt one of the proposed thesis projects for their MSc. Work will take place **in Leipzig and Bad Lauchstädt** (iDiv Ecotron). It will comprise many different aspects including but not limited to: handling and rearing invertebrates, helping with experimental setup and maintenance, regular sampling campaigns during the experiment, problem solving, lab work to prepare and process sampling and measurement campaigns.

It will be necessary to **regularly go to Bad Lauchstädt** for maintenance and sampling trips. Ideally, transport between iDiv and Bad Lauchstädt can be centrally organized using iDiv cars, but, given the current pandemic situation, this might change.

The HiWi positions might be extended beyond the initial 6 months.

Contact

The thesis projects will be co-supervised by **Dr. Malte Jochum** (malte.jochum@idiv.de) and **Prof. Dr. Nico Eisenhauer** (nico.eisenhauer@idiv.de). Student helpers will be supervised by Malte Jochum. Please **contact Malte Jochum as soon as possible** if you are interested to further discuss the options.