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Developing advanced modular multi-sensing system for detecting microplastics, organic pollutants, nutrient salts, and heavy metals, as well as measuring salinity and physico-chemical parameters in open water.

Université de Rennes

CNRS

LAAS CNRS

Ifremer

Tampereen yliopisto
Tampere University

mirSense
laser is smart

Géosciences pour une Terre durable
brgm

Klearia

UNIVERSITY OF PARDUBICE

UNIVERSITY OF EASTERN FINLAND

LEIBNIZ ipht
LEIBNIZ-INSTITUT für PHOTONISCHE TECHNOLOGIEN

SCIRPE
www.scirpe.fr
Group SCIRPE
Wastewater treatment for rural communities

Argotech

UNIVERSITÄT DUISBURG ESSEN
Offen im Denken

microLIQUID
experts in microfluidics

TE connectivity

MODUS
Research and Innovation

UMONS
Université de Mons
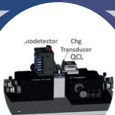
CHIPS
Chimie des Interactions Plasma Surface

Cedre

VIGO PHOTONICS

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Four novel optimally functionalized sensor modules based on complementary photonics and electrochemical technologies:
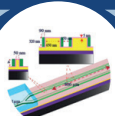
PHOTONIC SENSORS

MODULE 1

Mid-IR sensor
Chemical pollutants

High selectivity
Wide range µg/L - mg/L
LOD ≈ 75-200 ppb

MODULE 2

Vis-NIR sensor
Salinity and Microplastics

$\Delta n \approx 10^{-6}$ *RIU*
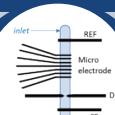(≈ salinity 1 mg/kg)
Microplastics ≥ 1 µm

MODULE 3

Optodes
Physico-Chemical parameters

O_2: 0 - 1000 µmol/L
CO_2: 0 - 200 µmol/L
pH: 5.5 - 8.5

MODULE 4

Electrochemical Sensor
*Metallic Trace Elements
and Nutrients*

Metallic Trace Elements ≈ 1 µmol/L
Nutrient salts ≈ 1 – 10,000 µmol/L

At the end of the project, these four sensors will be packaged into a modular advanced multi-sensing system and tested on site for accidental water pollution and phytoremediation wastewater treatment.