



## Multi-Source Remote Sensing for Agriculture

Workshop on Advanced Earth Observation, Machine Learning and Artificial Intelligence  
for Agricultural Applications

**Date and venue:** September 10th, 2025 at ZALF, Eberswalde Str. 84, 15374 Müncheberg

**Duration:** One day (8:30 – 16:30)

**Format:** Hybrid

**Chairs:** Prof. Dr. Claas Nendel and Dr. Gohar Ghazaryan (ZALF)

**Keynote speaker:** Prof. Dr. Patrick Hostert, Earth Observation Lab, Geography Department  
Humboldt-Universität zu Berlin (HU)

**Instructors:** Dr. Benjamin Jakimow (HU), Dr. Magdalena Main-Knorn and Jahidur Rahaman (ZALF)

### Description:

KiKompAg (Künstliche Intelligenz Kompetenz in der Landwirtschaft / Building competences in using Artificial Intelligence in Agriculture) is a multi-disciplinary project that aims to coordinate and advance the concept for the integration of multisource data, artificial intelligence (AI) and various simulation methods for the cross-scale monitoring of agricultural systems.

This KiKompAg workshop aims to build comprehensive knowledge and practical skills in applying remote sensing (RS), machine learning (ML), and AI for agricultural monitoring and decision-making. Participants will gain insights into the capabilities and limitations of satellite data for addressing key challenges such as crop monitoring and sustainable land management.

Participants will:

- Assess the integration of diverse remote sensing datasets to address complex challenges in agricultural monitoring.
- Learn to construct and analyze time-series data from Sentinel-2 imagery for tracking crop phenology, including the retrieval of Land Surface Phenology (LSP) metrics like the Start-, Peak-, and End-of-Season (SoS, PoS, EoS).
- Explore Random Forest (RF)-based data fusion method using Sentinel-2 and PlanetScope to synthetically enhance temporal resolution and address data gaps.
- Gain experience in the use of AI algorithms, such as AlexNet and U-Net networks for fusing optical (Sentinel-2) and radar (Sentinel-1) data to monitor crop growth.



- Get an introduction into imaging spectroscopy and learn how hyperspectral EnMAP data can be analyzed using the EnMAP-Box.
- Evaluate how data fusion impacts the accuracy of phenological and yield-related indicators across spatial and temporal scales.

By the end of the workshop, participants will have both the conceptual understanding and technical capabilities to apply integrated RS and AI approaches in agricultural monitoring, supporting more informed decisions for farmers, researchers, and policymakers.

### Tentative Plan

Time	Presenter	Activity
8:30 – 9:00		Reception and registration
9:00 – 9:15	Prof. Dr. Claas Nendel	Welcome and opening remarks (Introduction of KIKompAg Project)
9:15 – 10:15	Prof. Dr. Patrick Hostert	Invited presentation: Novel Opportunities in Optical Remote Sensing for Agricultural Remote Sensing Towards 2030.
10:15 – 11:00	Dr. Gohar Ghazaryan	Presentation: Synergistic Use of Artificial Intelligence and Multi-Source Remote Sensing in Agriculture
11:00 – 11:15	Coffee break	
11:15 – 12:00	Dr. Benjamin Jakimow	Hands-on: EnMAP-Box
12:00 – 13:00	Lunch	
13:00 – 14:15	Dr. Magdalena Main-Knorn	Presentation: The Impact of PlanetScope-Sentinel-2 Data Fusion on Phenometrics Retrieval. Hands-on: Phenology assessment using original and synthetic optical RS data and RF-based fusion model.
14:15 – 14:30	Coffee break	
14:30 – 15:30	Jahidur Rahaman	Hands-on: Fusion of optical and SAR time series for improved characterisation of crop growth in North East Germany.
15:30 – 16:00	Prof. Dr. Claas Nendel Prof. Dr. Patrick Hostert Dr. Gohar Ghazaryan Dr. Magdalena Main-Knorn	Final discussion
End of the workshop (Group Photo)		

**Registration:** <https://forms.office.com/r/MsqAJ8JdZq>

**Deadline: September 1st, 2025**

