NEWSLETTER

ISSUE
01
APRIL 2023

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

OCTAPUS

In this issue

Motivation and Vision p.1
OCTAPUS at a Glance p.2-3
Technical Progress p.4
Dissemination Activities p.5
Communication Activities & Consortium meetings p.6

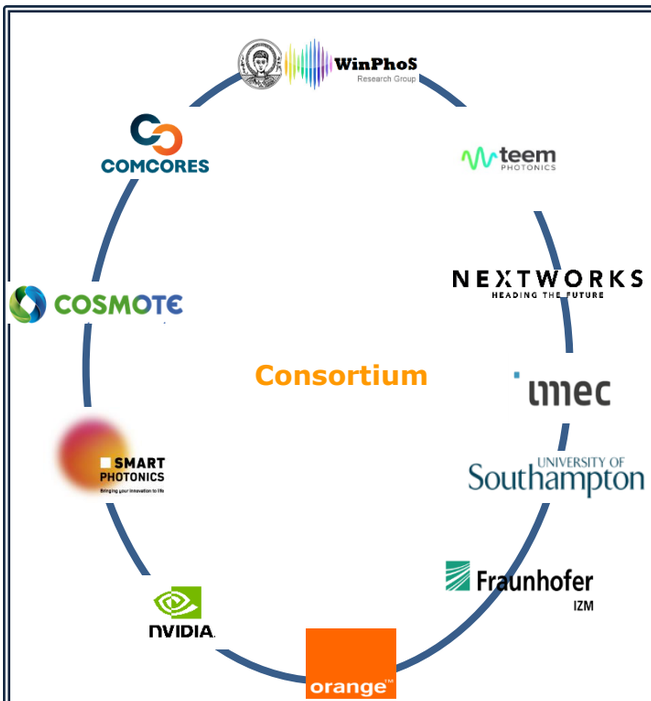
PHOTONICS21
PHOTONICS PUBLIC PRIVATE PARTNERSHIP

OCTAPUS Motivation and Vision

The rising global demand for fixed and mobile bandwidth capacity on the one hand, fueled by the increasing popularity of Over-The-Top (OTT) video streaming services and the rise of Machine-to-Machine communications, and on the other, the emerging 5G and industrial Internet applications, classified under the Ultra-Reliable and Low Latency Communications (URLLC) category, are currently posing a new strict capacity/latency -oriented framework severely challenging 5G infrastructure and calling urgently for new radical architectural changes directly at the key aggregation infrastructure being in local proximity to the subscribers: **the Central Offices** (COs). At the same time, they underline the need for the employment of innovative technological solutions, with **photonics** emerging as the key enabling technology, that will establish a **Next Generation Central Office** (NGCO) ecosystem where component-level advancements can yield unparallel architectural benefits. Towards this end, OCTAPUS will reap the benefits of best-in-class material platforms and technologies, namely:

- the novel integration of antimony-based Phase Change Materials (PCM) on the low-loss and low-cost N-rich SiN (Si_3N_4) for its switching components,
- the excellent optoelectronic properties of InP-based O-band optical components for its transceiver modules,
- the mature and low-cost Si CMOS process for its ultra-low power electronics, and
- the low loss and compact interfaces to fibers, through advanced glass-based interposers with integrated diplexer functionalities,

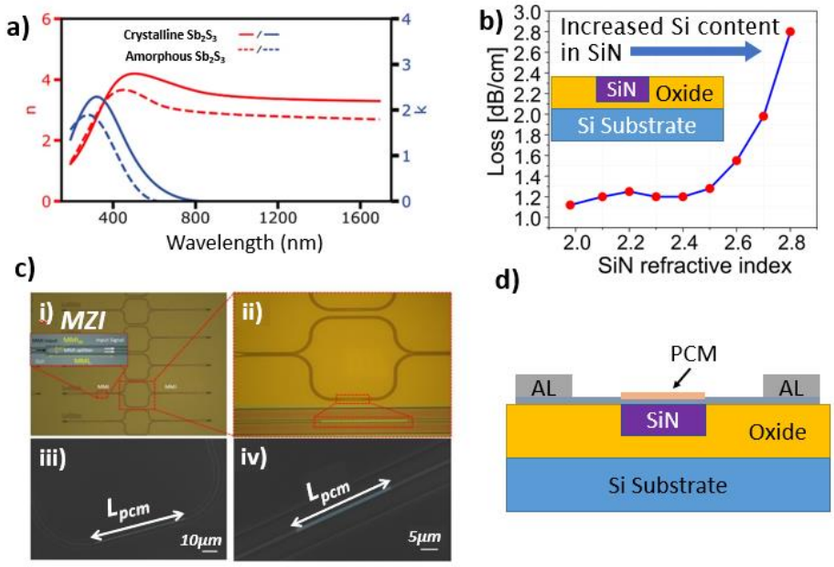
to deliver an agile, low-cost and energy efficient PIC technology framework that will rearchitect the NGCO ecosystem, transparently upgrading its capacity to 51.2Tb/s and beyond, through an innovative optically switched backplane and transceiver toolkit.



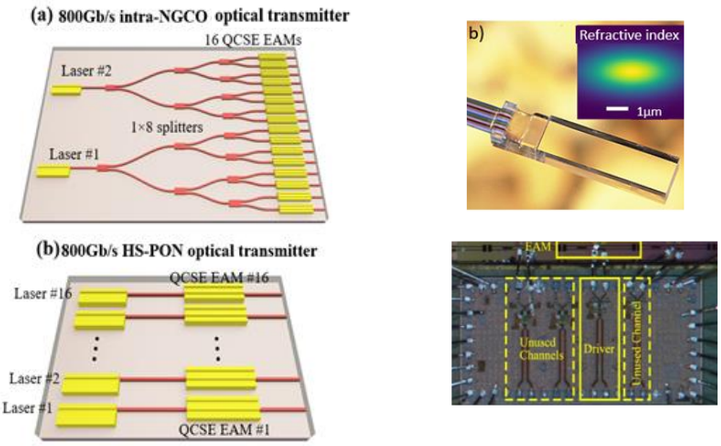
Grant Agreement	101070009
Programme	HORIZON-CL4-2021-DIGITAL-EMERGING-01
Duration	09/2022 – 2/2026 (42 months)
Budget	€ 5,883,941.25
EU Contribution	€ 4,789,661.00
Coordinator	Aristotle University of Thessaloniki (GR)
Contact	**Prof. Nikolaos Pleros** (npleros@csd.auth.gr)
	Dr. Chris Vagionas (chvagion@csd.auth.gr)
	Dr. Marios Gatzianas (mgatzia@csd.auth.gr)

OCTAPUS at a Glance

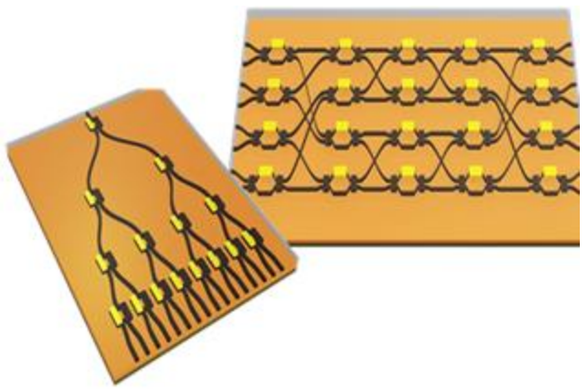
Obj 1: Sb phase change materials (PCMs) to develop zero-power and ultra-low loss SiN-based electro-refractive switches



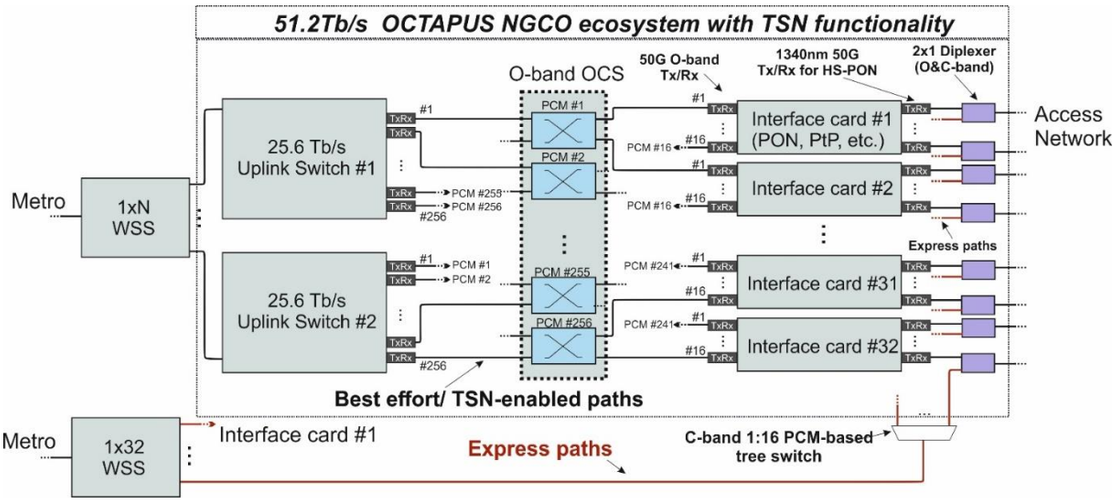
Obj 2: O-band 50GHz component to demonstrate up-to 800G optical transceiver engines with Glass WAFT interposers and



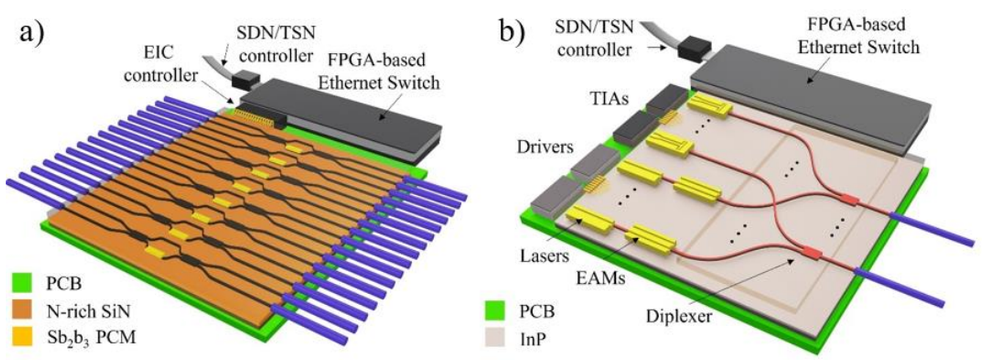
Obj 3: Advanced optical components for low-power and ultra-fast reconfigurable optically-enabled backplane technology for NGCO electro-refractive switches

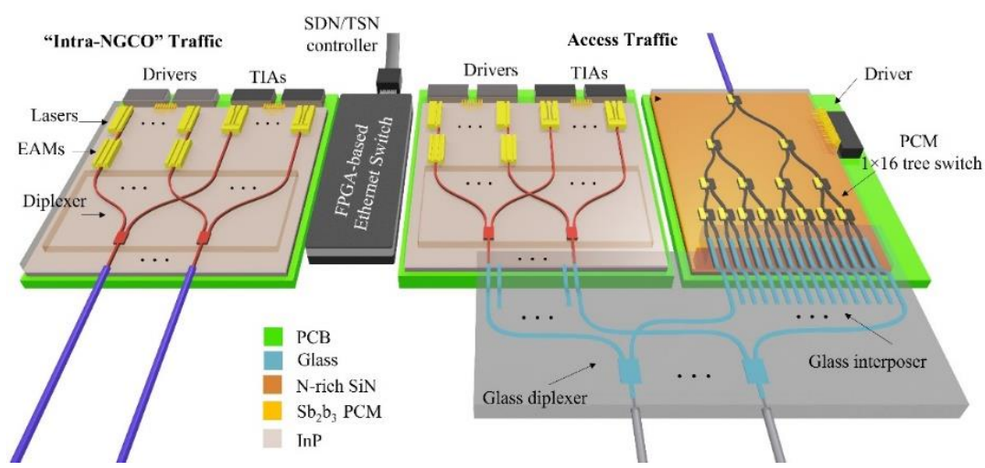


Obj 4: SDN-reconfigurable NGCO ecosystem offering deterministic service guarantees for time-sensitive traffic



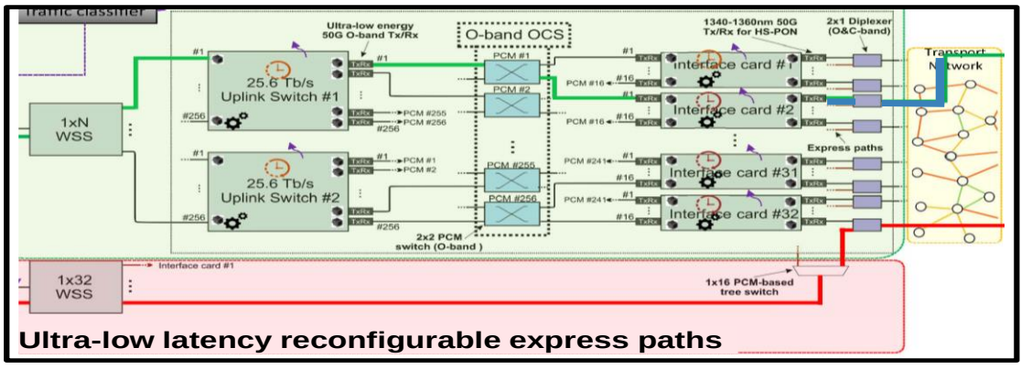
Obj 5: Demonstrate a scalable NGCO architecture with up-to 200Tb/s capacity





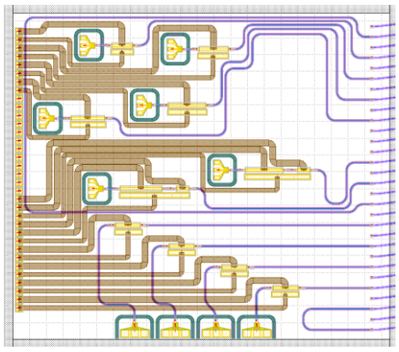
Technical Progress

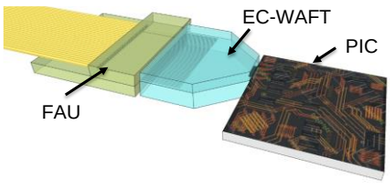
1 System Architecture and Network Topology

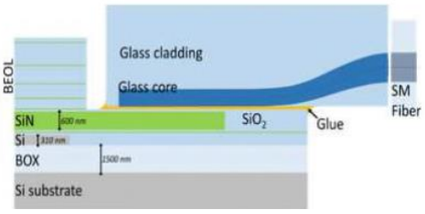


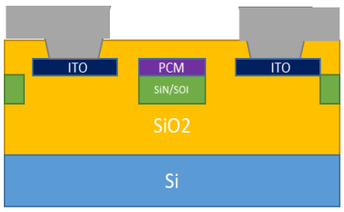
- ***Link1:*** *Short Reach path – O Band*
- ***Link2:*** *Long Reach path – extended O Band*
- ***Link3:*** *Express Path – C Band*

2 Development of optical switching components

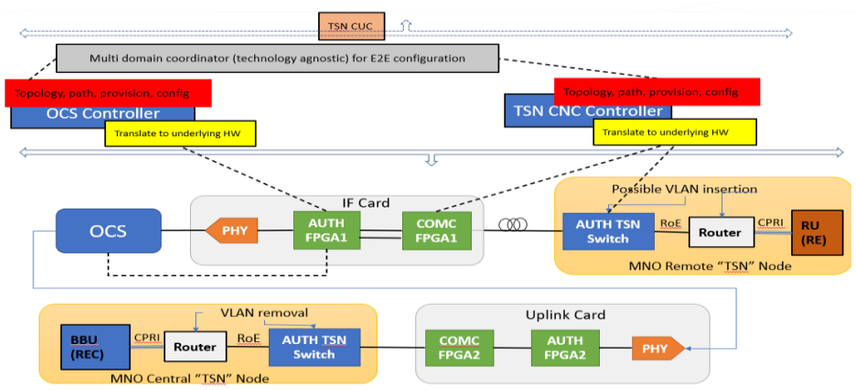








3 Development of Time Sensitive Network (TSN) technologies and integration with SDN programmable network controller



Dissemination Activities up to 07M

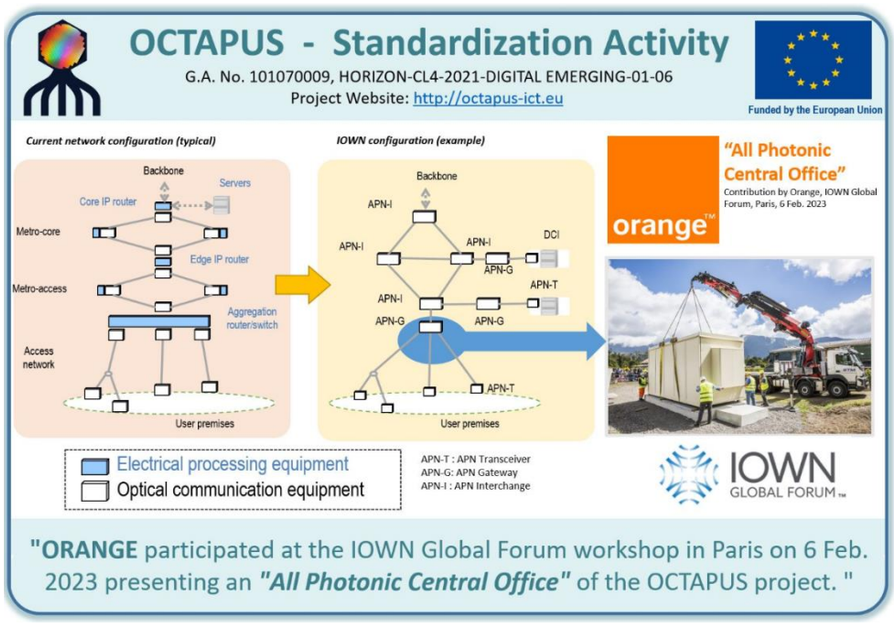
All dissemination activities could be found at:
http://octapus-ict.eu/index.php/dissemination/publications

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

OUTSTANDING

IOWN Global Forum

ORANGE participated at the **IOWN Global Forum workshop** in Paris on 6 Feb. 2023 presenting an "All Photonic Central Office" of the OCTAPUS project.



Photonics Partnership Annual Meeting

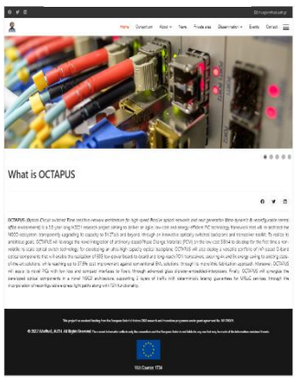
OCTAPUS project will be presented at the Photonics Partnership Annual Meeting (Photonics21 Partnership) on April 26-27 in Brussels.

More information and the agenda of the Photonics Partnership Annual Meeting 2023 can be found on the following link:
https://www.photonics21.org/events-workshops/2022/12/2022-12-15-Photonics-Partnership-Annual-Meeting-2023.php

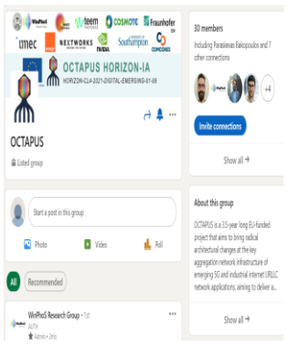
Communication Activities

Communication Channels

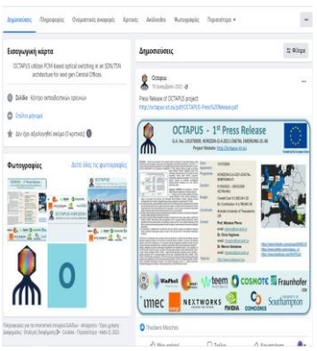
website



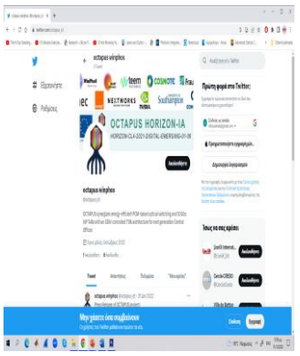
LinkedI



Facebook



Twitter



Website (https://www.octapus-ict.eu)

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

Facebook (https://www.facebook.com/search/top?q=octapus%20project)

Twitter (https://www.twitter.com/octapus_ict)

Consortium Meetings

Kick-off meeting

The kick-off meeting of the EU-funded project OCTAPUS took place on October 4-5, 2022, at the premises of the WinPhoS Research Group of the Aristotle University of Thessaloniki (AUTH) in Thessaloniki, Greece. Administrative procedures were discussed and an overview of all work-packages and scientific approaches to be followed was made.

M07 Consortium meeting

The M07 consortium meeting of the EU-funded project OCTAPUS took place on March 23-24, 2023, at COSMOTE Headquarters in Athens, Greece. The focus of the discussion was: design and fabrication of the first chips with subsystems, components specifications along with the development of TSN technologies and SDN programmable network controller.