

# Lysimeter - Sap Flow - IoT Workshop

Munich/Freising | 18<sup>th</sup> - 20<sup>th</sup> March 2020

UGT & ICT International have been working closely together for many years to bring best monitoring technologies to scientists and managers of agriculture and the natural environment. This to enable a better understanding of water and water fluxes in the soil-plant-atmosphere continuum. These topics grows in importance as the with population pressure and climate change understanding and management of water becomes ever more critical.

Lysimeters are a proven tool for ecosystem studies. They are the reference system for matter and energy fluxes in rather undisturbed systems. Big enough to provide a root space for representative plant stands, they measure precise and detailed enough to describe fluxes at high resolution. Pesticide leaching, and greenhouse gas emissions can be quantified for the well defined lysimeter volume.

## IoT Monitoring Solutions for the soil-plant-atmosphere continuum.

ICT International manufactures instrumentation which is key to measuring the soil-plant-atmosphere continuum, enabling in-situ real time measurement of sap flow (SFM1) and plant water potential (PSY1) in absolute terms. ICT International products are specifically designed to be deployed in rugged field environments, use low-power, have wireless and internet connection. These instruments have been installed around the world - from the Amazon rainforests to the Canadian Permafrost.

In 2019 ICT International released a suite of integrated IoT enabled sensing solutions designed specifically to measure the soil-plant-atmosphere continuum. IoT monitoring systems offer new opportunities for monitoring and management in many diverse applications such as ecophysiology research, commercial orchard production and lysimeters.

This workshop will provide an overview of these new technologies and training in their use. Also future monitoring and management opportunities from IoT technologies.

### Registration and workshop fee:

With registration the fee is 225 € for full registration and 150 € for students.  
The workshop fee includes lunches, coffee and cake and the participation of the Bavarian evening.

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## Scientific lectures

- Ann-Sophie Heldele, **Bavarian Environment Agency, Germany** - Lysimeterstudy on transport and degradation behaviour of polyfluoroalkyl substances
- Ben Umali, **ICT International, Australia** - Applications in monitoring plant water status using sap flow and water potential
- Christian Heerdt, **UGT, Germany** - Special applications at lysimeter research
- Christina Siebe, **UNAM, Mexico City, Mexico** - Soil processes affected by irrigation with either treated or untreated wastewater irrigation: a lysimeter experiment in Mexico
- Esther Singer, **EcoPOD Science Program Lead in Environmental Genomics and Systems Biology, Berkeley, USA** - Improving bioenergy yield under drought stress from field to lab
- George Kowalchuk, **Utrecht University, Netherlands** - Ecological studies toward future sustainable agroecosystems
- Johannes Haus, **Weihenstephan-Triesdorf University of Applied Sciences, Germany** - Influences of green roofs - a comparison to conventional roofs
- Mirco Migliavacca, **Max Planck Institute for Biogeochemistry, Germany** - Analyzing ecosystem functional responses by combining eddy covariance, lysimeters, sap flow and fied spectroscopy: the MANIP experiment
- Roman Zweifel, **Zweifel Consulting, Switzerland** - Dual-point-dendrometer - tracking growth, water status, and osmotic processes in trees
- Sinikka Paulus, **Max Planck Institute for Biogeochemistry, Germany** - Flux estimates at the dry side of the water cycle - observations from lysimeter stations in a Mediterranean ecosystem
- Sam Fisher, **ICT International, Australia** - IoT systems for Soil, Plant and Environmental Monitoring
- Sascha Reth, **UGT, Germany** - Lysimeter and Ecotrons - Overview and case studies
- Stefan Engelhardt, **UGT, Germany** - Lysimeters - Lower Boundary and soil monolith excavation
- Stephan Raspe, **Bavarian State Institute of Forestry, Germany** - Concept of a Combined Hydrological and Tree Physiological Monitoring at Core Level II Plots in Bavaria
- William Bruce, **ICT International, Australia** - Configuring IoT Nodes and Networks

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