Objective

TERA6G aims at developing disruptive photonic wireless transceivers enabling Terabit-per-second data throughput capacity and massive Multiple-Input/Multiple-Output multi-antenna techniques operating in the millimeter-wave (30 GHz to 300 GHz) and Terahertz (300 GHz to 3 THz) bands of the spectrum, unlocking the “Fiber-over-the-Air” concept. The concept uses independently steerable wireless pencil-beams with fiber data throughput capacity, allowing mobile site connectivity scenarios in dense urban areas with macro/street level densification, temporal mobile site connectivity in ad-hoc networks, and connectivity to moving objects in public or private networks.
Hybrid photonic integration is the key enabler technology to develop a Blass-Matrix Transmitter and an incoherent-multi-band Receiver with key disruptive characteristics, including agility (handling any modulation scheme and continuous tuning of the carrier frequency across the target spectrum range), scalability (handling large number of beams with 2-dimensional antenna arrays for beamformed antenna gain >25 dBi and > 100º steering angles beam-steering) and reconfigurability (performing a variety of functions, from wireless data transmission, or radar ranging to channel sounding).

These disruptive wireless transceiver modules characteristics will be exploited at network level by developing the dynamic allocation of the network resources that these bring. We plan to dynamically analyze the position of the different wireless nodes and the channel resources using respectively the radar ranging and channel sounding techniques enabled by the novel reconfigurable TERA6G photonic transceivers. This will allow for novel scheduling methods capable of alternating paths to establish the connectivity, ensuring connection reliability, and considering energy consumption in the establishment of the wireless link.

TERA6G is the crossroad of previous H2020 projects TERAWAY, ARIADNE, TERRANOVA and FUDGE-5G.

Fields of science

- engineering and technology > materials engineering > fibers
- engineering and technology > electrical engineering, electronic engineering, information engineering > information engineering > telecommunications > radio technology > radar

Keywords

- Photonic-enabled THz communications
- tunable THz radio
- Millimeter-wave Radar
- THz channel Sounding
- Beam-forming
- Beam-steering and tracking
- multi-beam processing
- MIMO
- SDN controller integration

Programme(s)

- HORIZON.2.4 - Digital, Industry and Space

Topic(s)
Call for proposal

**HORIZON-JU-SNS-2022**

See other projects for this call

Funding Scheme

**HORIZON-JU-RIA - HORIZON JU Research and Innovation Actions**

Coordinator

**UNIVERSIDAD CARLOS III DE MADRID**

Net EU contribution

€ 634,631,25

Address

**Calle madrid 126**

28903 Getafe (madrid)

Spain

Region

Comunidad de Madrid > Comunidad de Madrid > Madrid

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation

Website

Participation in EU R&I programmes

HORIZON collaboration network

Other funding

€ 0,00

Participants (9)
EREVNITIKO PANEPISTIMIAKO INSTITOUTO SYSTIMATON EPIKOINONION KAI YPOLOGISTON

Greece

Net EU contribution
€ 634 375,00

Address
Patision 42
106 82 Athina

Region
Αττική > Αττική > Κεντρικός Τομέας Αθηνών

Activity type
Research Organisations

Links
Contact the organisation Website Participation in EU R&I programmes HORIZON collaboration network

Other funding
€ 0,00

FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV

Germany

Net EU contribution
€ 1 812 618,80

Address
Hansastrasse 27c
80686 Munchen

Region
Bayern > Oberbayern > München, Kreisfreie Stadt

Activity type
Research Organisations

Links
Contact the organisation Website Participation in EU R&I programmes
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<td>Netherlands</td>
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<td>De veldmaat 17 7522 NM Enschede</td>
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**Oost-Nederland > Overijssel > Twente**

**Activity type**

Private for-profit entities (excluding Higher or Secondary Education Establishments)

**Links**

- Contact the organisation
- Participation in EU R&I programmes
- HORIZON collaboration network

**Other funding**

€ 34 750,00

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**UNIVERSITY OF PIRAEUS RESEARCH CENTER**

Греция

**Net EU contribution**

€ 352 500,00

**Address**

Al. papanastasiou 91
185 33 Piraeus

**Region**

Αττική > Αττική > Πειραιάς

**Activity type**

Higher or Secondary Education Establishments

**Links**

- Contact the organisation
- Website
- Participation in EU R&I programmes
- HORIZON collaboration network

**Other funding**

€ 0,00

---

**OUULUN YLIOPISTO**

Финляндия

**Net EU contribution**

€ 469 500,00

**Address**
### CUMUCORE OY

**Address**

Gustav pauliginkatu 10 a 13
00990 Helsinki

**SME**

Yes

**Region**

Manner-Suomi > Helsinki-Uusimaa

**Activity type**

Private for-profit entities (excluding Higher or Secondary Education Establishments)

**Net EU contribution**

€ 400,500,00

**Other funding**

€ 44,500

### INTRACOM SINGLE MEMBER S.A. TELECOM SOLUTIONS

**Address**

Pentti kaiteran katu 1
90014 Oulu

**Region**

Manner-Suomi > Pohjois- ja Itä-Suomi > Pohjois-Pohjanmaa

**Activity type**

Higher or Secondary Education Establishments

**Net EU contribution**

€ 0,00

**Other funding**

€ 0,00
**Greece**

Net EU contribution

€ 391 500,00

Address

New road peania markopoulo 19 7km
190 02 Peania

Region

Αττική > Αττική > Ανατολική Αττική

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

Contact the organisation  
Website  
Participation in EU R&I programmes  
HORIZON collaboration network

Other funding

€ 43 500,00

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**TELEFONICA INVESTIGACION Y DESARROLLO SA**

Spain

Net EU contribution

€ 339 975,00

Address

Ronda de la comunicacion s/n distrito c edificio oeste i
28050 Madrid

Region

Comunidad de Madrid > Comunidad de Madrid > Madrid

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

Contact the organisation  
Website  
Participation in EU R&I programmes  
HORIZON collaboration network

Other funding

€ 37 775,00

Last update: 25 November 2022