



### Factsheet

Grand Agreement: 761989

Duration: Sep 2017 - Aug 2020 (36 Months)

Coordinator: Aristotle University of Thessaloniki

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Project website: [www.5g-phos.eu](http://www.5g-phos.eu)

Total Budget: € 9,621,446.25 Euros

EC contribution: € 7,848,540.88 Euros



[www.5g-ppp.eu](http://www.5g-ppp.eu)



# 5G phos

[www.5g-phos.eu](http://www.5g-phos.eu)

"5G integrated Fiber-Wireless networks exploiting existing photonic technologies for high-density SDN-programmable network architectures"

5G PPP

HORIZON 2020

European Commission



## What is 5G-PHOS?

5G-PHOS is a Phase II 5G-PPP EU research project that aims to architect novel 5G fronthaul networks for ultra-dense and hotspot use cases by exploiting the recent advances in optical communications, producing an integrated Fiber-Wireless (FiWi) packetized C-RAN fronthaul supporting massive mmWave MIMO communications.

### Analog Radio over Fiber

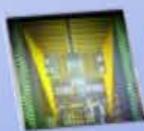
#### Optical Beamformers



#### Optical InP Transceivers



#### Mini-ROADMs



### Converged FiWi fronthaul

#### High-bandwidth:

- 25 Gbps
- 100Gbps
- 400 Gbps

#### 10x energy reduction

#### Sub-ms delay

#### Ethernet Compatible Transmission



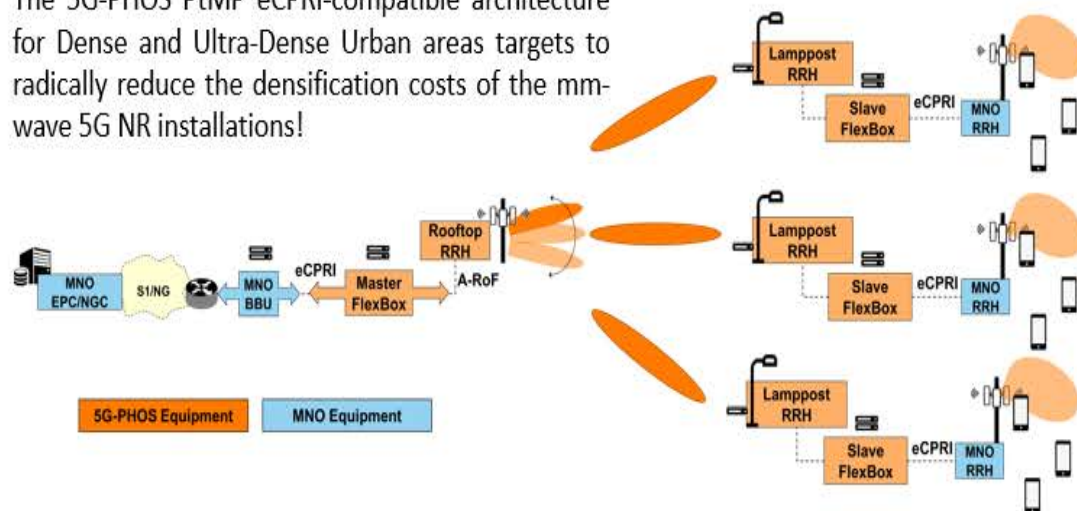
Powerful FPGA-based DSP



#### Multi-core Network Controller for Resource allocation & Slicing

## Converged FiWi fronthaul architecture for Dense Areas

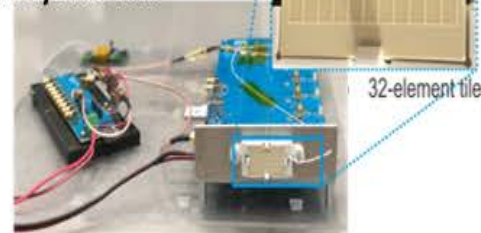
The 5G-PHOS PtMP eCPRI-compatible architecture for Dense and Ultra-Dense Urban areas targets to radically reduce the densification costs of the mm-wave 5G NR installations!



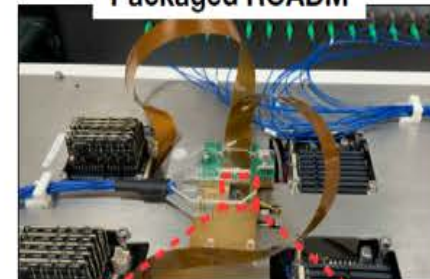
## mmWave MIMO antenna & Photonic Integrated Chips

The 5G-PHOS technologies have been demonstrated in end-to-end multi-user Fiber Wireless V-band uplink transmissions scenarios through the massive MIMO antenna and IFOF fronthaul using Frequency Division Multiplexing (FDM) or Spatial Division Multiplexing (SDM)

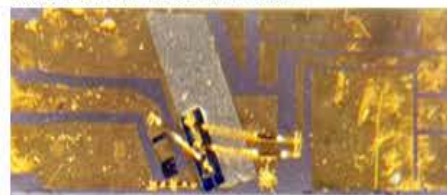
### 32x element Phased Array Antenna



### Packaged ROADMs



### External Modulated Laser



### ROADM PIC Zoom-in



## Trials and Demonstrations

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