

CELTIC Proposers Day

in Vienna on 30.01.26

- Business Impact Session -



6G-SKY: 6G for Connected Sky



Christian Raffelsberger
Lakeside Labs GmbH

www.celticnext.eu





6G-SKY: Overview

Key Information:

- Duration:** 05/2022 – 08/2025
- Budget:** 8852.5 K€
- Effort:** 59.35 PY

Project Websites:

www.6g-sky.net

<https://www.linkedin.com/in/6g-sky>

www.celticnext.eu/project-6g-sky

Coordinator

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Airbus Defence and Space

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Technical Coordinators

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Dr. Mustafa Ozger

KTH Royal Institute of Technology

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Supported by:

6G-SKY: Partners

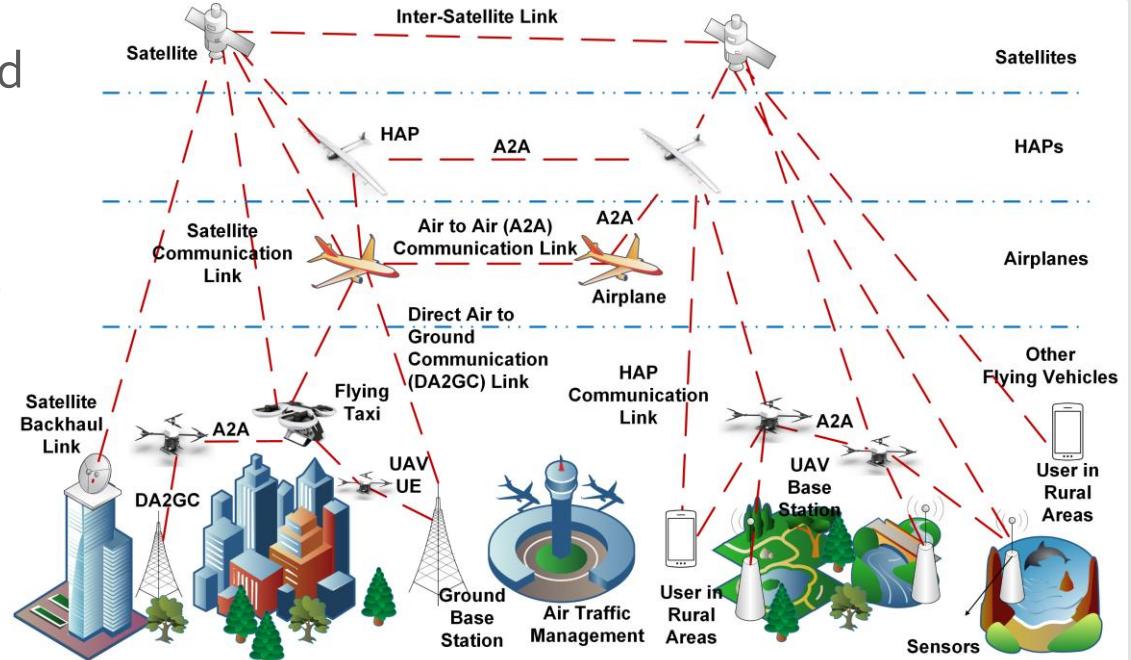


15 partners from Austria, Germany, Hungary and Sweden

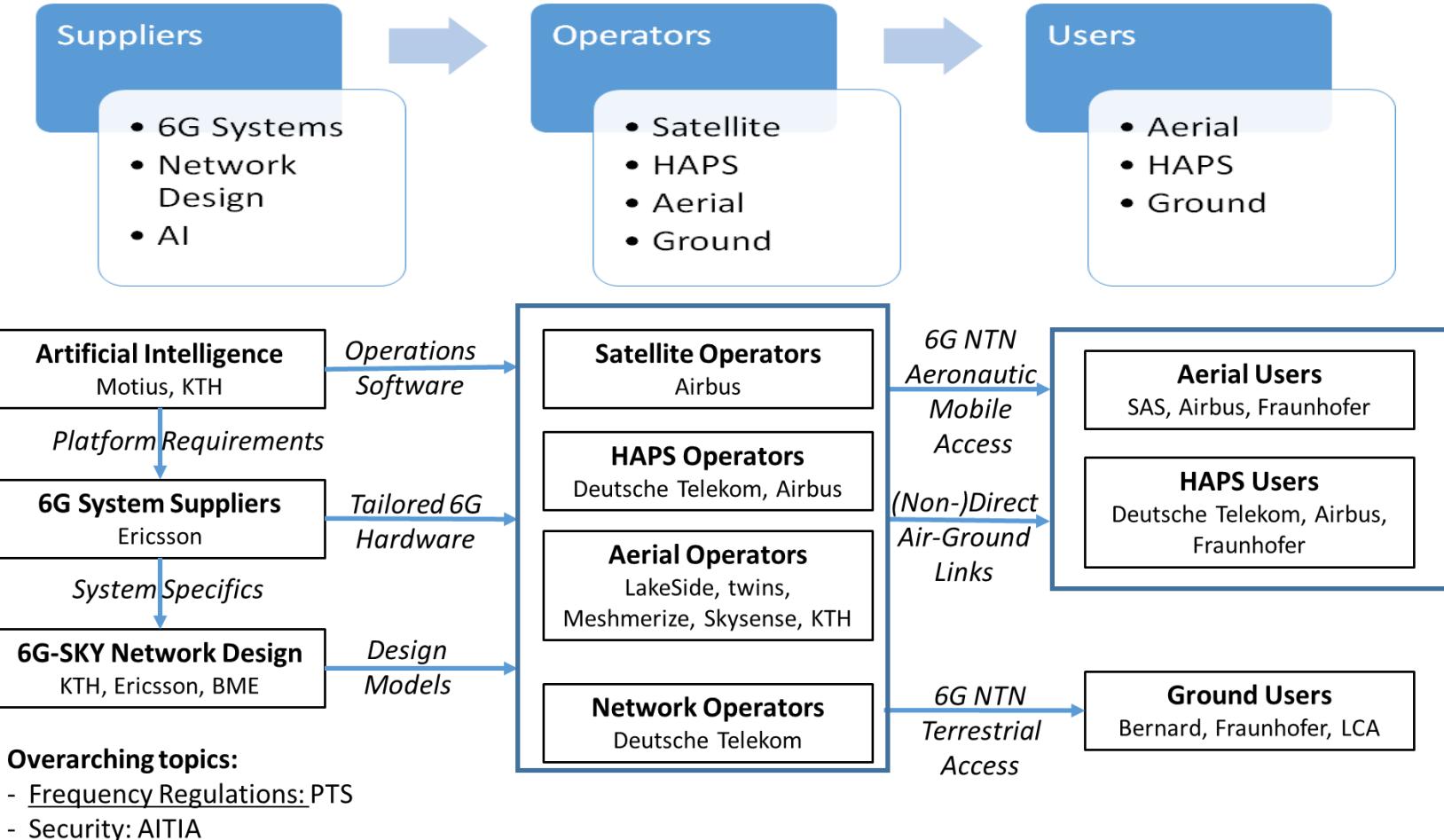
6G-SKY: Objectives

- Reliable and robust connectivity for aerial and ground users
- Novel wireless network design and management schemes in 3D-space for aerial users
- Differentiated connectivity services (robust, low latency, and high capacity)

Extension to combined Airspace and Non-Terrestrial Networks (ASN)
A novel approach!



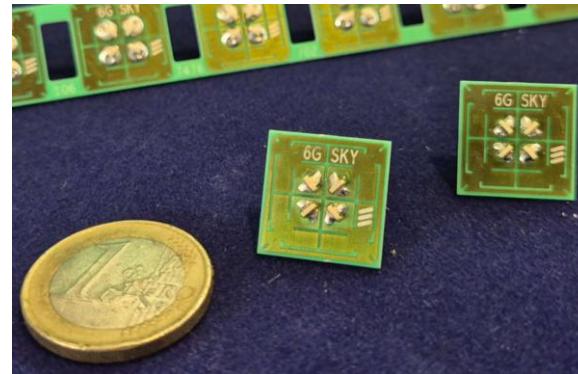
6G-SKY: Value chain and added value of collaboration



Further new **cross-domain industry-academia collaborations**,
promoting continued satellite–telco integration at both national and
European levels (incl. 3D-NET CELTIC NEXT)

6G-SKY: Impact

Category	Description	Involved Partners
Prototype Development	Scalable ultra-large antenna array with 768 compact PCB dipole elements (6400–8400 MHz).	Ericsson EAG
Product Innovation	3D localization of non-cooperative UAVs via Time Difference of Arrival.	Skysense AB

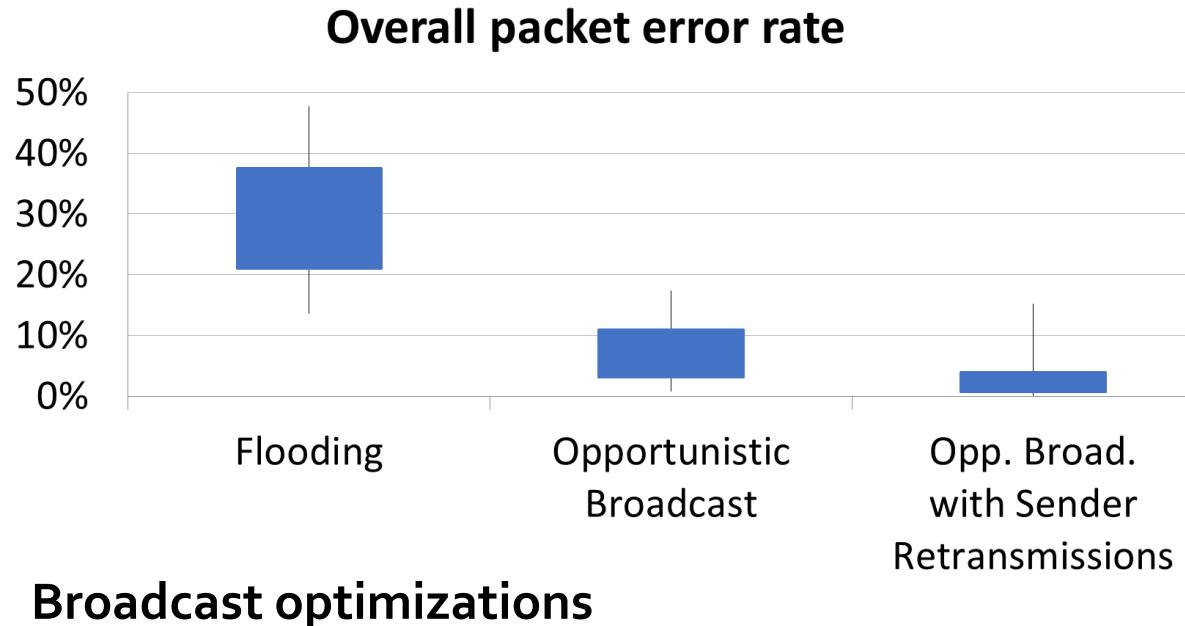


Antenna prototype



Drone sensor

Category	Description	Involved Partners
Product Enhancement	Meshmerize mesh network includes project-developed broadcast optimizations.	Meshmerize
Standards Contribution	Provided KPI input to 3GPP TSG-SA WG1 Meeting for the technical report on "6G use cases for verticals."	Airbus, Deutsche Telekom, Ericsson, Fraunhofer IIS,



3GPP TSG-SA WG1 Meeting #109
Athens, Greece 17-21 February 2025
(Revision of 51-250984)

Title: Use cases on high-rate aircraft communication services in 6G
Agenda Item: 8.1.7
Source: Airbus, Deutsche Telekom, Ericsson, Fraunhofer IIS (TBD)
Contact: amine.bouabendir@airbus.com joseantonio.del_poral_rosado@airbus.com

Abstract: This document proposes use cases on aircraft communication services in 6G, extending 3GPP TR 22.887

First Change

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document

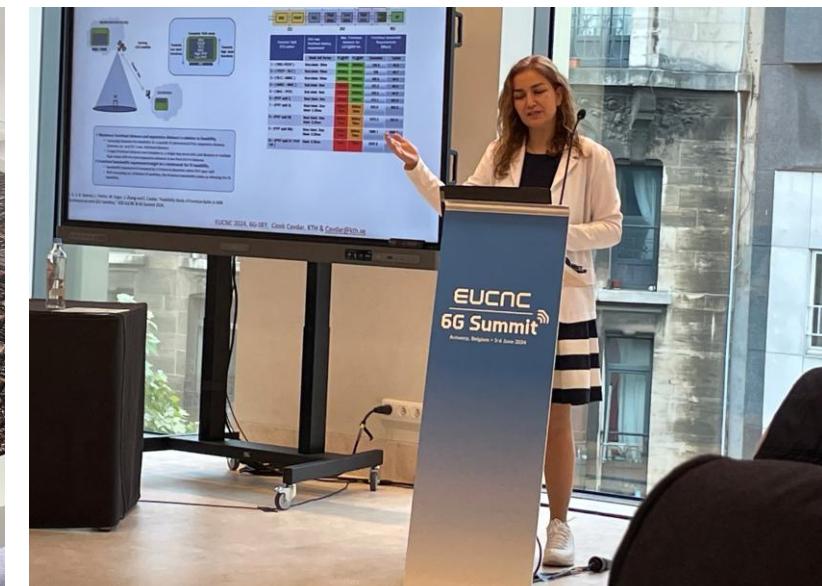
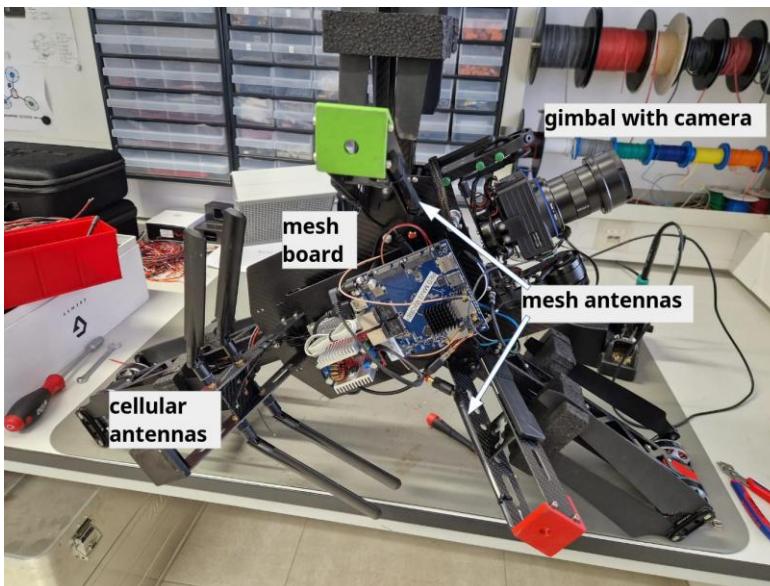
- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific
- For a specific reference, subsequent revisions do not apply
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a Release), a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document

Editor's Note: all references numbers to be corrected, missing references to be added

[1] 3GPP TR 21.905, "Vocabulary for 5G Specifications"
[2] QIAN,L et al. "5G Cloud-Native System: Vision, Challenges, Architecture Framework and Key Technologies" in IEEE Access, Received 19 August 2022, accepted 19 September 2022, Issue of IEEE Access, Volume 10, pp. 29438-29454, 2022
[3] GSMA, "Going green: Benchmarking the energy efficiency of mobile networks (Second edition)", Feb 2022
[4] 3GPP TR 32.972, "Study on system and functional aspects of energy efficiency in 5G networks"
[5] 3GPP TR 23.700-66, "Study on Energy Efficiency and Energy Saving"
[6] 3GPP TS 22.137, "Service requirements for Integrated Sensing and Communication; Stage 1"
[7] SOA: "SOA MRP input to 3GPP Stage 1 workshop on IMT 2030 Use Cases"
[8] SOA: Technical report "Evolution of vehicular communication systems beyond 5G"
[9] 3GPP TR 22.837, "Feasibility Study on Integrated Sensing and Communication"
[10] SAE J3016 202104, "Levels of Driving Automation"
[11] G. Lin, L. Ma, Y. Xue, et al. "SenseCAP: A Systematic Sensing Capability Performance Metric for 6G ISAC," IEEE Internet of Things Journal, vol. 11, no. 18, pp. 28438-28454, 2024
[12] Igol Bilek, Oren Lengman, Shahan Vitterli, and Joseph Tashjian, "The Rise of Radar for Autonomous Vehicles", IEEE signal processing magazine, Volume 34, Issue 5, September 2019.

3GPP contribution

Category	Description	Involved Partners
Prototype Enhancement	twinFOLD GEO drone platform upgraded (modular mounting system, better antenna configuration)	twins
Academic involvement	22+ Journal publications, 24+ Conference publications, 5 PhD, and 16 Master Theses	All consortium members

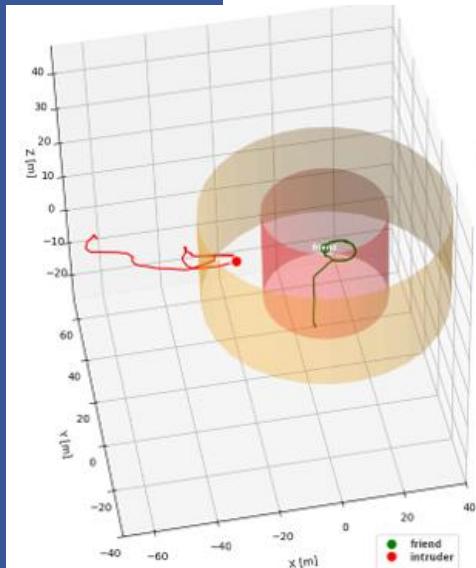


twins twinFOLD GEO prototype

twinFOLD KAT @MWC 24

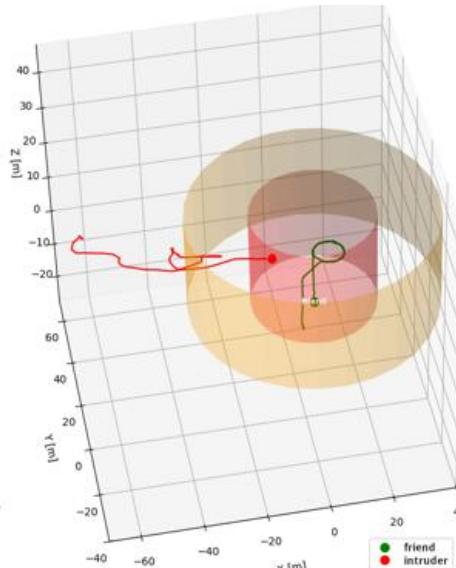
6G-SKY @ 6G Summit 24

6G-SKY: Field Trials and Demos



UAV sense and avoid

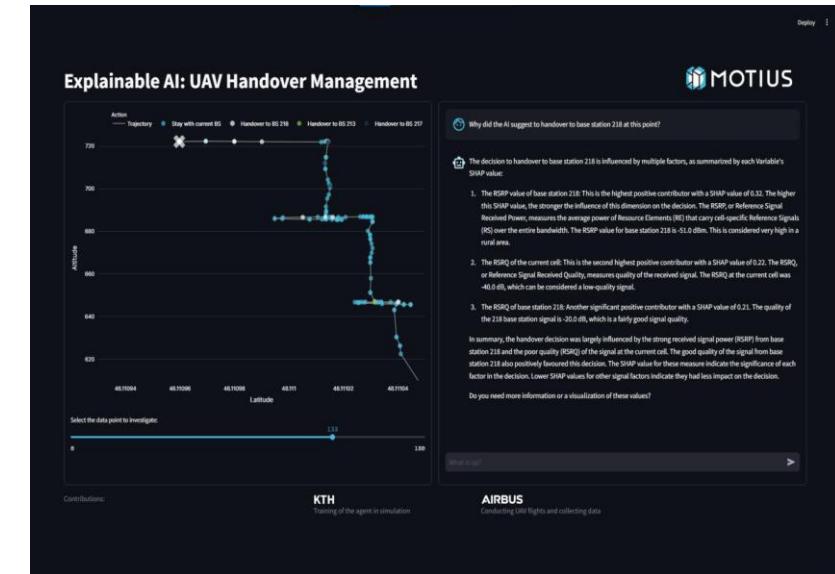
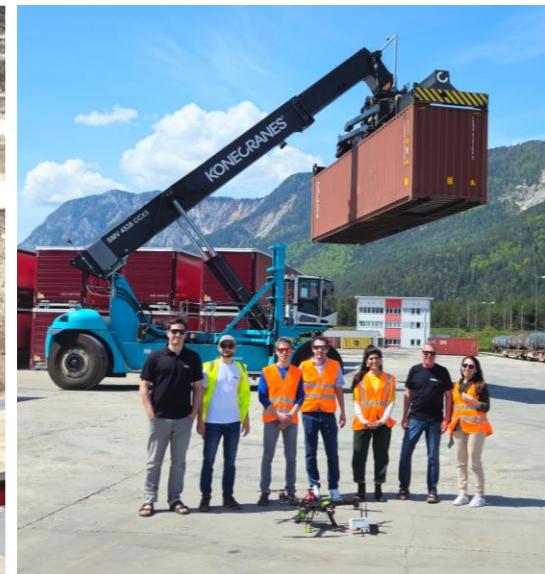
Category	Description	Involved Partners
UAV Safety	Final demo of UAV Sense and Avoid mechanisms in urban environments.	Skysense AB, Lakeside Labs, twins, Airbus
Multi-Tech Connectivity	Demonstration of seamless connectivity via TN/NTN payloads on drones, SDR base stations, and 7GHz radiators	Fraunhofer IIS, Ericsson EAG, Meshmerize, Lakeside Labs, KTH



TN/NTN Multi-tech demonstration



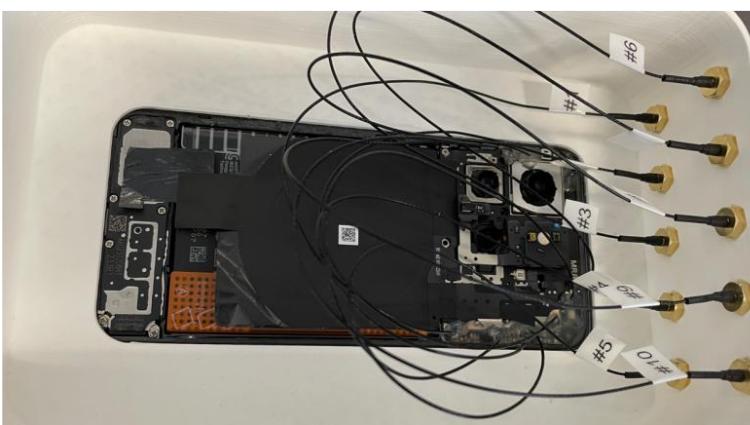
Category	Description	Involved Partners
Drone Swarms for Goods Mobility	Demonstration of drone swarms for identifying shipping containers	Lakeside Labs, twins, RED Bernard, LCA Sued, Meshmerize
Explainable AI	Live demo of AI-based UAV handover management	Motius, KTH, Airbus



Monitoring Logistics centre with a swarm of drones

Explainable AI for UAV handover management

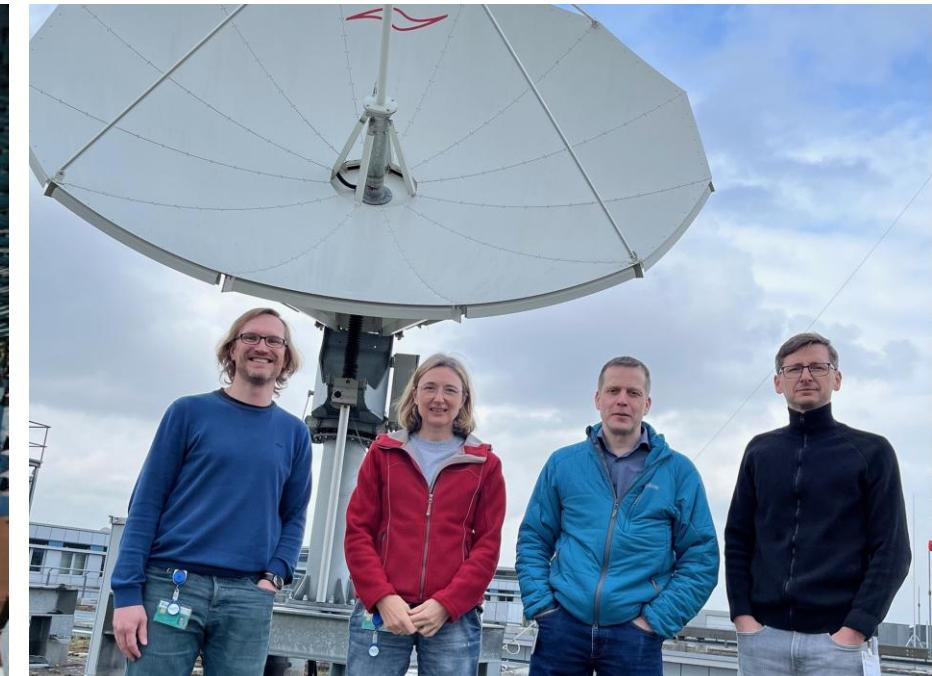
Category	Description	Involved Partners
HAPS Connectivity	Testing of High-Altitude Platform (HAP) payload to enable NTN connectivity.	Deutsche Telekom, Airbus, Fraunhofer IIS
Lab emulation	in-lab interoperability testing and validation	Fraunhofer IIS, Deutsche Telekom, Airbus, Meshmerize, Ericsson EAG, Lakeside Labs



Prototype for HAPS trials



Lab emulation and validation



3D-NET: 3D NETworks for 6G Mobile Communications Applications

Austrian 3D-NET project is funded by BMIMI and FFG

Federal Ministry
Innovation, Mobility
and Infrastructure
Republic of Austria



Key Information:

- **Duration:** 12/2025 – 11/2028
- **Budget:** 14043.45 K€
- **Effort:** 96.36 PY

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Project Website:

[https://www.celticnext.eu/
project-3d-net/](https://www.celticnext.eu/project-3d-net/)

3D-NET will leverage
outcomes from 6G-SKY

Project Key Information	Project Coordinator	Project Consortium
		Lakeside Labs , Austria
		Twins , Austria
		RED Bernard , Austria
		Royal Institute of Technology, KTH (Kungliga Tekniska Högskolan) , Sweden
		Effnet , Sweden
		VIAVI SE , Sweden
		Ovzon , Sweden
		Not yet active:
		Queen's University , Canada
		Xona , Canada
		Aalborg University , Denmark
		Airbus Defence and Space GmbH , Germany
		Fraunhofer Institut für Integrierte Schaltungen IIS , Germany
		Viavi Solutions Deutschland GmbH , Germany
		Deutsche Telekom AG , Germany
		Meshmerize GmbH , Germany
		DFKI (Deutsches Forschungszentrum für Künstliche Intelligenz) , Germany
		esc Aerospace (ESC) , Germany
		BISDN , Germany
		Giesecke+Devrient Mobile Security Germany (GD) , Germany
		HUN-REN Támogatott Kutatócsoportok Irodája (HUN-REN TKI) , Hungary
		LASZNOR , Hungary
		Turkcell İletişim Hizmetleri AS , Türkiye
		Turkcell Teknoloji , Türkiye
		Cranfield University , UK
		Honeywell , UK



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MANY THANKS FOR YOUR ATTENTION.

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