COST Action CA19111

First Newsletter

European **NE**t**W**ork on **F**uture Generation **O**ptical Wireless **C**omm**U**nication Technologie**S**

Funded by the Horizon 2020 Framework Programme of the European Union

Acknowledgement

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COST description

COST (European Cooperation in Science and Technology) is a funding agency for research and innovation networks. Our Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation.

Steering Committee

Dr. Ali Khalighi - *Action chair*

Prof. Fary Ghassemlooy - *Action Vice-chair*

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Dr. Nobby Stevens - *WG2 chair*

Prof. Stanislav Zvanovec - *WG3 chair*

Ms. Amita Shrestha - *WG4 chair*

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NEWSLETTER #1

Dear Reader,

This Newsletter is a starting point to explore the themes, investigated by the COST Action CA19111 "European **NE**t**W**ork on **F**uture Generation **O**ptical Wireless **C**omm**U**nication Technologie**S** (**NEWFOCUS**)", related to optical wireless communications (OWC) as one of the key enabling technologies for Beyond-5G (B5G) networks.

The ever-increasing demand for bandwidth in high-speed and ubiquitous wireless access with high reliability has risen the need of designing future wireless communication networks. In this regard, the COST Action NEWFOCUS will investigate OWC as an efficient technology that can satisfy the demanding requirements of backhaul and access network levels in B5G networks, as well as the support of varied and sophisticated services and applications in vertical sectors with a low environmental impact.

COST Action NEWFOCUS has officially started on 8th September 2020, on the 1st Management Committee (MC) meeting, and will be implemented for a period of four years. Due to COVID-19 pandemic, the 1st MC meeting has been attended online via Zoom platform.

Research Program

Two major research pillars will be investigated by the NEWFOCUS consortium, dealing with the development of:

1. OWC-based solutions capable of delivering **ubiquitous**, **ultra-high-speed**, low-power consumption, highly secure, and low-cost wireless access in different application scenarios, in particular, supporting Internet-of-Things (IoT) for smart environments..
2. **Flexible** and **efficient** backhaul/fronthaul OWC links with **low latency** and compatible with access traffic growth.

Global networking platform

In addition to scientific and technological advances, NEWFOCUS will serve as a global networking platform through capacity building of all relevant stakeholders including universities, research institutions, major industry players, small medium enterprises, governmental bodies and non-governmental organisations.

Within this rich consortium, NEWFOCUS will pursue the cutting-edge Research & Innovation in OWC, targeting inter-chip and on-board satellite communications, smart environments, manufacturing and healthcare, high-precision indoor localization, ultra-high-capacity indoor/outdoor wireless networks, Intelligent Transportation Systems (ITS), high data rate wireless ultra-wide links, ultra-reliable long-range space communications, etc.

NEWFOCUS at a Glance

40 Countries

- 36 COST countries
  - 19 Inclusiveness Target Countries (ITCs)
  - 2 COST International Partners (Japan, Canada)
  - 2 Near-Neighbor Countries (Libano, Egypt)

91 Researchers

Main events

- 2 MC meetings / year
- 1 Training school / year
- Annual Workshop
- Final Conference

Furthermore, a **training activity** of experts will be carried out, in order to accompany related European industries for the standardisation and commercialisation of the OWC technology. A Special Interest Group (SIG) will be formed from Action participants with experience in international standardization committees, which will be responsible for submission of specific recommendations on OWC to international standardization bodies.

Methodology

NEWFOCUS has adopted a methodology that is based on the use of a matrix-type coordination structure. Members will be split into five Expert Groups (EGs) with complementary expertise on various aspects of OWC. Different Working Groups (WGs) will draw the required expertise from EGs and build upon the coordinated efforts among experts from different disciplines who traditionally work independently.

NEWFOCUS WGs organization

OWC-based solutions for smart cities and ITS

NEWFOCUS will carry out extensive research works based on analytical, simulation-based and experimental verifications on four major application areas, which are defined by the transmission range and each assigned to a specific WG, i.e.:

1. **WG1** focuses on the usage of OWC for ultra-short-range applications. These include inter and intra-chip communications, high performance computing systems, as well as device to device communications in hyper dense IoT scenarios, such as wireless body-area networks for medical application.

2. **WG2** aims at the design of OWC-based solutions for short-range applications such as indoor wireless access and massive IoT applications. Typical application scenarios include high-speed / IoT indoor wireless connectivity, indoor positioning and sensing, and machine-to-machine communications in smart industrial environments.

3. **WG3** aims to develop practical high-reliability Visible Light Communications (VLC)-based solutions for smart-cities and ITS, first- and last-mile access and backhaul/fronthaul wireless

networks, free space optics (FSO) and hybrid FSO/RF adaptive wireless connections, as well as underwater OWC.

4. **WG4** aims to develop airborne and satellite FSO links for deployment in the backhaul/fronthaul wireless networks infrastructure. It will also deal with space-to-ground optical data links, inter-satellite communication links, ground-to-air and air-to-air links, and long-range non-LoS ultraviolet transmissions.

Partners

COST Action NEWFOCUS aims at serving as a pan-European scientific framework for OWC research synergizing the required interdisciplinary expertise throughout Europe, and leading cutting-edge research activities in this field with the goal of positioning OWC as one of the key enabling wireless network technologies for a wide range of applications.

We will have the next meeting in Spring 2021, hopefully in a physical venue. In the meantime, we are to build the NEWFOCUS website, where you will find news and results from our project.

Attendees from the 1st MC meeting on 8 Sept. 2020

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This poster is based upon work from COST Action NEWFOCUS, supported by COST (European Cooperation in Science and Technology).