



# WaterSpy

High sensitivity, portable photonic device for  
pervasive water quality analysis

Newsletter N° 5 - October 2019

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731778. The project is an initiative of the Photonics Public Private Partnership ([www.photonics21.org](http://www.photonics21.org))

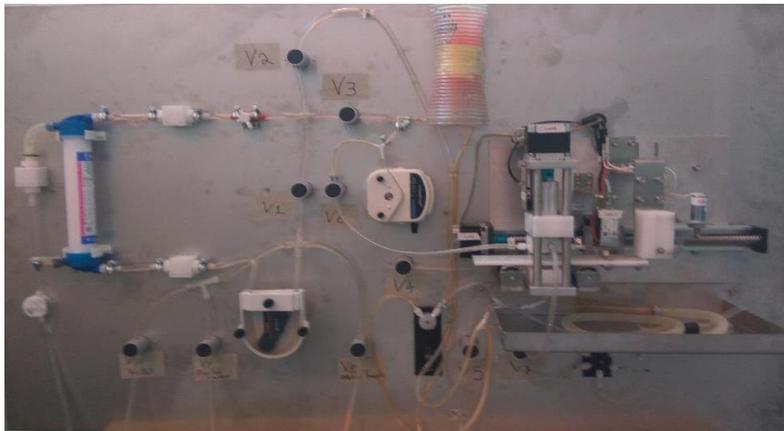


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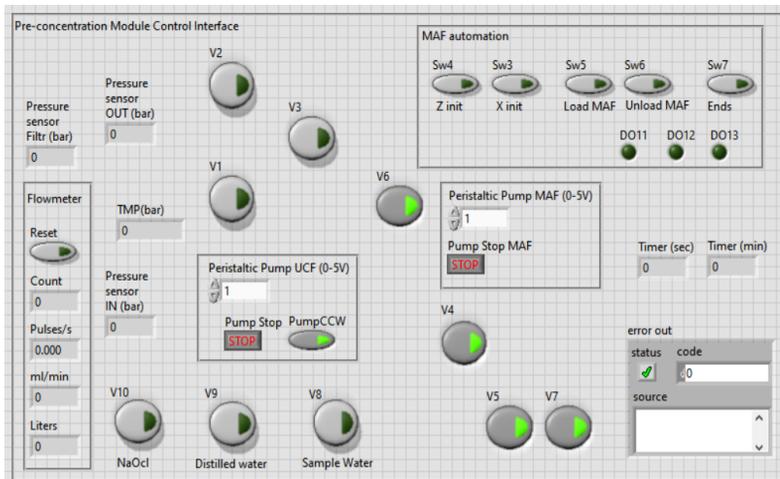
PHOTONICS<sup>21</sup>

**WaterSpy news: Pre-concentration module development**

During this period, CyRIC worked in collaboration with TUMunich to replicate a device that performs large-scale sample concentration, in order to condense the number of bacteria found in 100 L into 1 mL of water. **Figure 1** shows the pre-concentration module replica and its control interface, developed by CyRIC.



(a)



(b)

**Fig. 1 . (a) Automated pre-concentration module , (b) Pre-concentration module control interface**



# WaterSpy Meetings



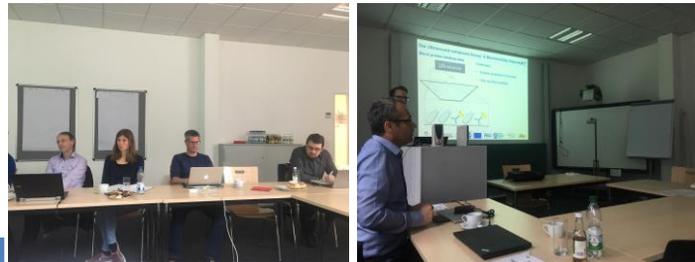
The **WaterSpy 24M** meeting was hosted on the 21<sup>st</sup> and 22<sup>nd</sup> November 2018 in Athens (Greece), where NTUA is based. All partners attended the event. Focus of the discussions was on the delivery of all updated hardware modules and the forthcoming integrated testing.



**Fig.2** M24 meeting

The **WaterSpy 30M** meeting was hosted on the 8<sup>th</sup> and 9<sup>th</sup> of May 2019 in Erlangen (Germany), where FAU is based. All partners attended the event. During the meeting the following issues have been in the centre of the discussions:

- ✓ Incubation module optimization using the new thermo-pad produced by AUG
- ✓ WaterSpy packaged lasers optimization
- ✓ WaterSpy photodetector - final version
- ✓ Integration plan - final version
- ✓ Field validation plan



**Fig.3** M30 meeting

## Main Technical Deliverables M24-M30

**D3.4** WaterSpy packaged lasers optimized for full spectral coverage integrated with driving electronics

**D4.2** WaterSpy photodetector final version

**D4.3** WaterSpy integrated photodetector and electronics

**D5.2** WaterSpy device modules v2

## Project extension!

The WaterSpy project has been extended for another four months, running now until the end of February 2020. This will give us the opportunity to run more lab and field validations.

## Planned events:

- ✓ The next WaterSpy consortium meeting (M36) will take place in Genova, Italy, where IREN is based.



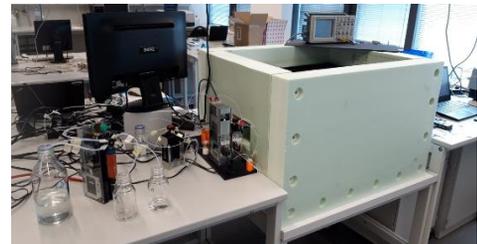
**Integration week: Wien**



An integration week was hosted by TUW in Wien from 3<sup>rd</sup> June to 7<sup>th</sup> June 2019. During the integration week, the partners finalized the second integrated system layout, including:

- (A) fluidic system setup,
- (B) communication and control setup,
- (C) power supply to each module.

Tests to validate the performance of the setup for the cleaning and sterilisation of all device hydraulics were performed.



**Fig. 4** Validations during the integration week

**Integration week: Avellino**



The third integration week was hosted by CNR in Avellino from 9<sup>th</sup> to 13<sup>th</sup> September 2019. The main focus of this week was on:

1. Pre-concentrator module testing
2. Optical module measurements
3. New thermal pad of the incubator module

Concentration experiments of *E. coli* dissolved water samples at different concentrations ( $10^5$ ,  $10^6$  and  $10^7$ ) were performed. The obtained results show a very good recovery value for the bacteria. Also, preliminary measurements of *E. Coli* with the optical module were performed.



**Fig 5.** Pre-concentrator module

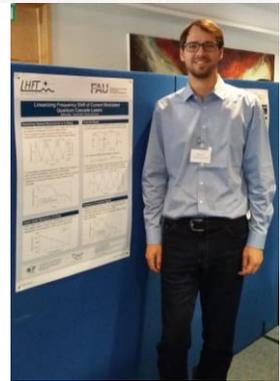
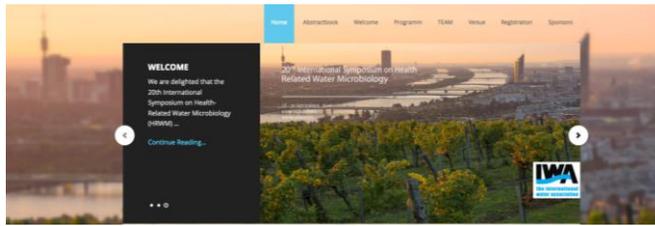
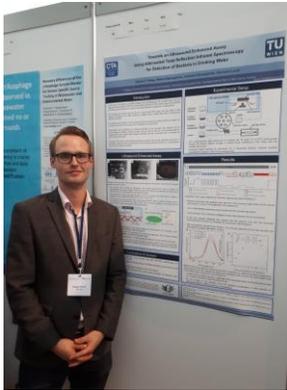


**Fig 6.** Optical module



## ✓ Events

The WaterSpy consortium participated in several workshops ... some pictures of the events:



TUW

FAU

## ✓ WaterSpy project papers



### WaterSpy: A High Sensitivity, Portable Photonic Device for Pervasive Water Quality Analysis

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Article  
pubs.acs.org/ac

### An Acoustic Trap for Bead Injection Attenuated Total Reflection Infrared Spectroscopy

Stephan Freitag,<sup>1</sup> Bettina Baumgartner,<sup>2</sup> Stefan Tauber, Christoph Gasser,<sup>3</sup> Stefan Radel, Andreas Schwaighofer,<sup>4</sup> and Bernhard Lendl<sup>5</sup>

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## ✓ New Leaflet



### Quantum cascade lasers with discrete and non equidistant extended tuning tailored by simulated annealing

NICOLAS VILLA,<sup>1</sup> GRÉGORIY STRÜBI, TOBIAS GRESCH, JÉRÉMY BUTET, STÉPHANE BLASER, AND ANTOINE MÜLLER

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Stay tuned!

# WaterSpy Consortium



## **New partner onboard!**

GISIG has joined the consortium to assist IREN with the standardisation and post-project exploitation activities.