

Lysimeter - Sap Flow - IoT Workshop

Munich/Freising | 18th - 20th 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 (75 € / 50 € for one day). The workshop fee includes lunches, coffee and cake and the participation of the Bavarian evening.

Umwelt-Geräte-Technik GmbH
Branch South
Weißenstephaner Berg 4
D-85354 Freising-Weißenstephan
phone: +49 (0) 8161 - 2346441
e-mail: info-sued@ugt-online.de
www.ugt-online.de



A Cooperation of UGT and ICT International



A Cooperation of UGT and ICT International

Program

Wednesday, March 18th

- 09:00 - 10:00 REGISTRATION
- 10:00 WELCOME AND INTRODUCTION - Sascha Reth, UGT, Germany
- 10:15 **LYSIMETER AND ECOTRONS - OVERVIEW AND CASE STUDIES**
Sascha Reth, UGT, Germany
- 11:00 coffee break
- 11:30 **LYSIMETERS - LOWER BOUNDARY AND SOIL MONOLITH EXCAVATION**
Stefan Engelhardt, UGT, Germany
- 12:15 **SPECIAL APPLICATIONS AT LYSIMETER RESEARCH** - Christian Heerdt, UGT, Germany
- 13:00 Lunch
- 14:00 **DUAL-POINT-DENDROMETER - TRACKING GROWTH, WATER STATUS, AND OSMOTIC PROCESSES IN TREES** - Roman Zweifel, Zweifel Consulting, Switzerland
- 14:45 **DEMONSTRATION OF UNDISTURBED EXCAVATION OF MONOLITHS AND READY-TO-GO INSTALLATION**
- 16:30 **JOINT TOUR: THE NEW ECOLAB AND MODERN LAB LYSIMETER**
- 17:30 Group discussion
- 20:00 Bavarian Evening

Thursday, March 19th

- 09:00 **INFLUENCES OF GREEN ROOFS - A COMPARISON TO CONVENTIONAL ROOFS**
Johannes Haus, Weißenstephan-Triesdorf University of Applied Sciences, Germany
- 9:30 **FLUX ESTIMATES AT THE DRY SIDE OF THE WATER CYCLE - OBSERVATIONS FROM LYSIMETER STATIONS IN A MEDITERRANEAN ECOSYSTEM**
Sinikka Paulus, Max Planck Institute for Biogeochemistry, Germany
- 10:00 **IMPROVING BIOENERGY YIELD UNDER DROUGHT STRESS FROM FIELD TO LAB** - Esther Singer, EcoPOD Science Program Lead in Environmental Genomics and Systems Biology, Berkeley, USA
- 10:30 coffee break
- 11:00 **ECOLOGICAL STUDIES TOWARD FUTURE SUSTAINABLE AGROECOSYSTEMS**
George Kowalchuk, Utrecht University, Netherlands
- 11:30 **LYSIMETER STUDY ON TRANSPORT AND DEGRADATION BEHAVIOR OF POLY FLUOROALKYL SUBSTANCES** - Ann-Sophie Heldele, Bavarian Environment Agency, Germany
- 12:00 Lunch
- 13:00 **SOIL PROCESSES AFFECTED BY IRRIGATION WITH EITHER TREATED OR UNTREATED WASTEWATER IRRIGATION: A LYSIMETER EXPERIMENT IN MEXICO** - Christina Siebe, UNAM, Mexico City, Mexico
- 13:30 **THE RIGHT LYSIMETER FOR THE SPECIAL NEED** - Sascha Reth, UGT, Germany
- 14:00 **CONCEPT OF A COMBINED HYDROLOGICAL AND TREE PHYSIOLOGICAL MONITORING AT CORE LEVEL II PLOTS IN BAVARIA** - Stephan Raspe, Bavarian State Institute of Forestry, Germany
- 14:30 coffee break
- 15:00 **APPLICATIONS IN MONITORING PLANT WATER STATUS USING SAP FLOW AND WATER POTENTIAL**
Ben Umali, ICT International, Australia
- 15:45 **SOIL HYDRAULIC LIMITATIONS TO TRANSPIRATION**
Andrea Carminati, Mutez Ahmed, Gaochao Cai, University of Bayreuth, Germany
- 16:30 **INSTALLATION OF SAPFLOW AND PSYCHROMETER SENSORS**

Friday, March 20th

- 09:00 **IOT SYSTEMS FOR SOIL, PLANT AND ENVIRONMENTAL MONITORING**
Sam Fisher, ICT International, Australia
- 09:45 **CONFIGURING IOT NODES AND NETWORKS** - William Bruce, ICT International, Australia
- 10:30 coffee break
- 11:00 **COOLING URBAN HEAT ISLANDS - MEASUREMENTS ON THE THERMAL REGULATION EFFECTS OF URBAN GREEN INFRASTRUCTURE**
Laura Stratopoulos, Weißenstephan-Triesdorf University of Applied Sciences, UGT, Germany
- 11:30 **ANALYZING ECOSYSTEM FUNCTIONAL RESPONSES BY COMBINING EDDY COVARIANCE, LYSIMETERS, SAP FLOW AND FIELD SPECTROSCOPY: THE MANIP EXPERIMENT**
Mirco Migliavacca, Max Planck Institute for Biogeochemistry, Germany
- 12:00 **PRACTICAL SESSION: BUILDING UP AN IOT NETWORK**