PhotonHub Demo Centre

Photonics and Food

Course Provider

Vrije Universiteit Brussel,
Brussels Photonics,
Belgium

Course Overview

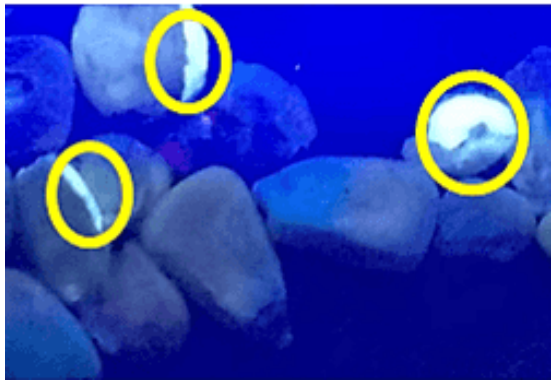
Photonics plays an important role in the screening of food products. This includes the detection of foreign objects, the classification of a product batch based on its quality, the monitoring of the (potential) presence of carcinogenic elements, authenticity tests on liquids in the framework of food fraud and the quality monitoring of water.

This one-day hands-on training course provides industry with a detailed overview of how photonics and photonics-based techniques can contribute to the quality control and safety of liquid and solid food products.

Foreign object detection

Ripeness classification of strawberries

Detection of mycotoxins in corn



Acrylamide precursors in potatoes

PhotonHub Europe

European Photonics Innovation Academy

Course Overview

Authentication of

Olive oils

Honey

Beers

Monitoring of drinking water quality

In the introduction part, the theoretical aspects of the various physical phenomena that can occur during food screening together with their related measurement setups will be discussed. Different case-studies will be presented illustrating the selection of the appropriate test set-up and data-processing techniques.

The second part of the course will focus on three demonstrators where participants can have hands-on experience.

Target Audience

It is desirable but not essential that course attendees have a basic understanding of photonics. The course is ideally suited for people from food and agriculture industry that want to explore the possibilities of implementing photonics-based techniques in their specific application. People from water companies are also highly welcomed.

Expected Outcomes

1) Understand key features of different photonics detection techniques used in food research
2) Evaluate various photonics test set-ups (hands-on activity)
3) Get familiar with machine learning techniques (hands-on activity)
4) Understand the photonic product design and manufacturing process

Course Schedule

Time	Demo Activity
09:00 – 10:30	**Course Introduction & Tutorial**
11:00 – 12:30	Demo 1: UV-VIS-NIR Absorption spectroscopy on solid and liquid food products (hands-on)
14:00 – 15:30	Demo 2: Fluorescence spectroscopy (hands-on) and scatter measurements on solid food products (illustration demo)
15:30 – 17:00	Demo 3: The use of machine learning techniques in food spectroscopy (hands-on)
17:00 – 17:30	**Follow-Up Questions & Close**

Course Trainers

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Course Manager: Nathalie Debaes

Demo 1: Prof. Heidi Ottevaere & Prof. Wendy Meulebroeck

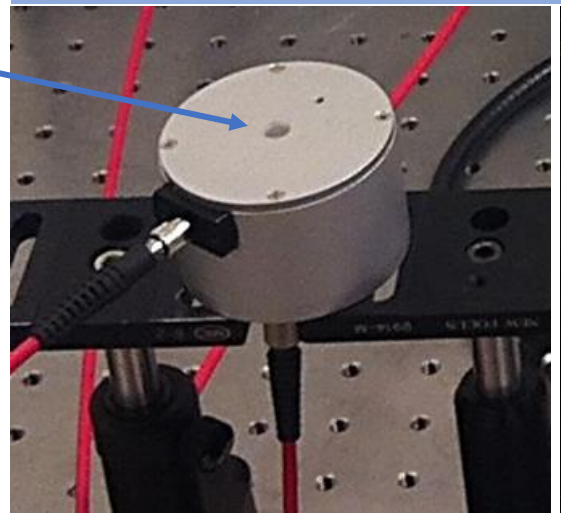
Demo 2: Dr. Lien Smeesters

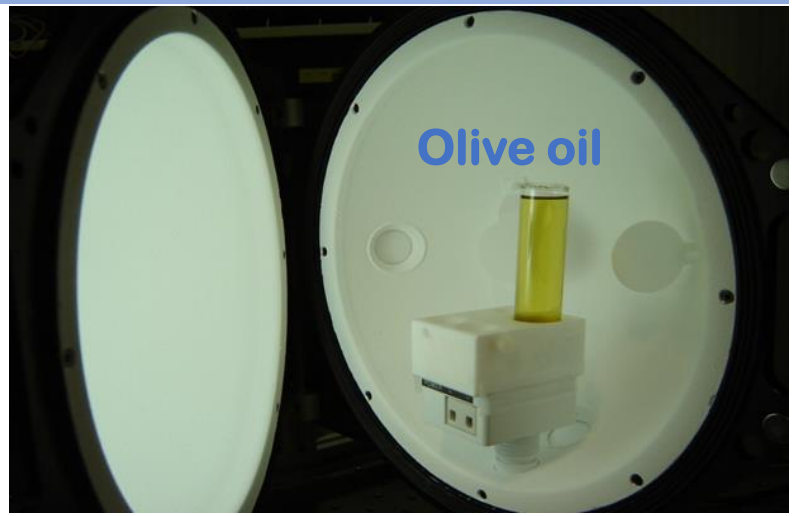
Demo 3: Ir. Indy Magnus

Course Demonstrators

Demo 1:
UV-VIS-NIR Absorption spectroscopy on solids and liquids

Corn





vinegars

olive oils

vegetables

potatoes

dried fruits

nuts

fruits

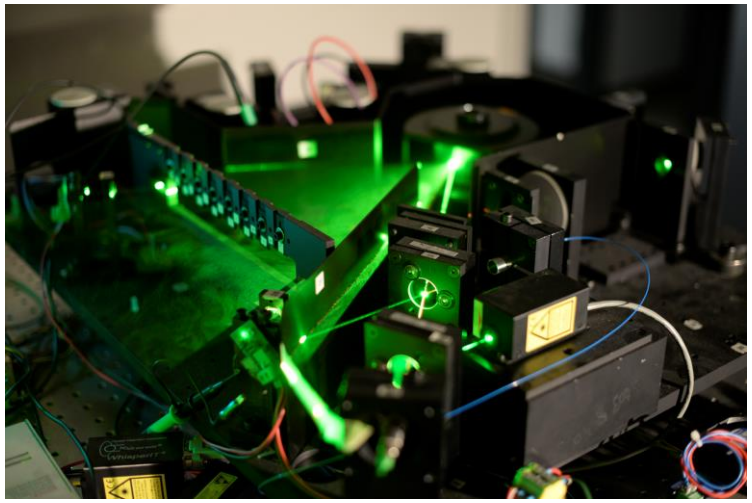
seafood

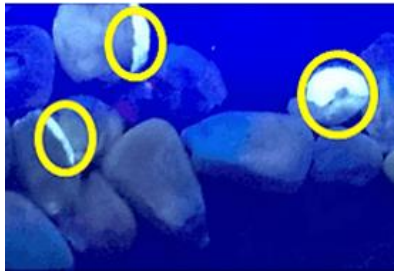
water

beers

Course Demonstrators

Demo 2:
Fluorescence spectroscopy on mycotoxins

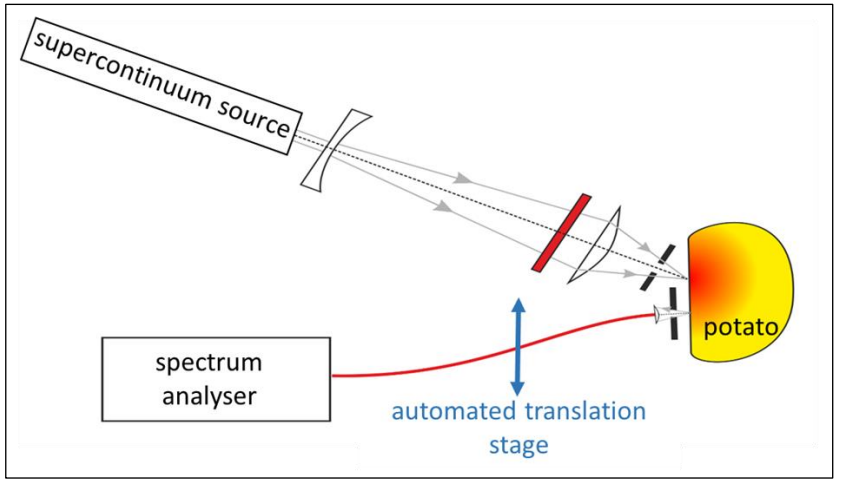




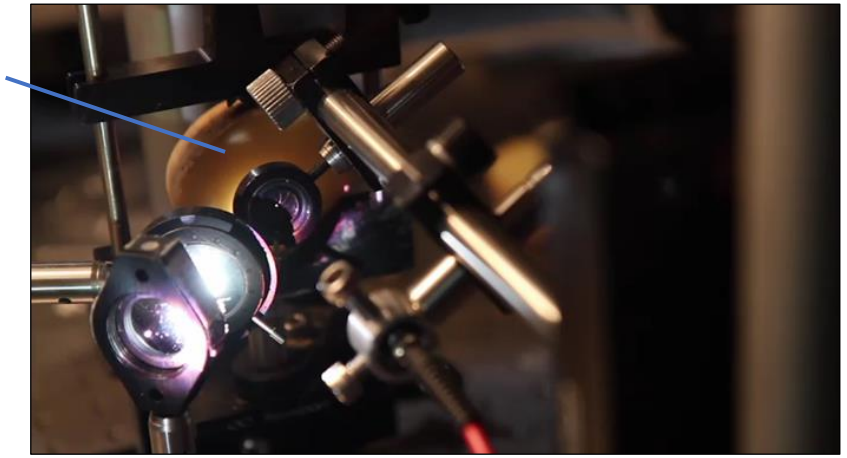
Corn

Nuts

& UV-VIS-NIR Scattering on acrylamide precursors

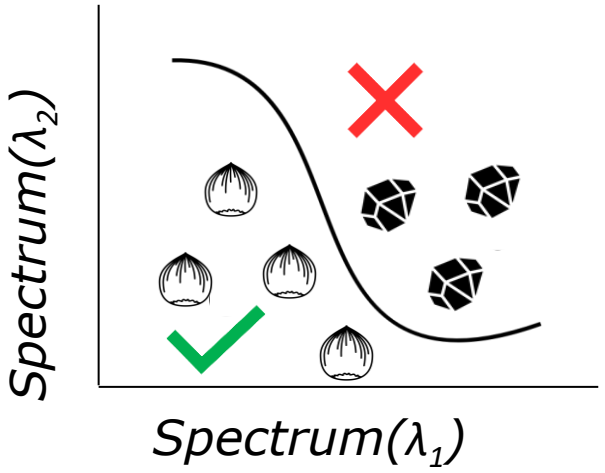


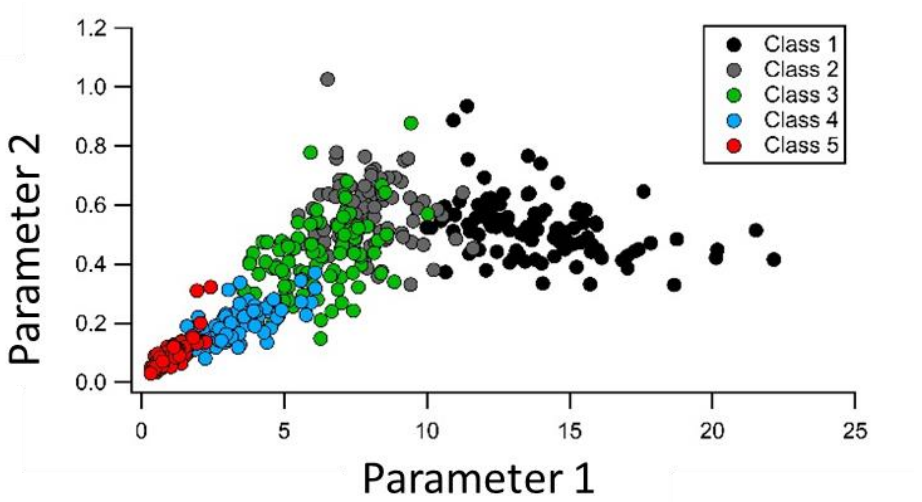
Potato



Course Demonstrators

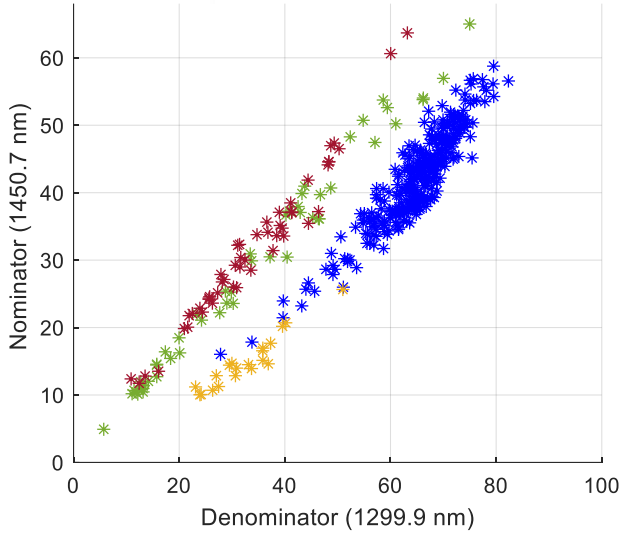
Demo 3: Machine learning on recorded food data





Strawberries

Nuts



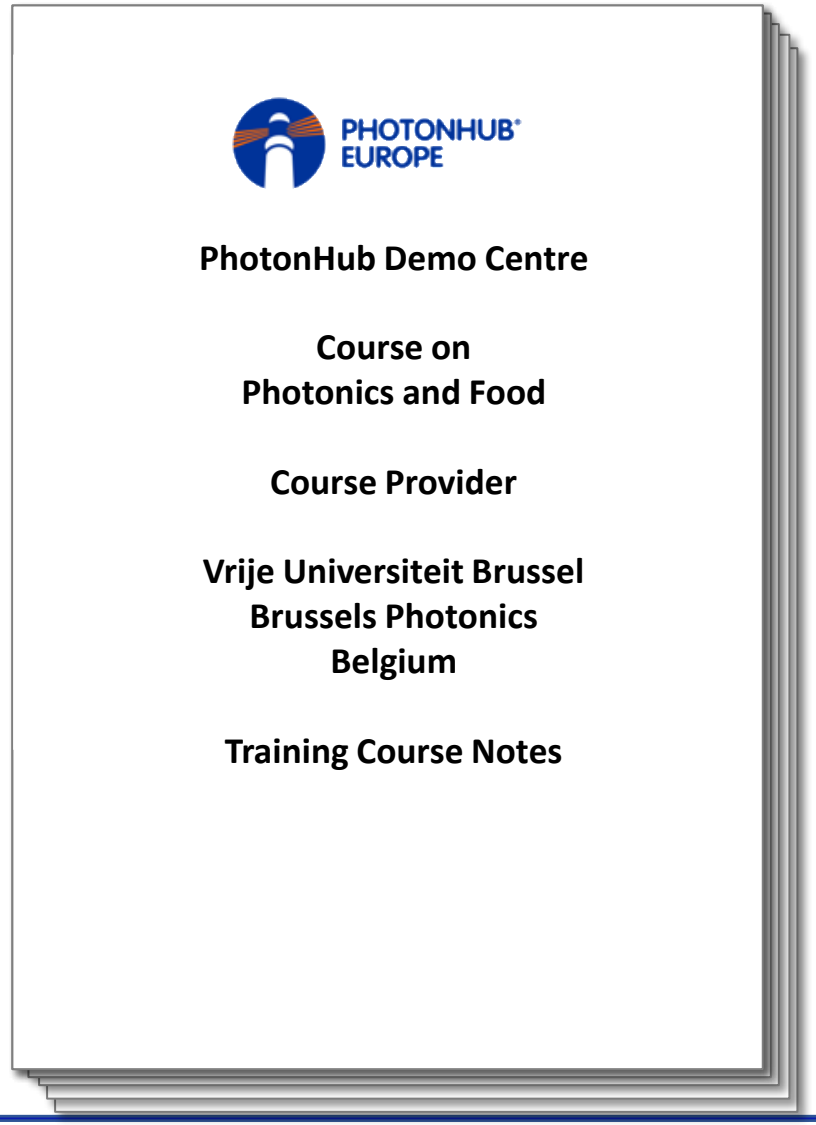
Course Location, Schedule & Cost

- Course Schedule (3 times a year – exact dates to be confirmed)
- Number of people (Groups of 3 persons per hands-on station, with a maximum of 9 persons per course)
- The course is free, in case of not showing up a fee of 100€ will be invoiced

Further Information

- DemoCentreFood@b-phot.org
- www.b-phot.org
- www.photonhub.eu/euphotonicsacademy

Course Material (technical hand-outs)



Keywords

Food sensors, Solid food products, Liquid monitoring, Spectroscopy, Absorption, Fluorescence, Scattering, Machine learning, Food quality, Food safety, Food fraud, Water monitoring.

Relevant Technology & Application Domains

Technology: Free-Space Photonic Components & Systems

Application: Relevant to all application domains