

CELTIC Proposers Day in Vienna on 30.01.26 - Business Impact Session –



6G-SKY: 6G for Connected Sky



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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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Supported by:



on the basis of a decision
by the German Bundestag



 Federal Ministry
Innovation, Mobility
and Infrastructure
Republic of Austria



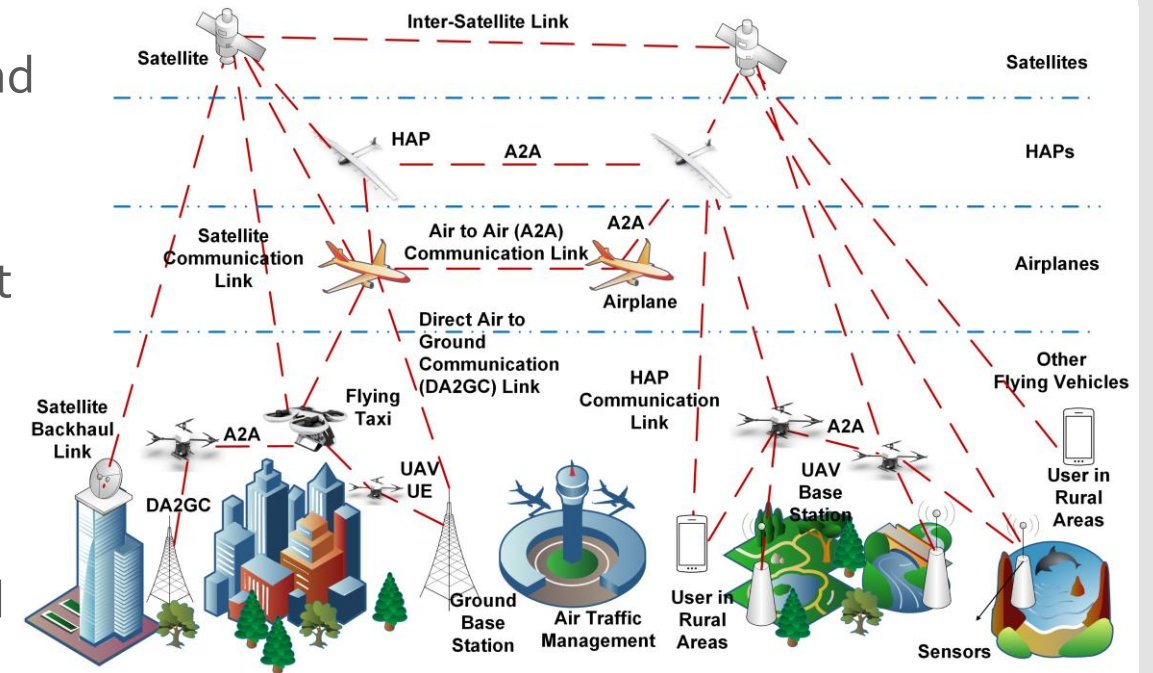
6G-SKY: Partners



15 partners from Austria, Germany, Hungary and Sweden

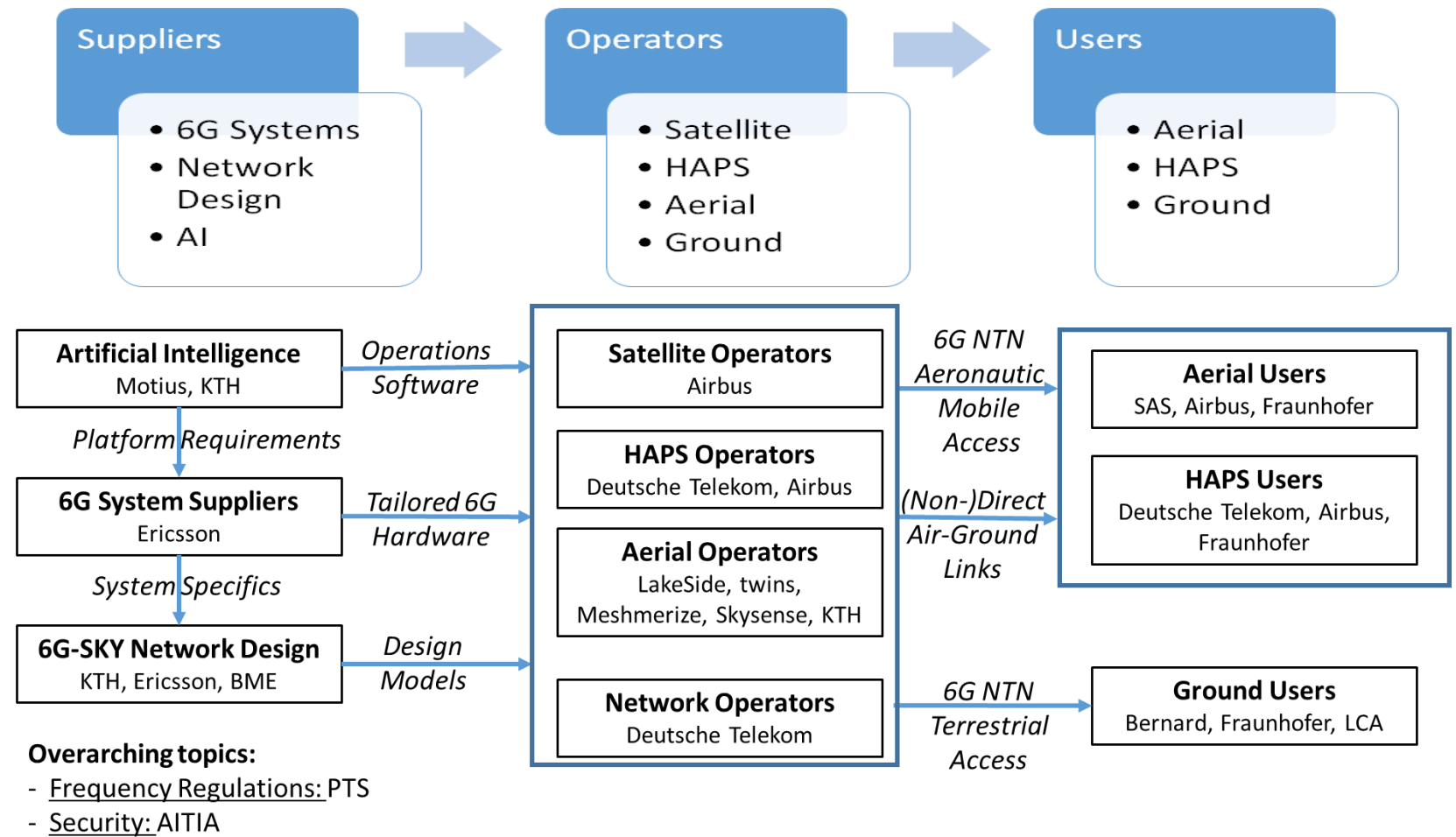
6G-SKY: Objectives

- 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

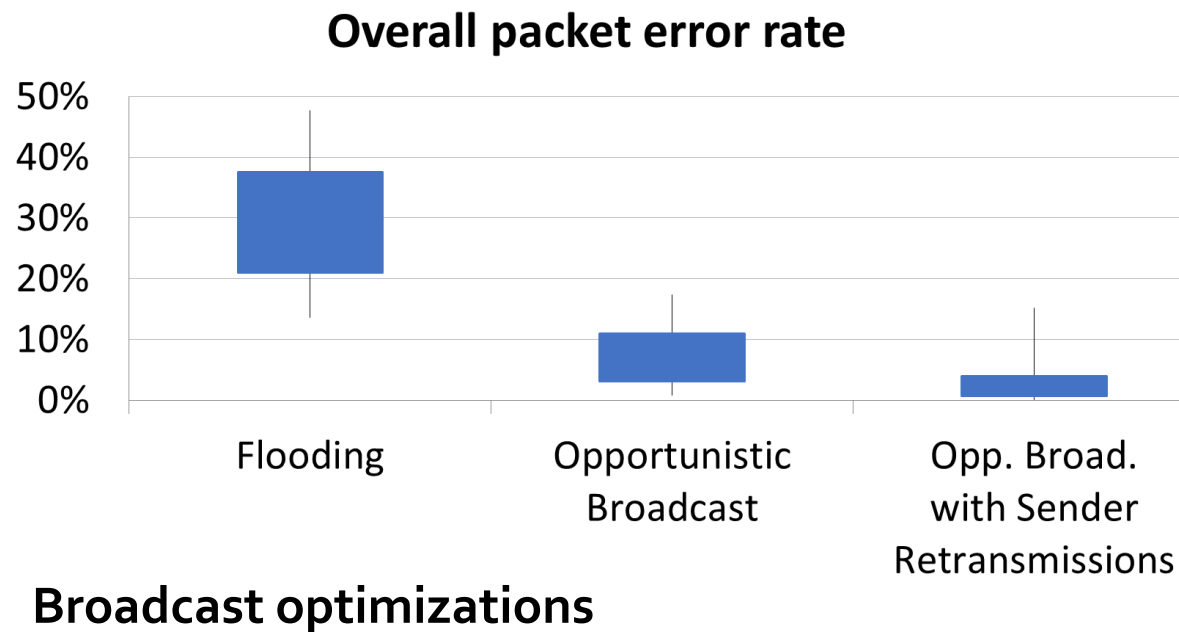


Antenna prototype



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 2022

S1-250973
(Revision of S1-250994)

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: amina.bouabdellah@airbus.com, jose_antonio.del_peral_rosado@airbus.com

Abstract: This document proposes use cases on aircraft communication services in 6G, extending 3GPP TR 22.807.

First Change

2 References

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

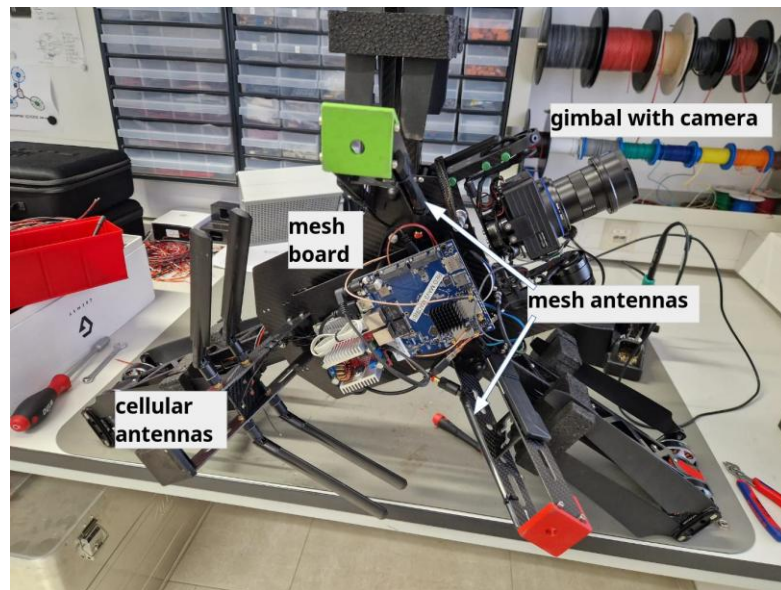
- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including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

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

- [1] 3GPP TR 22.805: "Introduction for 3GPP Specifications".
- [2] QUAN Li et al. "6G Cloud-Native Systems: Vision, Challenges, Architectural Framework and Enabling Technologies" in IEEE Access, Accepted 19 August 2022, accepted 1 September 2022, Date of publication 9 September 2022, date of current version 19 September 2022.
- [3] GSMA: "6G vision: benchmarking the energy efficiency of mobile networks (Second edition)", Feb 2023.
- [4] 3GPP TR 32.972: "Study on system and functional aspects of energy efficiency in 5G networks".
- [5] 3GPP TR 23.700-46: "Study on Energy Efficiency and Energy Saving".
- [6] 3GPP TS 22.137: "Service requirements for Integrated Sensing and Communication, Stage 1".
- [7] 3GAA: "3GAA MBP input to 3GPP Stage 1 workshop on IMT 2030 Use Cases".
- [8] 3GAA: "Technical report: Evolution of vehicular communication systems beyond 5G".
- [9] 3GPP TR 22.837: "Feasibility Study on Integrated Sensing and Communication".
- [10] SAE J3016 202004: "Levels of Driving Automation".
- [11] Q. Liu, L. Ma, Y. Xie, et al. "SenseCAP: A Systematic Sensing Capability Performance Metric for 6G ISAC", IEEE Internet of Things Journal, vol. 11, no. 18, pp. 28439–28454, 2024.
- [12] Igal Bilik, Oren Longman, Shlomo Villavet, and Joseph Teklehaimanot, "The Role of Radar for Autonomous Vehicles", IEEE signal processing magazine, Volume 36 Issue 1, September 2019.

3GPP contribution

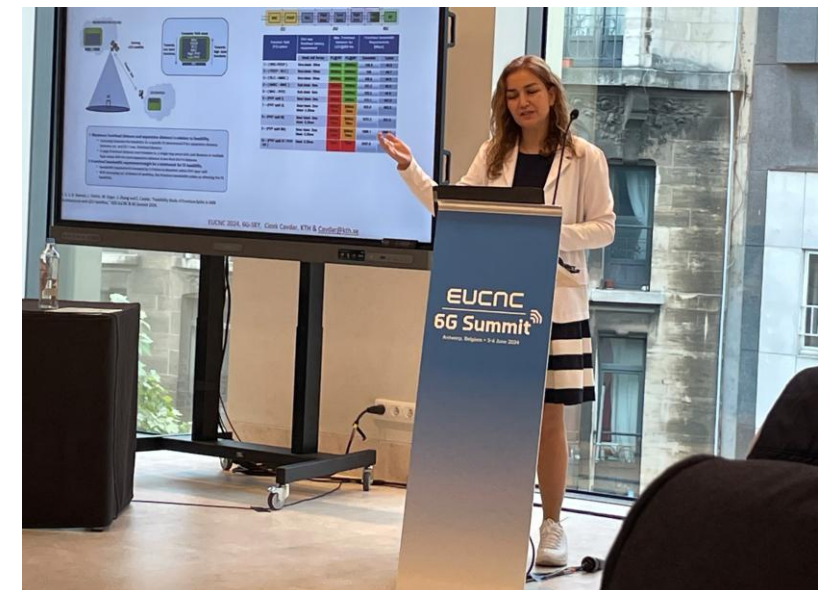
Category	Description	Involved Partners
Prototype Enhancement	twinFOLD GEO drone platform upgraded (modular mounting system, better antenna configuration)	twins
Academic involvement	22+ Journal publications, 24+ Conference publications, 5 PhD, and 16 Master Theses	All consortium members



twins twinFOLD GEO prototype



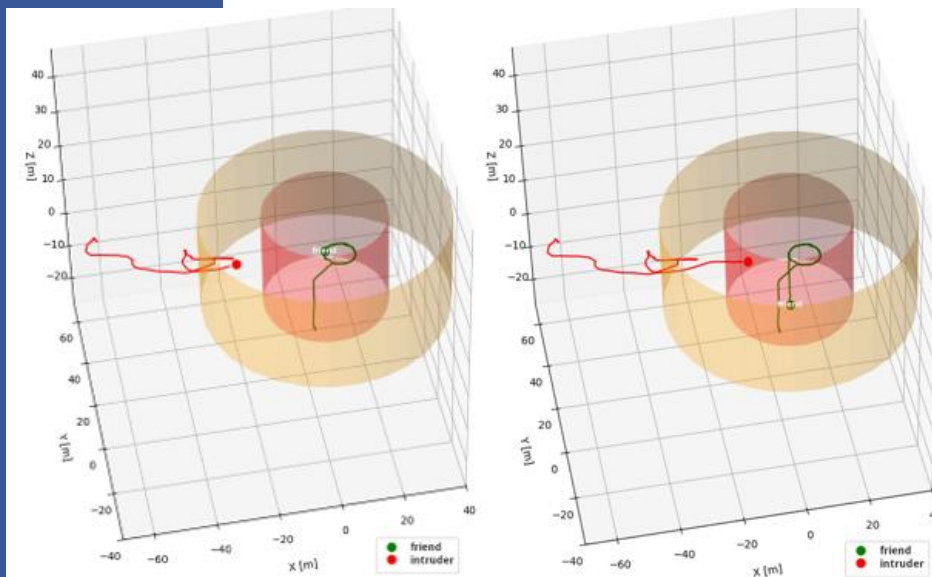
twinFOLD KAT @MWC 24



6G-SKY @ 6G Summit 24

6G-SKY: Field Trials and Demos

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

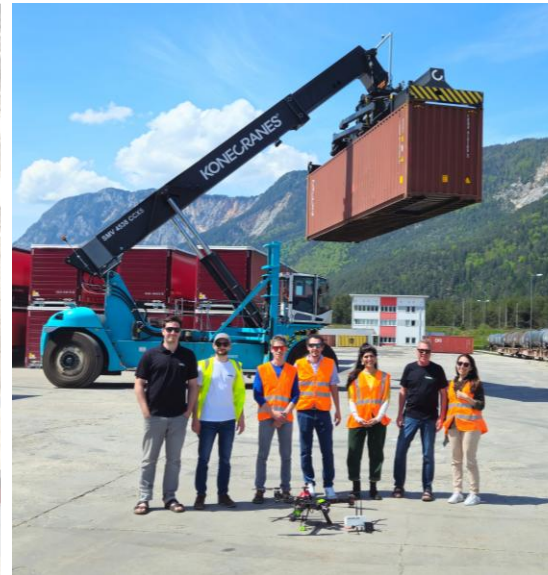


UAV sense and avoid

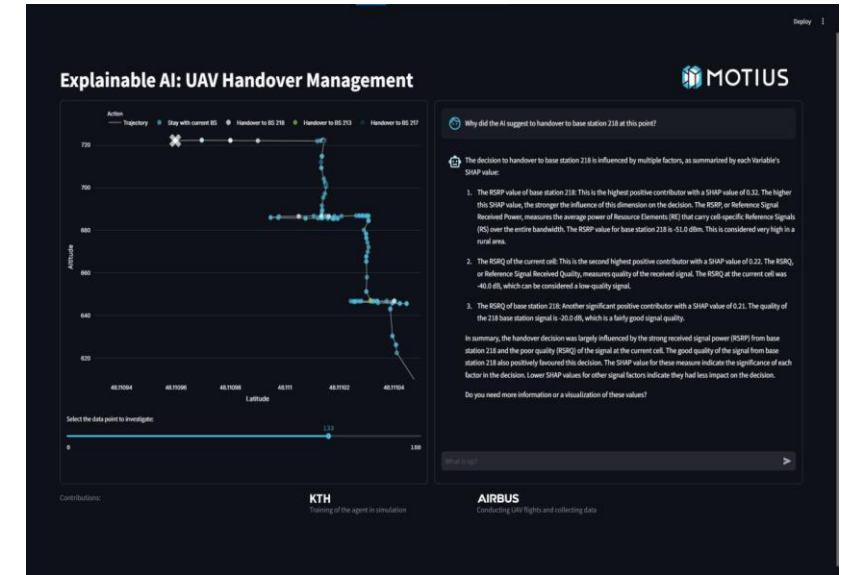


TN/NTN Multi-tech demonstration

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

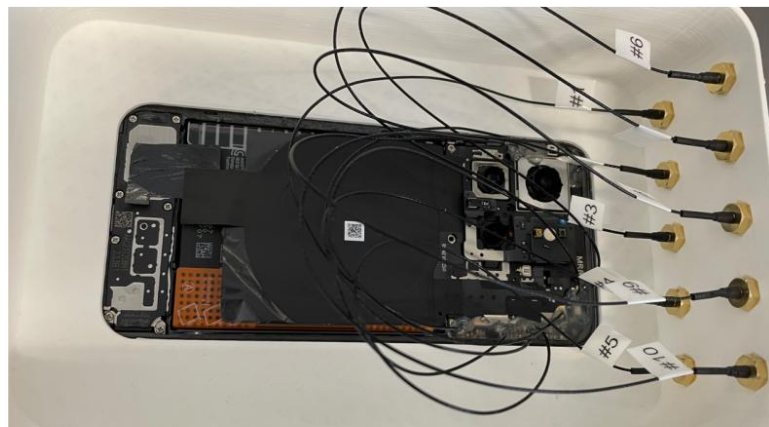
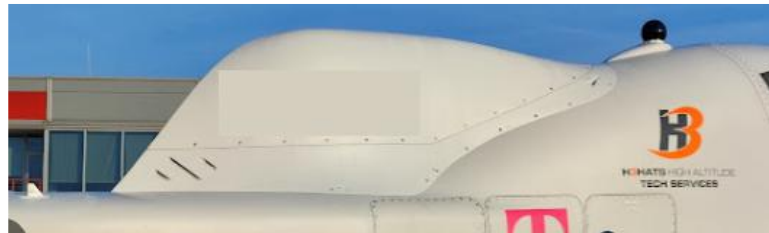


Monitoring Logistics centre with a swarm of drones

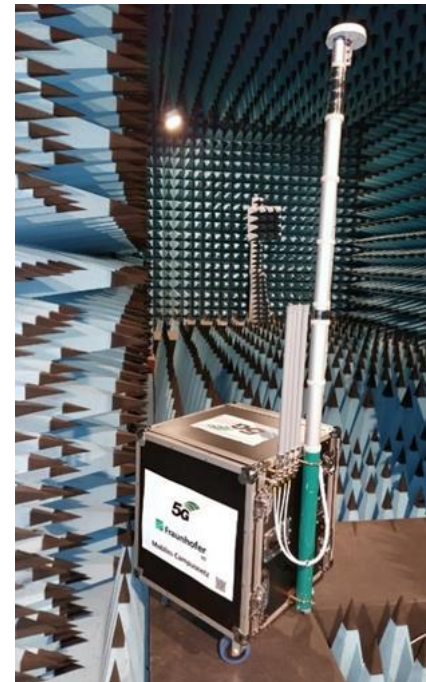


Explainable AI for UAV handover management

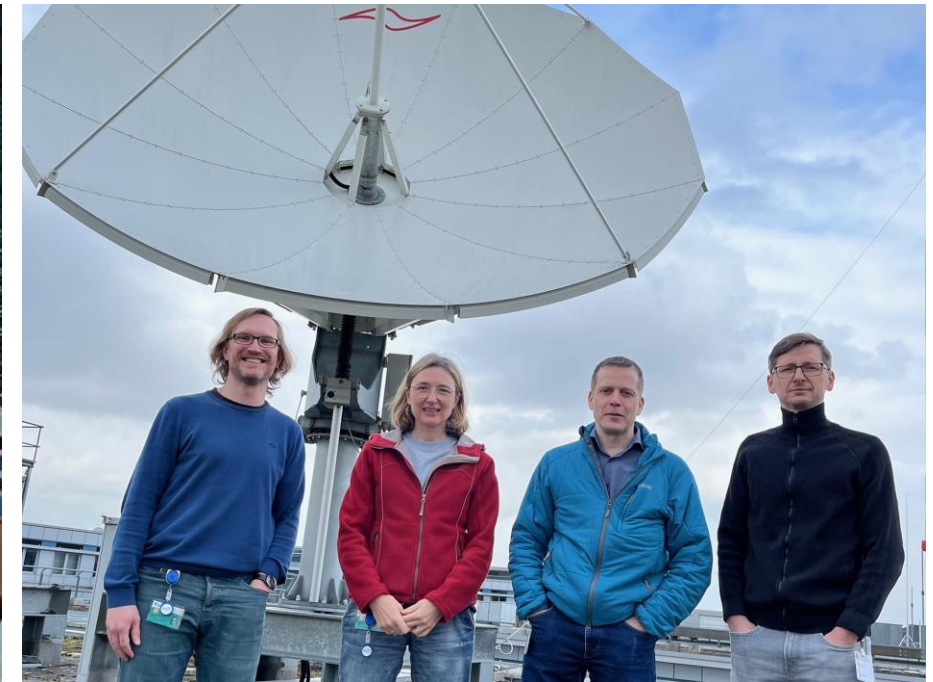
Category	Description	Involved Partners
HAPS Connectivity	Testing of High-Altitude Platform (HAP) payload to enable NTN connectivity.	Deutsche Telekom, Airbus, Fraunhofer IIS
Lab emulation	in-lab interoperability testing and validation	Fraunhofer IIS, Deutsche Telekom, Airbus, Meshmerize, Ericsson EAG,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



Prototype for HAPS trials



Lab emulation and validation



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

Key Information:

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

Coordinator

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Project Website:

<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.

CELTIC-NEXT



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