

COST Action CA19111

Second Newsletter

European **NEtWork** on **F**uture Generation **O**ptical Wireless **CommU**nication Technologies**S**



Funded by the Horizon 2020 Framework Programme
of the European Union

Acknowledgement

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



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NEWSLETTER #2

Dear Reader,

This is the second newsletter of our COST Action NEWFOCUS project, related to optical wireless communications (OWC) as one of the key enabling technologies for Beyond-5G (B5G) networks.

Since the beginning of the COST Action, NEWFOCUS project has advanced in the definition of a logo that better depicts the main topics covered by the Action. A **Logo Creation Contest initiative** has been suggested in order to involve all the interested main country members and substitutes, especially students and post-docs, to send in their logo design idea.

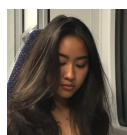
The logo that has been selected as NEWFOCUS official logo has been created by *Ahmed Gaafar Ahmed Al-Saffak*, PhD candidate at the University Carlos III of Madrid (UC3M, Spain), nominated as winner of the Logo Creation Contest. He will be invited to attend the next NEWFOCUS Working Group meeting.

Furthermore, in the framework of NEWFOCUS COST Action and other related projects and CSNDSP conference, it was held an Art Competition on technical themes related to OWC. Nineteen art works, taken by students and showing artistic and technical features, have been submitted and evaluated by (i) Artists: *Dr Mitra Mamarzia* (UK) and *Azar Emdadi*, and (ii) IET, UK.

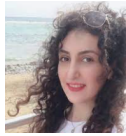
The OWC Art Competition winners are the followings:



1st Price - EU VISION: Khadijeh Ali Mahmoodi (Özyeğin Üniversitesi, Turkey) - *"Using a mirror-based optical wireless communication for dating purposes in olden days"*



2nd Price - IET: Zun Htay (Northumbria University, UK) - *"Planets"*



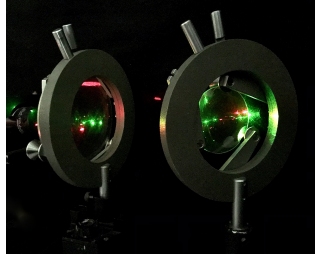
Joint 3rd Price - NEWFOCUS/CSNDSP:

Behnaz Majleseini (Las Palmas de Gran Canaria, Spain) - “*Underwater OCC*” and Cecilia Pesce (Northumbria University, UK) - “*The light sight*”

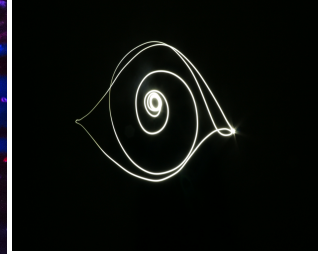
1st Prize – EU VISION



2nd Prize - IET



Joint 3rd Prize – NEWFOCUS/CSNDSP



Our sincere congratulations to the winners!! The 2nd Art Competition will be on 10 March 2022. Save the date!

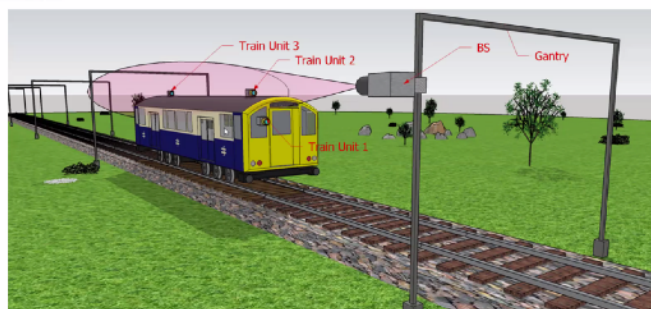
NEWFOCUS 2nd MC meeting

We are still living a pandemic due to COVID-19 disease, and due to the sanitary restrictions, technical meetings are expected to be run online. The Second Management Committee (MC) meeting has taken place on 26-27 April, 2021. Also this second event will be run in a fully virtual format (via Zoom platform).

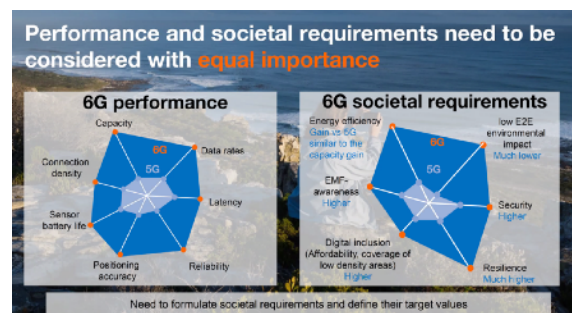
During the meeting, four relevant invited talks have been given, covering different areas of OWCs i.e.:

1. “Low-Loss Optical Interfacing in ultra-short-reach optical interconnects”, Prof. Jürgen Van Erps, Vrije Universiteit Brussel
2. “Challenges for the future 6G Networks”, Dr. Eric Hardouin, Orange Labs

Northumbria University
NEWCASTLE



Heritage in Free-Space Optical Air-To-Ground and Space-To-Ground Communication



Challenges for the future 6G Networks

3. “Free-space optical communications for high-speed trains”, Dr. Mojtaba Mansour Abadi, Northumbria University
4. “Heritage in Free-Space Optical Air-To-Ground and Space-To-Ground Communication”, Dr. Benjamin Roediger, DLR

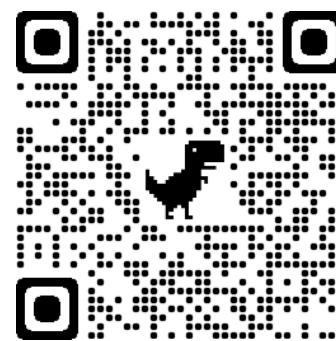
S TSM Call for Applications

Short-term scientific missions (STSM) are exchange visits between researchers involved in a COST Action, allowing scientists to visit an institution or a laboratory in another COST Member state, COST Cooperating Member or COST Near-Neighbour Country part of the Action. The goal of STSM is to foster collaboration in excellent research infrastructures and share new techniques that may not be available in a participant's home institution or laboratory.

In the overall NEWFOCUS Cost Action, there will be 4 STSMs Calls for Applications per Grant Period. The 1st Grant Period is 01/11/2020 – 31/10/2021, and the following calls are due:

1. First Call (01/04/2021-30/04/2021): This call is running during the month of April 2021. The deadline of this First Call is on the 30th April 2021.
2. Second Call (01/07/2021-31/07/2021): This call will run during the month of July 2021. The deadline of this Second Call will be on the 31st July 2021.

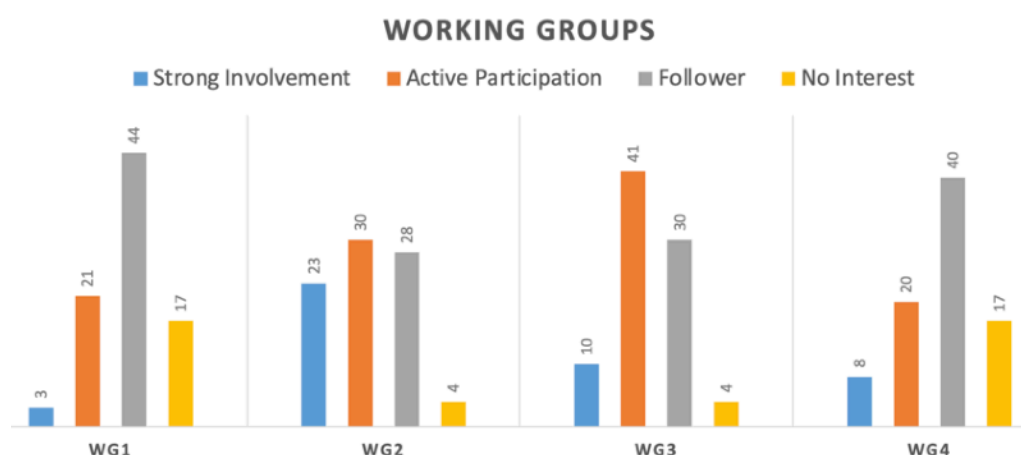
More details about STSM applications will be posted in our website: <https://www.newfocus-cost.eu/stsms-2/>



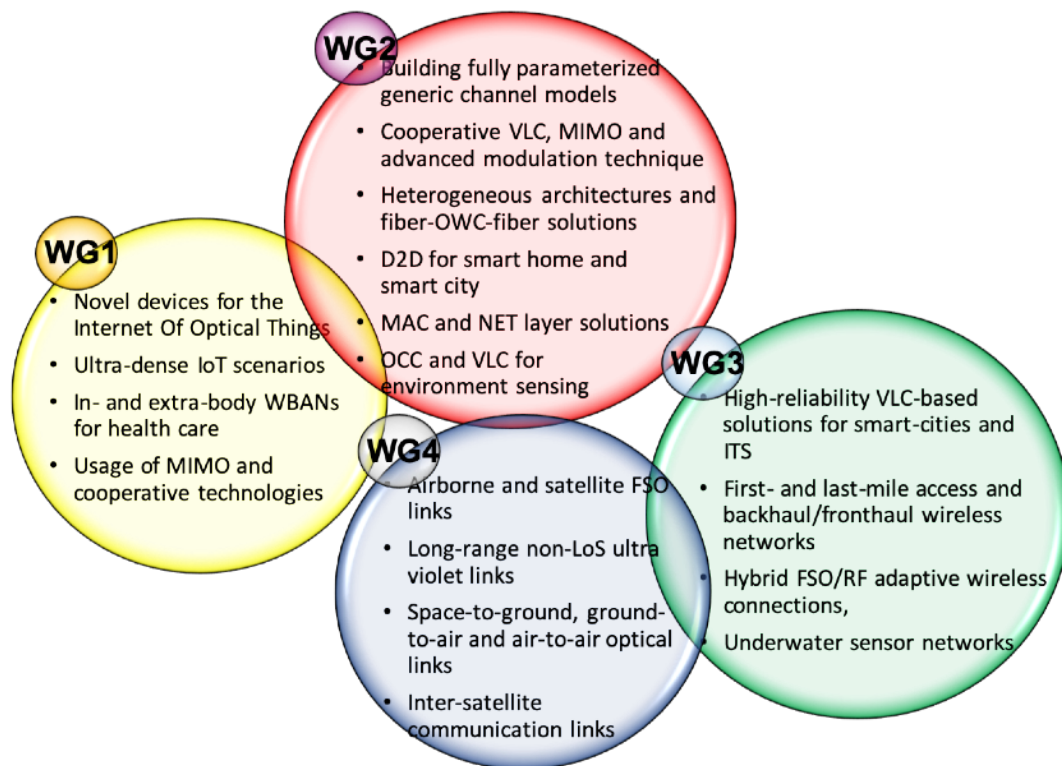
QR code linking to
COST Action STSM infos

Working Group organization

Each member of COST Action has selected one or more WGs to participate as *follower*, *active participation* and *strong involvement*. As depicted below, WG2 and WG3 are the most populated, while WG1 and WG4 present a very good number of contributors.



Each WG focuses on different aspects of OWCs, as highlighted in the following explicative picture:



WGs main research topics

NEWFOCUS Centers of Excellence

Centers of Excellence (CoE) will benefit from the visibility offered by NEWFOCUS Project. The following institutes have applied as possible CoEs:

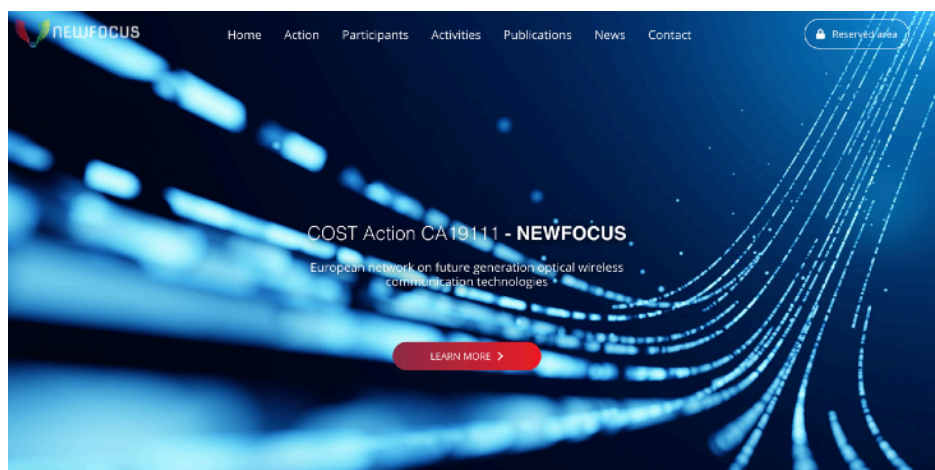


Collected pictures from NEWFOCUS Centers of Excellence

Name	Activity	Group leader	Key Facilities
Optical Communications Research Group (OCRG, Northumbria University, UK)	<ul style="list-style-type: none"> FSO, VLC, Radio frequency OCCs 	Prof. Z. Ghassemlooy	<ul style="list-style-type: none"> Indoor atmospheric chamber Fog/smoke and turbulence generators Traffic light High spec test and measurement up to 30 Gbps Precision Thermoelectric Temperature Controllers Cameras, Photodetector, Optical receiver, Optical power meter 3D printers, Circuit simulators, FPGA Boards OLEDs, Optics, Optical attenuators
SIX Research Centre (Brno University of Technology, Czech Republic)	Communication information and sensor technology	Dr. Lucie Hudcová, Dr. Peter Barčík	<ul style="list-style-type: none"> Athmopheric chamber Tunable Wavelength Laser Signal Quality Analyzer Laser Beamprofiler High Resolution Fiber Optic Spectrometer IR Fourier Spectrometer EDFA Fiber Amplifier Recorder Logoscreen
Wireless and Fiber Optics (Czech Technical University in Prague, Czech Republic)	FSO, VLC, Radio over optics, Optical fiber systems and sensors	Prof. Stanislav Zvanovec	<ul style="list-style-type: none"> 3 outdoor FSO links and 2 weather stations on roofs 6m turbulence chamber Fiber coupled 50-100m links Electrical and Optical oscilloscopes Signal generators Cameras, LEDs, Optical Sources, Amplifiers, Photodetectors Optical modulators, Spectral/Vector Analyzers, Optical collimators, Variable attenuator
OKATEM (Ozyegin University, Turkey)	Short and long range OWC	Prof. Murat Uysal	<ul style="list-style-type: none"> Athmospheric chamber XYZ Table (Pointing error) Goniophotometer (LED illumination pattern) Underwater tank of 8 m depth USRP and PXIs2 (Signal generation, waveform design)
Electronics and IoT (University of Agder, Norway)	Analogue and digital applications	Prof. Frank Young Li	<ul style="list-style-type: none"> Analogue and digital electronics
Fresnel Institute (France)	VLC, FSO, Underwater communication	Dr. Ali Khalighi	<ul style="list-style-type: none"> Water tank Electrical and digital oscilloscopes Signal generators BiasT LEDs Laser diode, Laser diode controller Photodetectors, MPPC

NEWFOCUS Website and Social Media

As anticipated, we finally have our new website <https://www.newfocus-cost.eu/> where news, updates, minutes of the meetings can be retrieved and shared among team members. Have a look at our website and leave a feedback!



NEWFOCUS COST Action website

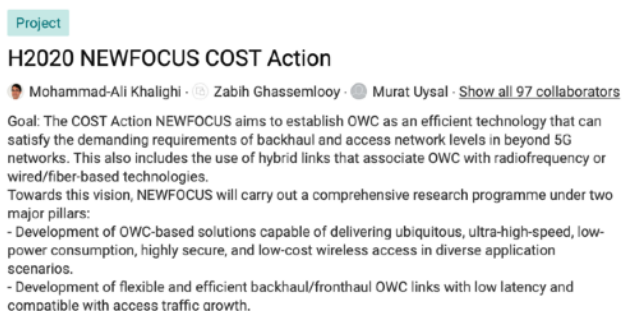
Other social media tools are also exploited to share results of our COST Action project, such as:

1. LinkedIn Group (<https://www.linkedin.com/groups/9035351/>)
2. ResearchGate Project (<https://www.researchgate.net/project/H2020-NEWFOCUS-COST-Action>)

Join our groups to get in touch and be updated on recent advances in the field of OWC!



LinkedIn NEWFOCUS group



ResearchGate NEWFOCUS project

P^{ublications}

Official joint publications should be co-authored by at least two members from different countries from COST network. COST publication will appear on the Action website as well as on the related social media webpages.

Also, the *1st White Paper of COST Action* is in progress. Lead by Prof. Ghassemlooy, Dr. Khalighi, Prof. Zvanovec and Prof. Stevens, it is scheduled by July 2021 and will focus on the role of OWC in 5G/6G network scenarios. Specifically, OWC technologies will play as such an enabling technology, including (i) free space optics; (ii) visible light communications; (iii) ultraviolet communications; (iv) optical camera communications; (v) hybrid OWC; (vi) hybrid RF/THz/OWC; and (vii) optical wireless networking with key feature of illumination, data communications, localization, sensing, and vision, and its application in a range of areas outlined in Pillar II of Horizon Europe, including:



Health



Intelligent
Transportation Systems



Culture, Creativity and
Inclusive Society



Virtual reality



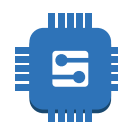
Agriculture and
Environment



Manufacturing



Unmanned Aerial
Vehicles



Internet of Things

N^{ews and events}

On Febr. 4-5, the University of Ljubljana organized the 25th Seminar on Optical Communications (<http://sok.fe.uni-lj.si>) with more than one hundred participants from 33 companies within

Slovenia. The annual event serves as a bridge between academia and industry, promoting the exchange of the latest advances in telecommunications technology and optical communications. This year, the greatest interest was in the presentation by *Prof. Ioannis Tomkos* from the University of Patras, who presented the evolution of fixed and wireless networks towards the sixth generation (6G).

Talk from the 25th Seminar on Optical
Communications

Call for papers

We have the following call for papers, which can be of interest for our COST Action members:

- Workshop on “Optical Wireless Technology for Enhanced Connectivity in 6G”, which will be jointly a part of IEEE PIMRC 2021 (13-16 Sept.). **Submission deadline: May 14, 2021**
- *1st NEWFOCUS Workshop* - The 5th International Workshop on Optical Wireless Communications (IWOW), to be held in conjunction with the 7th International Symposium on Wireless Communications, on 6-9 Sept. 2021, Berlin, Germany - <https://iswcs2021.org/>. **Submission deadline: May 21, 2021**



17th International Symposium on Wireless Communications (ISWCS 21)
6-9 Sep. 2021, Berlin, Germany
<https://iswcs2021.org/>

5th International Workshop on Optical Wireless Communications (IWOW)
Submission Deadline: 21 May 2021 via <https://iswcs2021.org/>
Decision: 7 July 2021; Camera Ready: 30 July 2021

The COST Action on European network on future generation optical wireless communication technologies (NEWFOCUS) aims to 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. As part of NEWFOCUS, we will be running the 5th International Workshop on OWC (started as a specialized forum with previous COST Action OPTICWISE IC1101) and focus on latest research and development in free space optics; networked bidirectional OWC (also known as UFi), visible light communications; ultraviolet communications; optical camera communications; hybrid OWC and RF systems; and OWC for a range of applications. Contributions are welcome in all areas related to OWC covering ultra-short, short-, medium-, and long-range links including:

- Photonic components and device
- Channel modelling and characterisation
- Coding, modulation, signal processing
- Physical layer design
- MIMO concepts for OWC
- MAC for e.g. OFDMA, NOMA, SDMA
- Overall system concept, modelling and simulations
- High-speed OWC systems (indoor and outdoor) for
 - inter-chip communications
 - office and homes
 - intelligent transportation systems, e.g., UAVs, high-speed trains
 - entertainment and advertisement
 - massive IoT, e.g., in medical, agriculture, manufacturing, etc.
 - underwater communications
 - space communications
 - Etc.
- Backbone network design for OWC
- Networking protocols
- Radio over OWC
- Hybrid WiFi/mmW/THz/OWC links
- Power line communications and OWC
- Optical camera communications
- Optical wireless localizations
- Optical wireless sensing (e.g., LIDAR)
- Security in OWC
- Machine learning in OWC
- Software defined OWC
- Emerging application areas and market perspective
- Others

Visit NEWFOCUS Website: <https://www.newfocus-cost.eu/>

Organizing Committee
Dr A Khalighi, Ecole Centrale Marseille, France
Prof Z Ghassemlooy, Northumbria Univ., UK
Priv-Doz Dr V Jungnickel, Fraunhofer HHI, Germany
Dr A-M Vegni, Università degli Studi Roma Tre, Italy
Prof S Zvanovec, Czech Technical Univ. in Prague, Czech Republic
Dr L Alves, Instituto de Telecomunicações, Portugal
Dr J Perez, Univ. de Valencia, Spain

For further information please contact: Professor Z Ghassemlooy, z.ghassemlooy@northumbria.ac.uk; and Dr J Perez, joaquin.perez-sojer@uv.es

NEWFOCUS

All accepted papers will be published in IEEE explore!

IWOW 2021 Call for Paper

Acknowledgement

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