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## Welcome to the second edition of the TWEETHER newsletter!

TWEETHER is a European research initiative, funded under H2020, that brings together world-leading European industries and academic institutions across Europe to set a milestone in the millimetre wave technology with the realization of the first W-band (92-95GHz) wireless system for distribution of high speed internet everywhere.

To enable this new network paradigm, the TWEETHER consortium is simultaneously addressing a number of formidable challenges such as the W-band operation, power amplification to overcome the atmosphere attenuation, synchronisation issues, novel W-band MMIC integrated circuits, deployment scenario, low cost approach, and the bridging of a niche technology to a mass production.

Through the second issue of this newsletter, we bring you updates about the project activities and progress, as well as news of events in which TWEETHER will participate.

More information is available on the project website: [www.tweether.eu](http://www.tweether.eu)

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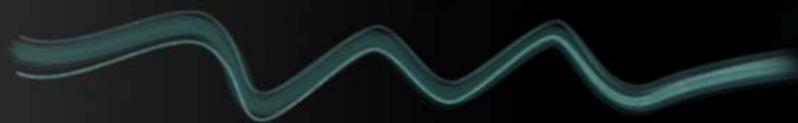


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## New Consortium

We are happy to announce our new TWEETHER consortium members: Bowen and Telecom ParisTech.

**BOWEN** **BOWEN** joined the TWEETHER consortium with its expertise in the area of equipment design and manufacturing of professional assemblies for Defence, Security, Maritime and Transport. BOWEN is recognized by its customer-partners as a company with a strong added value in embedded complex industrial electronics so that it will provide relevant competencies for the TWEETHER terminal (compactness, performances and quality).



**Telecom ParisTech (TPT)** joined the TWEETHER consortium with its expertise in the area of millimetre wave devices. Telecom ParisTech is one of the top French public institutions of higher education and research (Grandes Écoles) of engineering in France. TPT brings top international level expertise in the design, simulation and measurements of millimetre wave antennas; indeed, TPT has a mm-wave anechoic chamber. In the project, TPT will design, simulate and measure the specific components set: antennas, synthesiser and filter.

In addition, TWEETHER will count with the participation of When-ab as an associated contributor.



**When-ab** is a research company on HetNets and microwaves, which is involved in several telecommunication programs with partners as Telecom ParisTech, Thales, Alcatel and Orange-lab and moreover is consultant for the French “plan de souveraineté en télécommunication 5G”.

## Main technological achievements

TWEETHER just completed its first year, achieving the following technological goals:

- » The backhaul network architecture at W-band that will foster high density mobile networks as 5G and fixed access was defined. In particular, TWEETHER is proposing an end to end sub-network based on a point to multipoint (PmP) wireless distribution network providing up to 10Gbps/km<sup>2</sup>, whose range and capacity are mainly supported by a Traveling wave Tube (TWT) of 40 Watts and a W-band GaAs chip set.
- » The specifications of the TWEETHER system and its components were determined based on future capacity needs according to operators such as Everything Everywhere.
- » Models for scenario analysis and optimization were developed. These models computed the optimal dimensioning of the backhaul at W-band, including a wide range of constraints and satisfying the operators needs for an effective coverage of given areas.
- » The design of the first TWT, including the interaction structure, the electron gun, the collector, the magnetic focusing system and the windows, was completed.
- » Evaluation of the first chipset working at W-band was initiated and a new process was developed to design and fabricate the power amplifier for the terminal with 23dBm output power.

## Dissemination

### Conference papers and workshop presentations:

- » TWEETHER participated at the International Vacuum Electronics Conference (IVEC2015) presenting the potential of using W-band wireless system for high data rate communications and the millimetre-wave technology that will be developed in the project.
- » TWEETHER was invited to participate to the Special Session “5G scenarios and use cases: how new mmWaves technologies can lead to an immersive user experience” organized at the European Conference on Networks and Communications (EUCNC2015) by MiWaveS project.
- » TWEETHER project was invited to participate in the annual RF MST Cluster Meeting (co-organized by the European Commission), which took place on 1st July 2015 in Barcelona, Spain.
- » The TWEETHER Coordinator, Prof. Claudio Paoloni, presented the potential of using W-band access and backhaul solutions for high capacity wireless networks at the “New Spectrum, antennae & Microwave Technologies” Session in the Layer 123 Packet Microwave & Mobile Backhaul 2015 conference.
- » TWEETHER participated at the Workshop on Millimetre-wave Technologies for High-Speed Broadband Wireless Networks (mmW) with a presentation about the use of mm-wave for future 5G and a presentation of the main challenges to be overcome to enable a PmP network at mm-wave.

## Workshop on Millimetre-wave Technologies for High-Speed Broadband Wireless Networks

The Workshop on **Millimetre-wave Technologies for High-Speed Broadband Wireless Networks (mmW)**, was organized in the frame of TWEETHER and hosted by the Nanophotonics Technology Center of the Universitat Politècnica de Valencia.

The mmW workshop brought together academic researchers and industrial representatives across Europe to discuss technical challenges and recent achievements in this technical field. Along this line, the workshop gathered nine European projects from the FP7 and H2020 Framework Programmes, focusing on millimetre wave technologies for future wireless networks, to promote exchanges as well as synergies between projects. In particular, the projects participating in this event were: FP7-E3Network, FP7-MiWaveS, FP7-MiWEBA, FP7-SARABAND, H2020-TWEETHER, H2020-mmMAGIC, H2020-METIS II, H2020-5G Crosshaul, and H2020-5G Xhaul.

Moreover, the workshop included the participation of the new ETSI’s millimetre Wave Transmission (mWT) Industry Specification Group to gain insight into the activities carried out in this working group and a panel discussion about the potential of millimetre wave communications for 5G systems.

More information about this event can be found at:

<http://tweether.eu/workshop/index.php>

In addition, the presentations can be downloaded from the workshop website.





## Save the date

### TWEETHER AT THE FP7 AND H2020 NETWORK TECHNOLOGIES CONCERTATION DAY

In the context of the FP7 and H2020 network Technologies Concertation Day in Brussels on March 1st, the European Commission is organizing a Radio Access and Spectrum (RAS) cluster session to present project updates, identify opportunities for cross-project collaborations and discuss the future of the RAS cluster in H2020.

TWEETHER has been invited to participate to this Cluster Session to present the main research challenges and results obtained so far.



This Special Session will take place on 30th June 2015 in Paris, France.

### TWEETHER AT EUCAP 2016

The European Conference on Antennas and Propagation (EuCAP), owned by the European Association on Antennas and Propagation (EurAAP), is supported by top level world-wide associations on Antennas and Propagation, and provides a forum on the major challenges faced by these communities.



TWEETHER project will participate in the industrial workshop “Key enabling technologies on antenna and channel models for an effective mmWave 5G deployment” organized at the EuCAP2016, which will take place in April in Davos, Switzerland.

More information: <http://www.eucap.org/>

### TWEETHER AT IVEC 2016

The 17<sup>th</sup> edition of the International Vacuum Electronics Conference (IVEC 2016) will be held on 19-21 April 2016 in Monterey, California. With technical co-sponsorship from the IEEE Electron Devices Society (EDS), the conference will provide a forum for scientists and engineers from around the globe to present the latest developments in vacuum electronics technology at frequencies ranging from the UHF to THz frequency bands.



TWEETHER project will participate in this edition, which will take place in April in Monterey, US.

More information: <http://ivec2016.org/>



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