TERAWAY

Terahertz technology

for ultra-broadband and ultra-wideband operation of backhaul and fronthaul links in systems with SDN management of network and radio resources

5G PPP
PUBLIC-PRIVATE PARTNERSHIP

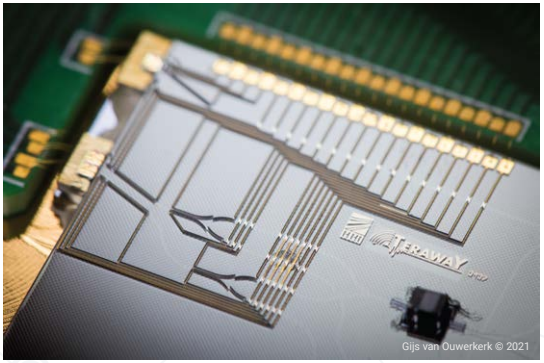
PHOTONICS 21
PHOTONICS PUBLIC PRIVATE PARTNERSHIP

TERAWAY project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under G.A No 871668 and it is an initiative of the Photonics Public Private Partnership.

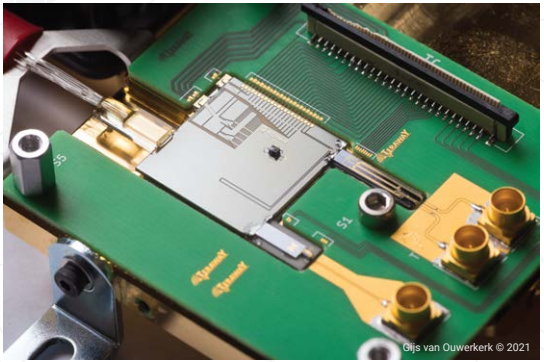
‘Towards the industrialization of THz wireless communication technology’

Vision

Aligned with the 5G/B5G vision for a fully mobile and connected society, TERAWAY is designed to address wireless networks’ challenging requirements imposed by 5G verticals and B5G/6G use cases i.e. ultra-high capacity, ultra-broad band connectivity, reliability and latency requirements exploiting Terahertz (THz) wireless communication technology and the abundance of bandwidth offered by carrier frequencies in the 300 GHz regime.



Gijs van Ouwerkerk © 2021


Gijs van Ouwerkerk © 2021

Project Objectives

Leveraging optical concepts and photonic integration techniques, TERAWAY designs and fabricates ground-breaking transceiver operating within an ultra-wide frequnecy band, covering the W- (92-114.5 GHz), D- (130-174.8 GHz) and THz- (252-22 GHz) bands.

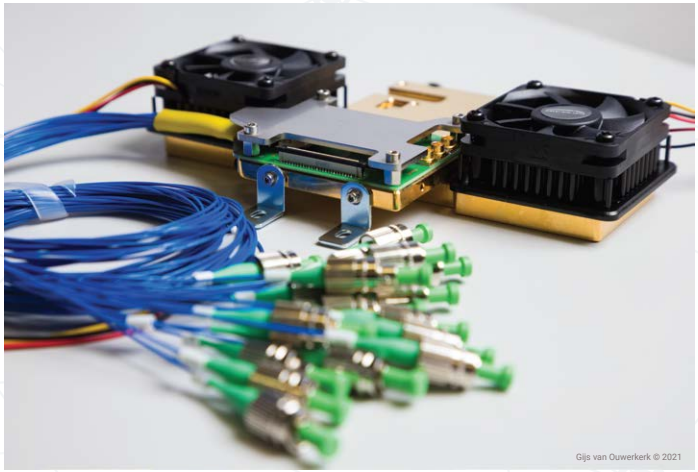
The employment of photonic technology enables the development of multi-channel transceivers with amplification of the wireless signals in the optical domain and with multi-beam optical beamforming capabilities.

In parallel, a new Software Defined Networking (SDN) controller and an extended control hierarchy is developed for the management of the network and radio resources in a unified manner, capable of providing network slices to support diversified services.

TERAWAY system will be integrated with a functional network and its capabilities and performance will evaluated in the framework of THz connectivity applications.

Achievements

- Fully-photonic THz wireless emitters and receivers fabricated and tested.
- First Baseband/Intermediate Frequency Unit.
- Real-time, error-free Sub-THz wireless link enabled purely by optoelectronics: 90-310 GHz seamless operation.
- SDN based controller integrating 3GPP compliant network and radio management functions.



Impact

TERAWAY is expected to have a substantial impact in the exploitation and usability of the THz band, by developing a technology base that will enable the thorough investigation of THz-transmission solutions and their incorporation into a meaningful system environment, establishing the conditions for their adoption by the **Next Generation communication networks**.

TERAWAY project aims at providing for the first time the possibility to arrange the spectral resources on a network within W/D/THz bands into a common pool of radio resources that can be flexibly coordinated and used for network connectivity.

TERAWAY at a glance

Project Title:	Terahertz technology for ultra-broadband and ultra-wideband operation of backhaul and fronthaul links in systems with SDN management of network and radio resources
Project Coordinator:	Institute of Communication and Computer Systems of the National Technical University of Athens (GR)
Starting Date:	1st November 2019
Partners:	Institute of Communication & Computer Systems (GR), Fraunhofer Institute for Telecommunications, Heinrich-Hertz Institute (DE), Universidad Carlos III de Madrid (ES), LioniX International BV (NL), Optagon Photonics (GR), Telefónica Investigación y Desarrollo (ES), The Ferdinand-Braun-Institut, Leibniz-Institut fuer Hoechstfrequenztechnik (DE), PHIX BV (NL), Intracom S.A. Telecom Solutions (GR), SIAE Microelettronica spa (IT), AALTO Korkeakoulusaatio SR (FI), Cumucore OY (FI)
GA no:	871668
Funding:	ICT-20-2019-2020 – 5G Long Term Evolution
EU contribution:	5 999 498.75 €

STAY TUNED!

TERAWAY Project @TERAWAY_EU https://ict-teraway.eu

Contact us:
Prof. Hercules Avramopoulos (Project Leader)
Photonics Communications Research Laboratory (PCRL) | www.photonics.ntua.gr
Institute of Communication and Computer Systems (ICCS) of the National Technical University of Athens, Greece