



Optical Communications in the 5G Framework in H2020

ONDM 2017

Budapest, 15 May

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The Outline

- *Horizon 2020 & 5G PPP – what for?*
- *The Prizes Instrument – our (CNECT) first prize was on Optical*
- *H2020 Call 2 – Optical Topics within 5G*
- *Photonics PPP – EU funding for telecom in FP7 and H2020*
- *Planning of the next Work Programme 2018-20 & FP9*

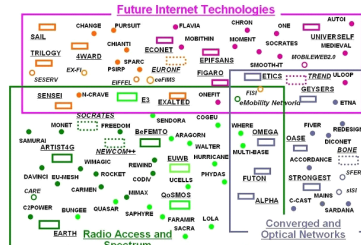
Horizon 2020 - for Research and Innovation



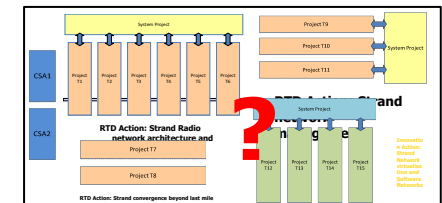
More impact!
-> KPIs

FPx  <http://cordis.europa.eu/fp7/c4future-networks/jr>

Loosely coupled projects



H2020 PPP structuring



Phases 1 & 2: R&I on multiple technologies and architectures
Phase 3: validation in a system context & multiple use cases (as per 5G AP)

6 years

Commitment / Time dimension

Horizon Prize

**Breaking the Optical
Transmission Barriers**

Horizon Prize

BREAKING THE OPTICAL
TRANSMISSION
BARRIERS

Crack the **challenge**
and **win**

€500 000

Apply by **15/03/2016**

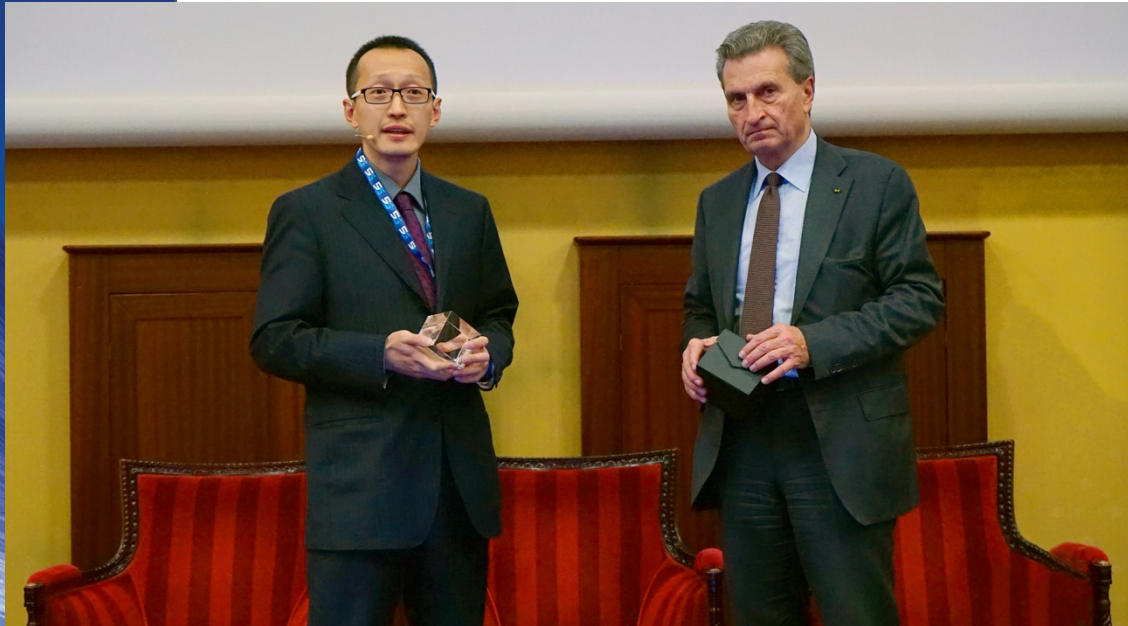
www.ec.europa.eu/horizonprize/optical
#horizonprize

Maximise the fibre transmission capacity per channel, reach, spectrum range/efficiency

- **aims at incentivising radical breakthrough solutions, as opposed to incremental progress, in the area of point-to-point optical fibre transmission, overcoming the current limitations of long distance fibre transmission systems**

Horizon Prize

BREAKING THE OPTICAL
TRANSMISSION
BARRIERS



Horizon Prize Winner

PHOTONMAP

Department of Photonics Engineering, Technical University of Denmark (DK)
University of Southampton (UK)
Fujikura Ltd (JP)

*The award was given in
Rome, during the second
Global 5G Event on 9
November 2016*



H2020 Call 2 (5G PPP Phase II)

Optical topics



ICT 7 - Smart optical and wireless network technologies

a.2.High capacity elastic - optical networks

Research and Innovation Actions

Key: core and metro transport capacity/flexibility

Three successful projects with optical elements (NB: GAs not signed):

METRO-HAUL

blueSPACE

5G-PICTURE

METRO-HAUL

"to design and build a smart, but cost-effective, **optical metro infrastructure** able to support traffic originating from heterogeneous 5G access networks, addressing the anticipated capacity increase and its specific characteristics such as mobility, low latency, and high bandwidth."

22 partners, coordinated by BT (UK)

EU funding: 7.8 MEUR

Duration: 36 months



blueSPACE

"will exploit the added value of Spatial Division Multiplexing (SDM) in the Radio Access Network (RAN) with efficient optical beamforming interface for the pragmatic Ka-band wireless transmission band."

15 partners, coordinated by TU/e (NL)

EU funding: 6.7 MEUR

Duration: 36 months

5G-PICTURE

"will develop and demonstrate a converged fronthaul and backhaul infrastructure integrating advanced wireless and novel optical network solutions."

19 partners, coordinated by IHP (DE)

EU funding: 8.0 MEUR

Duration: 30 months

ICT 8 - 5G PPP Convergent Technologies

a.1. Ubiquitous 5G access leveraging optical technologies

Innovation Actions

Key: to develop and assess new optical access network solutions based on integrated optical device prototypes

One project with optical elements was successful (NB: GA not signed):

5G-PHOS

5G-PHOS



"aims to architect and evaluate 5G broadband wireless networks for dense, ultra-dense and Hot-Spot area use cases drawing from recent results in the area of optical technologies towards producing and exploiting a powerful photonic integrated circuit technology toolkit."

17 partners, coordinated by Aristotle University of Thessaloniki (GR)

EU funding: 7.8 MEUR

Duration: 36 months

EU funding for Photonics



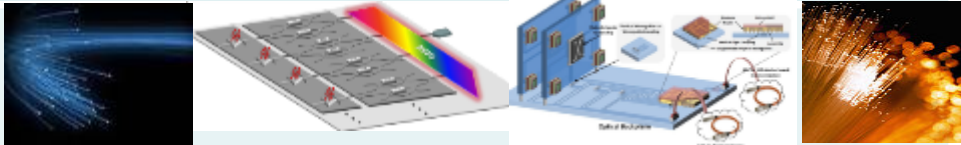
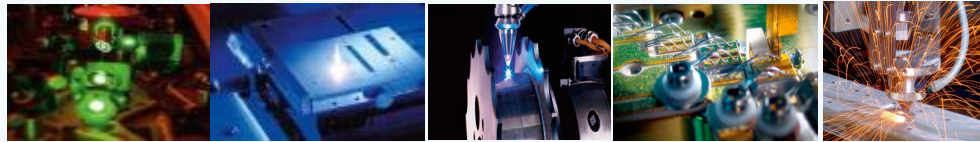



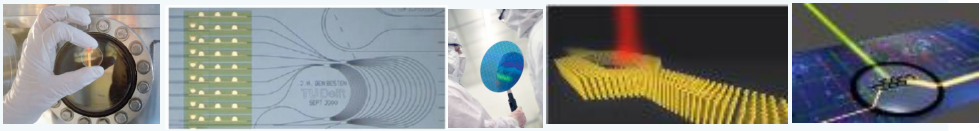
PHOTONICS PUBLIC PRIVATE PARTNERSHIP

PHOTONICS²¹

EU main research priority areas Photonics

in FP7 (2007-2013) & H2020 (2014-2016)

198 projects for ~ 736 M€

| Areas | FP7 | H2020 | |
|--|--------------|-------------|---|
| Optical data Communications | 31 103 M€ | 4 14 M€ |  |
| Lasers and Manufacturing | 10 47 M€ | 15 53 M€ |  |
| Biophotonics Health&Food | 26 98 M€ | 16 62 M€ |  |
| SSL Lighting, Displays & OPVs | 19 92 M€ | 9 51 M€ |  |
| Sensors for safety & security | 16 44 M€ | 9 39 M€ |  |
| Integration Platforms & Nanophotonics | 15 58 M€ | 8 42 M€ |  |
| Cross-cutting Support Actions | 12 19 M€ | 8 14 M€ | Education and training, Roadmapping, Coordination between regional/national clusters, Coordination of the Photonics research constituency, Access to advanced technologies, Support to SMEs |

ICT 30.a Research and Innovation Actions

i. Application driven core photonic technology developments for a new generation of photonic devices (including components, modules and sub-systems)

for agile Petabit/s Optical Core and Metro Networks

actions 6-8 M€, 100% funding

Objective: new photonic technologies allowing capacities of Pb/s per node, and Tb/s per channel and 100 Tb/s per link over increased transport distances while supporting network programmability features and fitting network operator requirements and roadmaps.

Requirements: actions

- ✓ should include all new device developments for the envisaged network architecture
- ✓ should lead to network solutions with an energy consumption and equipment footprint reduction by more than 10 and a significant reduction in network cost
- ✓ may include system, network, control and security level aspects to the extent necessary

Expected Impacts:

- next generation agile, high-capacity and energy efficient core & metro networks to support the highly connected and communicating society
- secured industrial leadership in optical communications systems for core & metro networks and reinforcing the full value chain in Europe

H2020 WP 2018-20 & FP9 planning

2018-20 Work Programme / state of play

- Planned adoption & the launch of Call 1 in October 2017
 - ***Subject to final MS approval***
 - I: 5G End-to-End facility; 5G for CAD
 - II (July '18): 5G validation trials across multiple verticals; 5G LTE
 - **NB:** ICT Proposers' Day in **Budapest** in November 2017!
- The text of the Call for 2020 to be finalised next year
- Optical topic suggested in the 2020 part (opened in 2019)
 - Paving the way towards FP9, where we are considering a theme on **All-optical networks**, with an emphasis on energy efficiency
- We would welcome **a structuring paper** from the Optical community for the purpose of preparing for next WP / FP9!

More information

Horizon2020 web site:

[*http://ec.europa.eu/programmes/horizon2020/*](http://ec.europa.eu/programmes/horizon2020/)

H2020 Participant Portal:

[*http://ec.europa.eu/research/participants/portal/desktop/en/home.html*](http://ec.europa.eu/research/participants/portal/desktop/en/home.html)

H2020 on line manual :

[*http://ec.europa.eu/research/participants/portal/desktop/en/funding/guide.html*](http://ec.europa.eu/research/participants/portal/desktop/en/funding/guide.html)

5G PPP:

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

Blogpost and interview of the Horizon Optical Prize winner:

[*https://ec.europa.eu/digital-single-market/en/blog/photonmap-winner-horizon-prize-optical-transmission-technologies*](https://ec.europa.eu/digital-single-market/en/blog/photonmap-winner-horizon-prize-optical-transmission-technologies)

Köszönöm!

Thank You!

Any questions?

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