

# Spectroscopic Signals Beyond the light reactions: Capturing Biochemical Limitations and Photorespiratory Capacity

## Background & aim

Increased photosynthetic efficiency represents a promising frontier for achieving substantial improvements in crop yield and agricultural sustainability. However, the lack of reliable high-throughput tools limits its integration into breeding programs. To address this challenge, the JII aims to develop fast, reliable, and scalable instrumentation capable of measuring relevant photosynthetic under field conditions.

The aim of this project is to **test and validate fast protocols to quantify biochemical limitations and photorespiratory capacity**. Within the project, you will have the opportunity to expand on **sensor design**, the **environmental and developmental effects** on the photosynthetic processes, or the **genetic variability** across barley and potato genotypes, depending on your interests.



**Institute:** Jan Ingenhousz Institute

**Theme:** Crop Photosynthesis

**Type of experiment:** Greenhouse/Lab

**Location:** Wageningen

## Tasks

You will collaborate in ongoing field experiments and gain hands-on experience with several state-of-the-art techniques used to measure photosynthesis, including:

- Gas exchange measurements
- Chlorophyll fluorescence techniques
- Spectroscopy-based approaches

## Jan IngenHousz Institute

The Jan IngenHousz Institute (JII) is an open science research institute dedicated to improving photosynthesis to enhance global crop productivity, sustainability, and climate resilience. JII brings together expertise in engineering, data science, plant biology, biophysics, genetics, and breeding. We develop innovative sensors, research methods, and data analysis platforms that enable collection and interpretation of real-time field measurements of photosynthesis.

Located on the campus of Wageningen University, JII offers a dynamic, interdisciplinary environment where curiosity meets impact. If you're a student eager to apply your knowledge to photosynthetic efficiency challenges, this is your opportunity!

## What you will learn

During this project, you will integrate with the engaging research community in the JII. You will gain extensive hands-on experience in **Plant Physiology, Field/Greenhouse Research**, and experimental techniques used to quantify photosynthetic performance. You will also develop skills in **data analysis and visualization using R**, and **scientific communication**.



For more information, contact **Mauricio Tejera** ([mauricio.tejera@jii.org](mailto:mauricio.tejera@jii.org))

