BayCEER Kolloquium

Lectures in Ecology and Environmental Research

WS 2019/20

UNIVERSITÄT BAYREUTH

Donnerstag/Thursday
17.10.2019
12:00 in H6, GEO

Dr. Robert Koller

IBG-2 (Plant Sciences),
Forschungszentrum Jülich

The dark side of plants: Monitoring spatio-temporal dynamics of roots by non-invasive technologies

Individual plants vary in their ability to respond to environmental changes. The plastic response of a plant enhances its ability to avoid environmental constraints, and hence supports growth and reproduction, and evolutionary and agricultural success.

Due to the opaque nature of soil, a direct observation of belowground processes is not possible. Major progress in the analysis of belowground processes on individual plants has been made by the application of non-invasive imaging methods including Magnetic Resonance Imaging (MRI) and Positron Emission Tomography (PET).

MRI allows for repetitive measurements of roots growing in soil and facilitates quantification of root system architecture traits. PET, on the other hand, opens a door to analyze dynamic physiological processes in plants such as long-distance carbon transport in an also repeatable manner. Combining MRI with PET enables monitoring of carbon tracer allocation along the transport paths (e.g. roots visualized by MRI) into active sink structures such as nodules.

We will highlight our approaches for gathering quantitative data from both image-based technologies. In particular the combination of MRI and PET has high potential for gaining deeper insights into dynamics of root growth and, for example, interactions with microbes for revealing novel traits demanded in breeding programs for future crops.

Bayreuth Center of Ecology and Environmental Research

Bayceer

The lectures are an inter-disciplinary platform for students, junior and senior scientists. Abstracts and further information: www.bayceer.uni-bayreuth.de/kolloquium/