



**CONTACT US**

**PHOTONICS BRETAGNE**  
4 rue Louis de Broglie | 22300 Lannion | FRANCE  
biophotonics@photonics-bretagne.com  
+33 (0)2 96 48 58 89  
www.photonics-bretagne.com



**PARTNER**

**ARVALIS**  
Agricultural technical institute  
Website : <https://www.arvalis.fr>

This partnership aims to accelerate the use of photonic innovations for agricultural applications. Arvalis brings its knowledge on the constraints and challenges of the agricultural sector and makes its means of experimentation available for the production of agronomic reference data.

**FUNDERS**



**BIOPHOTONIC ENGINEERING**

Instrumentation | Metrology | Diagnostic Aid  
For agriculture, agri-food, marine resources, environment and biomedical



# DEVELOPMENT OF INNOVATIVE TOOLS FOR DIAGNOSTIC AND CONTROL

Our Biophotonics team produces photonic instruments meeting the needs of life science industries such as the agriculture, agri-food, marine resources, environment, and even biomedical sectors. We develop innovative technological solutions through consultancy services and collaborative projects.

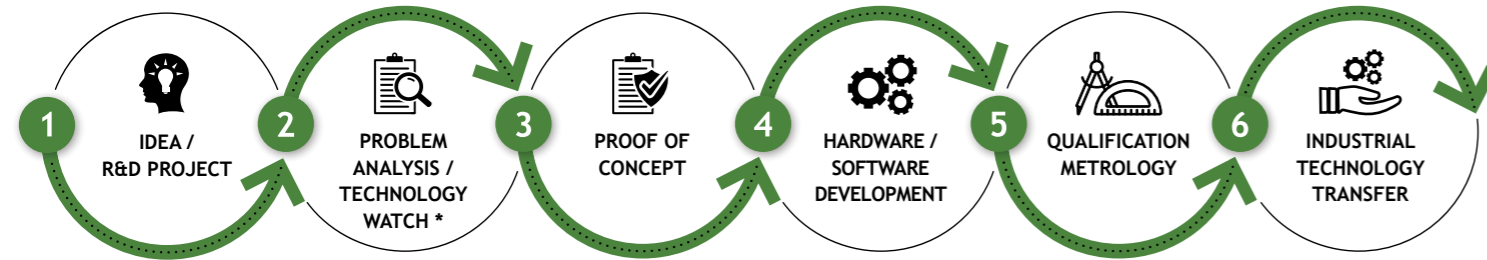
## TECHNOLOGY SERVICES

### Custom Instrumentation

- Optical design and modeling
- Integration and assembly of optical components
- Proofs of concept, demonstrators, prototypes

### Optical Metrology / Diagnostic Assistance

- Measurement and analysis of UV-VIS-IR radiation
- Calibration and characterization of optical systems
- Signal processing and analysis (AI and statistics)



\* Can also lead to a connection with our network of members/partners.

## FROM LABORATORY TO FIELD

### Optical Laboratory

Instrument development and qualification in a controlled environment.

### Outdoor Laboratory

Confronting instruments to real conditions (natural solar radiation, bad weather, movements) for their characterization and the validation of intermediate steps.

### On Site

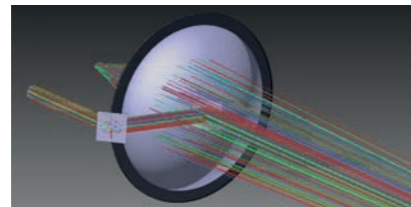
In-situ photonic instruments installation and operational evaluation (factories, laboratories, experimental stations, in the field...).



## PHENOTYPING



- Varietal selection
- Reflectance measurement with onboard multispectral lidar (VIS-IR)
- Plant stress detection

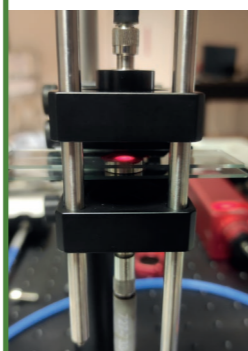


## AGRICULTURAL ROBOTICS

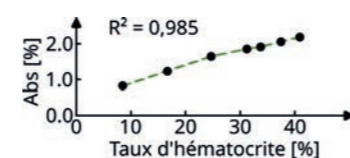


- Harvest automation
- In-situ measurement with hyperspectral imaging
- Detection (deep learning, YOLOv5) and segmentation (R-CNN) of plants
- High prediction rate of harvesting

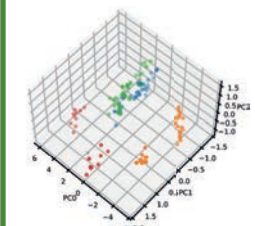
## LABORATORY EXPERIMENTATION



- Identification and quantification of biological compounds
- Measurement by absorbance and Raman
- Microscopic imaging



## QUALITY CONTROL



- Qualification from raw material to transformed product
- Measurement by absorbance, fluorescence and Raman
- Statistical analysis of photonic signals

## ABOUT US

Located in a unique French Photonics Park in Lannion (Brittany), Photonics Bretagne is a Photonics Innovation Hub which gathers:

### A Research and Technology Organisation

High level of expertise in specialty optical fibres, components and biophotonics. Services include technology consultancy, POCs, design of fibre and photonics instruments.

### An Innovation Cluster

Coordination of a network of more than 100 members: companies, research centres, schools and support agencies. Tailor-made training offer on fibre and laser technologies for employees and job seekers.

