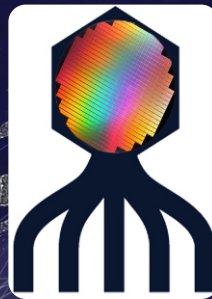


# NEWSLETTER

ISSUE

03

February 2024



Optical Circuit switched Time sensitive network architecture for high-speed Passive optical networks and next generation Ultra-dynamic & reconfigurable central office environments

## OCTAPUS

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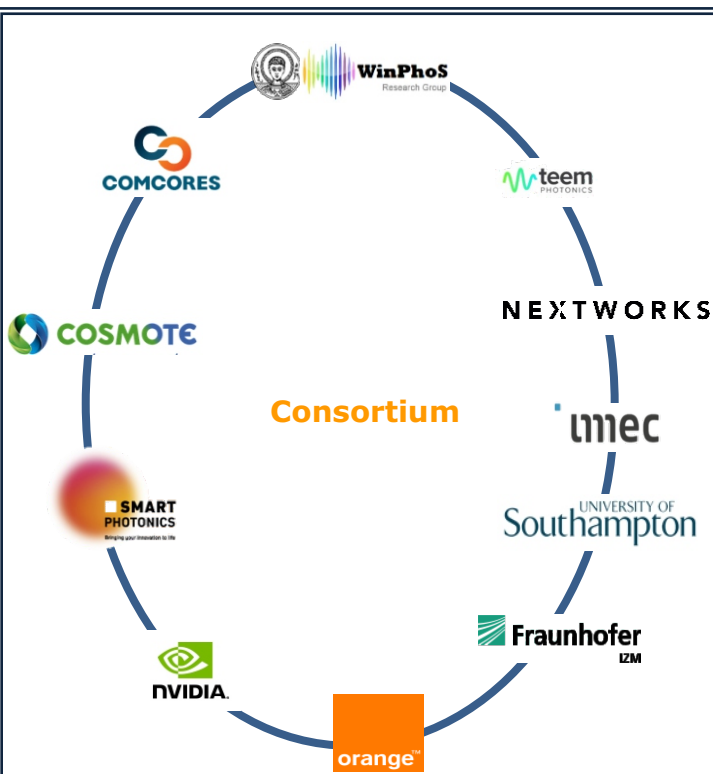
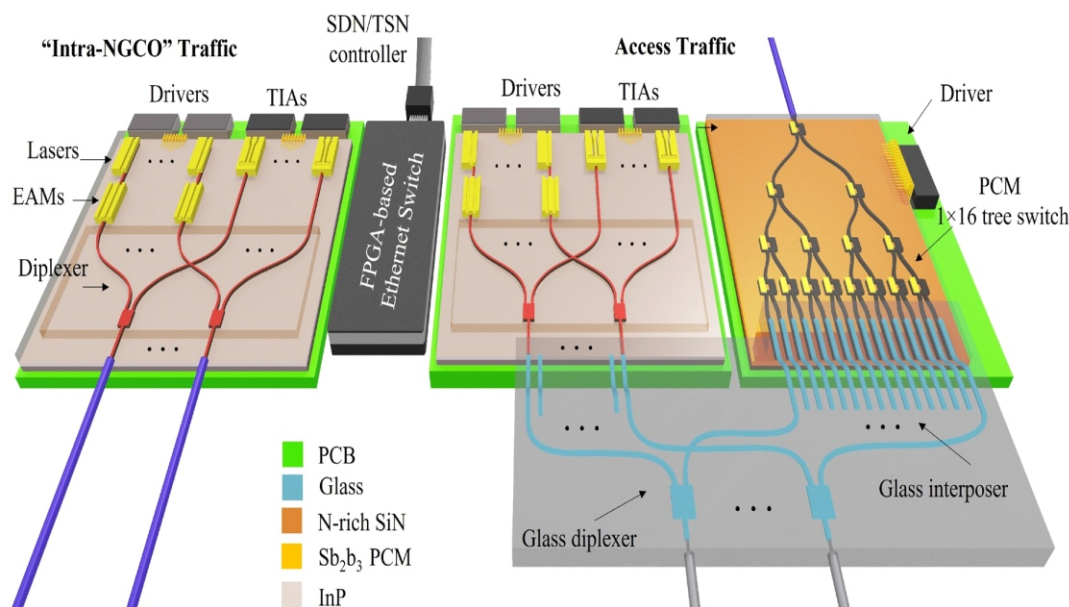
HORIZON EUROPE

The New EU  
Framework Programme for  
Research and Innovation  
2021-2027



### The OCTAPUS Vision

To deliver an agile, low-cost and energy efficient PIC technology framework that will re-architect the NGCO (Next Generation Central Offices) ecosystem, transparently upgrading its capacity to 51.2Tb/s and beyond, through an innovative optically switched backplane and transceiver toolkit allowing three layers of traffic provisioning; i.e., optically switched express path time-sensitive & best-effort traffic classes.



**Grant Agreement Programme** 101070009  
HORIZON-CL4-2021-DIGITAL-EMERGING-01

**Duration** 09/2022 – 2/2026 (42 months)

**Budget** € 5,883,941.25

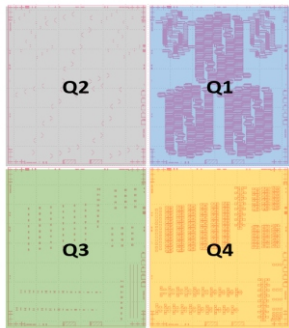
**EU Contribution** € 4,789,661.00

**Coordinator** Aristotle University of Thessaloniki (GR)

**Contact** **Prof. Nikolaos Pleros** ([npleros@csd.auth.gr](mailto:npleros@csd.auth.gr))  
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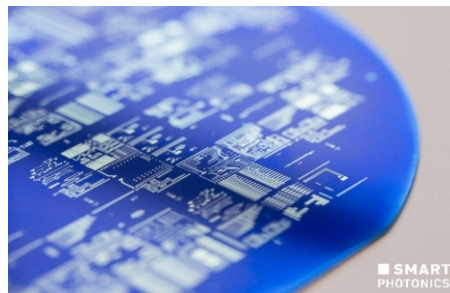
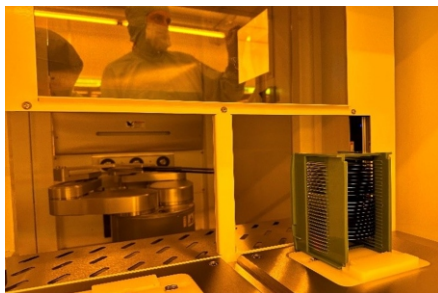
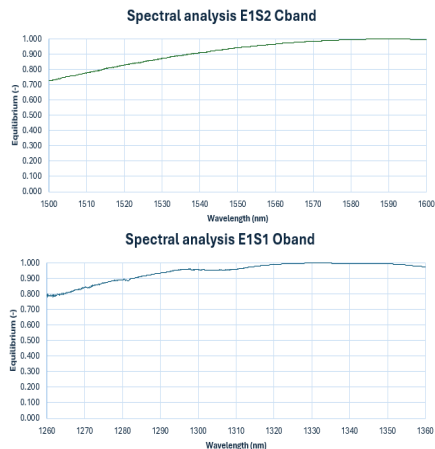
## Technical Progress

### 1 Development of Optical Switching Components



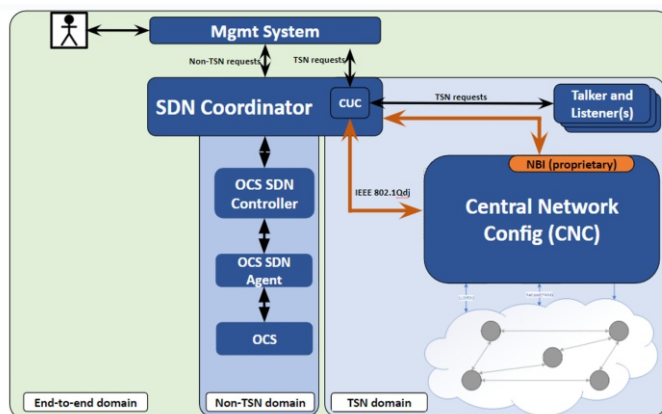
► The fabrication stage of the 1<sup>st</sup> generation of PCM switching elements will be completed at the beginning of March 2024. The evaluation of the chips will follow.

► The glass-based O-band/C-band interposer diplexer was successfully developed and tested. The 2<sup>nd</sup> run of development was also completed. Graphs showing the enhanced ratios at both arms of diplexer output ports for both C and O bands.



► In November 2023, SMART Photonics started the fabrication of the first Tx/Rx devices designed in OCTAPUS by AUTH. The design has been performed using the newly released Process Development Kit (PDK) for O-band by SMART Photonics.

### 2 Development of Time Sensitive Network (TSN) Technologies and Integration with SDN Programmable Network Controller

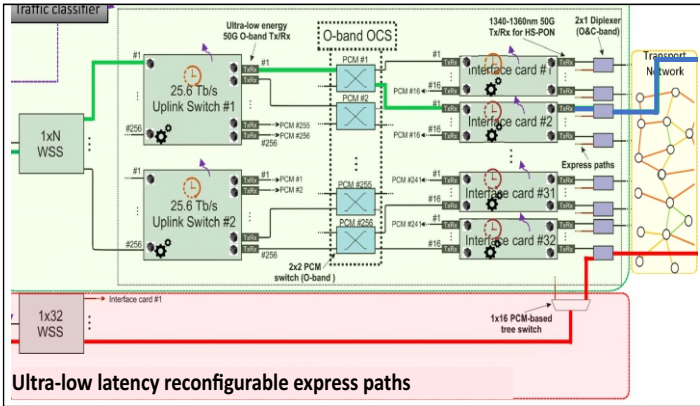


Finalization of the end-to-end Control plane functional architecture. The end-to-end functional architecture for the NGCO Control plane follows a hierarchical approach for managing the not-TSN domain (the optical network) through the OCS SDN Coordinator and the TSN network through the Central Network Controller (CNC). The Deliverable D2.2 reports more details of each single functional elements and their main interactions.



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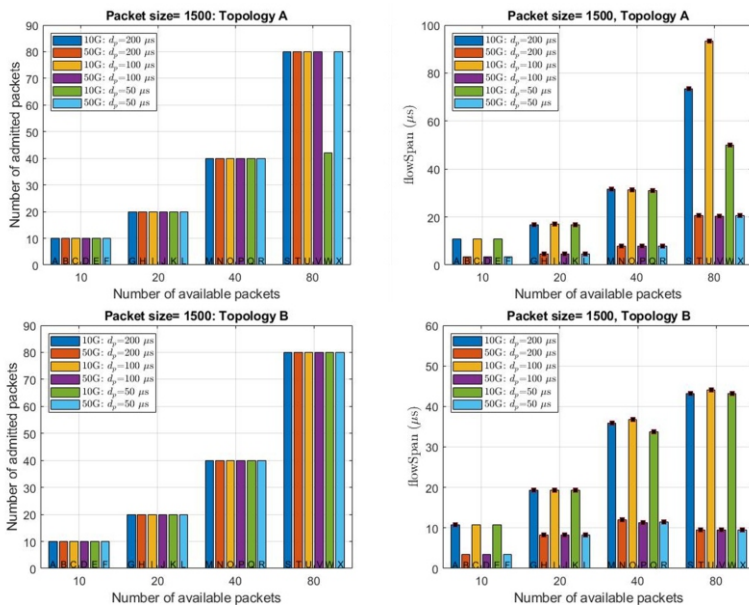
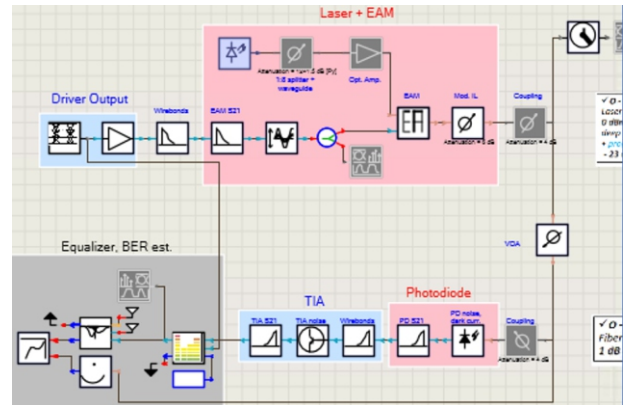
## System & Component Modeling and Network Simulations



- [Link1](#): Short Reach path– O Band
- [Link2](#): Long Reach path– extended O Band
- [Link3](#): Express Path– C Band

Power budget, link distance, PON splitting ratios have been calculated.

The first validated simulation model of electro-optical components was completed and used for the intra-NGCO link ([Link 1](#)). The model is being extended to include the long reach transmissions ([Link 2](#)) and the Express path ([Link3](#)).



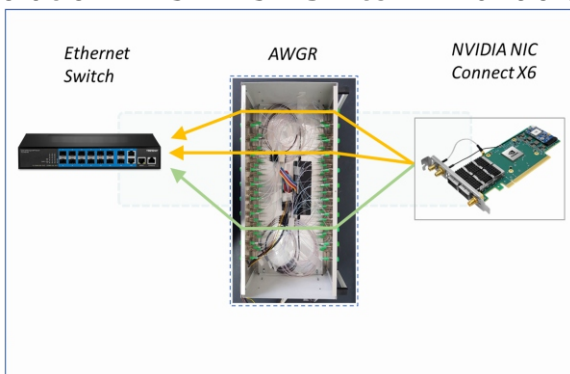
Modeling and evaluation of an optimization-driven joint scheduling/routing scheme for time-sensitive applications.

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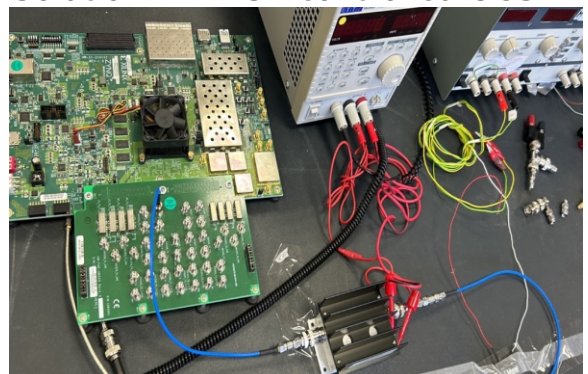
## Experimental Lab Activities on the OCS-OCTAPUS architecture

### Experimental implementations of a Reconfigurable OCS:

Solution A: 32 x 32 Switch + Tunable SFP



Solution B: FPGA controlled OCS



## Dissemination Activities

All dissemination activities can be found at:

<http://octapus-ict.eu/index.php/dissemination/publications>

- ✓ 2 Journal papers
- ✓ 13 Conferences
- ✓ 1 presentation at Standardization body/Organization
- ✓ 5 presentations at exhibitions
- ✓ 4 Other publications

### PAST PRESENTATIONS

#### OCTAPUS at TFS Ecosystem Day - Castelldefels, Spain, 18 October 2023



The OCTAPUS project was presented in TFS Ecosystem Day, in a talk regarding the use and extension of the ETSI TeraFlow SDN to support the control plane of a hybrid network serving TSN and non-TSN flows.

#### OCTAPUS at Orange Open Tech Days - November 2023



Orange presented a demonstration at "Orange Open Tech Days" showing the ability to deploy the 50G-PON over their passive infrastructure coexisting with current PON systems (G-PON and XGS-PON). OCTAPUS was mentioned as the European project that is developing technologies to support this evolution.



## **Dissemination Activities**

### **OCTAPUS at IEEE GLOBECOM - Kuala Lumpur, Malaysia, 4–8 December 2023**



Dr. Agapi Mesodiakaki presented the work of the WINPHOS Research Group entitled "An Optimized Medium-Transparent MAC Protocol for Multi-service FIWI 5G Transport Networks" in GC in Kuala Lumpur, Malaysia.

### **OCTAPUS at "Photonics PhD Days" - January 2024**



The OCTAPUS project was presented at "Photonics PhD days" by PhD student Georges Gaillard as part of a poster presentation titled "Evolution of optics in future generation of Central Office".

## **UPCOMING PRESENTATIONS**

### **OFC 2024 – San Diego, California, USA, 24–28 March**

"A Versatile PtP Network Architecture with Multi-Rate Adaptation from 100 Gbit/s to 10 Gbit/s", Georges Gaillard, Fabienne Saliou, Dylan Chevalier, Gaël Simon, Philippe Chanclou, Luiz Anet Neto, Michel Morvan, Bruno Fracasso, POSTER PRESENTATION.

### **PACET 2024 – Thessaloniki, Greece, 28–29 March**

"Flexible Optical Circuit Switched Network Architecture based on Tunable SFP+ Transceivers for Reconfigurable Low Latency 5G/6G Networks", Georgios Michail, Maria Vargemidou, Christos Vagionas, Marios Gatzianas, George Kalfas, Ronis Maximidis, Agapi Mesodiakaki, Nikos Pleros and Amalia Miliou, ORAL PRESENTATION

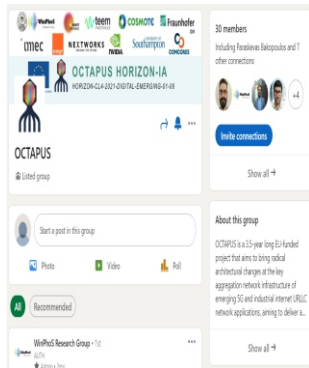
# Communication Activities

## Communication Channels

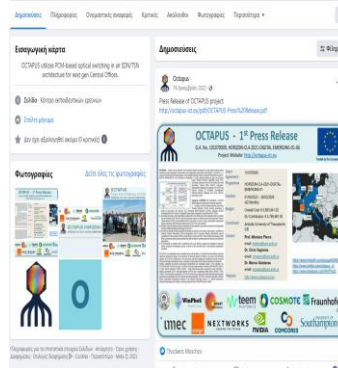
website



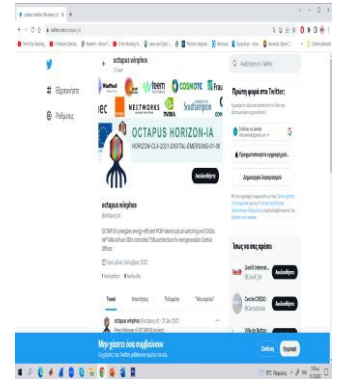
LinkedIn



Facebook



Twitter



**Website** (<https://www.octopus-ict.eu>)

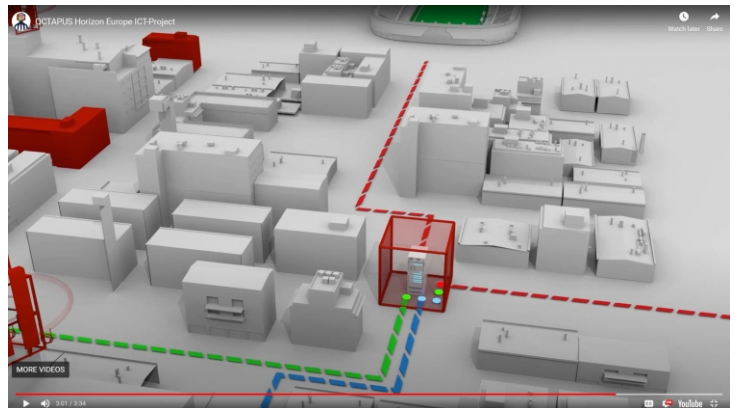
**LinkedIn** (<https://www.linkedin.com/groups/9249210/>)

**Facebook** (<https://www.facebook.com/octopus.ict>)

**Twitter** ([https://www.twitter.com/octopus\\_ict](https://www.twitter.com/octopus_ict))

## OCTAPUS Video Presentation

The video presentation of the OCTAPUS project, which highlights the vision and objectives of the project has been released on YouTube. Watch it ***Here!*** or scan the QR code:



## UPCOMING MEETINGS

### M19 Consortium Meeting

The 4th General Assembly meeting of the OCTAPUS project will take place on 5-6 of March 2024 in Grenoble, France. The meeting will be hosted by TEEM.

### First Review Meeting

The 1st review meeting of the OCTAPUS project will be held online on April 30, 2024. The progress and activities of the first 20 months of the project will be presented.