EU-Funded 6G-LEADER Project Kicks Off in Nicosia: Advancing AI-Driven, Sustainable 6G Networks

The 6G-LEADER project has officially launched with a successful Kick-Off Meeting at the University of Cyprus. The event marked the beginning of an ambitious journey towards advancing 6G technology through collaborative innovation, AI-driven wireless communications, and sustainable solutions.

The two-day KoM brought together nearly 40 participants representing 18 consortium partners, including leading European universities, research institutes, innovative SMEs, mobile operators, and global technology companies such as Nokia UK, Samsung Electronics UK, Telefónica, and Atos.

Ana Luísa Alves, 6G-LEADER Project Coordinator from the F6S Innovation, welcomed participants, emphasizing the project's commitment to achieving breakthroughs in wireless communication technology, aiming at significantly reducing energy consumption, enhancing spectral efficiency, and ensuring technological sovereignty for Europe.

> *"6G-LEADER is set to drive Europe's leadership in the global race for 6G by creating innovative solutions that are not only technically superior but also environmentally and economically sustainable,*
>
> *stated Ana Luísa Alves, Project Coordinator*

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The European Commission, under the SNS-JU (Smart Networks and Services Joint Undertaking), funds the project as part of the Horizon Europe Programme, highlighting its strategic significance for Europe's digital sovereignty and its role in shaping future telecommunications standards.

The project aims to develop AI/ML-driven, sustainable, and energy-efficient 6G networks over the next 36 months (January 2025 – December 2027). With a global budget of EUR 8.48 million, 6G-LEADER will focus on enhancing spectrum efficiency, automation, and semantic networking to meet future connectivity demands, ensuring Europe remains at the forefront of 6G technology development.

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The project will advance AI-powered Radio Access Networks (RAN), Open RAN architectures, and conflict-free network optimization, driving the evolution of 6G technologies. Key focus areas include AI/ML-enhanced 6G RAN for automation and adaptive resource allocation, advanced antennas for energy efficiency, semantic communication for intelligent data transmission, and Open RAN innovation for interoperability and real-time network control. The 6G-LEADER project will also focus on sustainability by incorporating energy-efficient solutions and reducing electromagnetic field (EMF) exposure in future 6G networks. The project's approach includes developing reconfigurable radio technologies and optimizing spectrum usage in the FR1 and FR3 frequency bands to enhance connectivity and capacity without requiring extensive infrastructure overhauls. Additionally, the project will introduce conflict management solutions within Open RAN environments, ensuring that AI-driven network optimization operates smoothly without interference between multiple control mechanisms.

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During the two-day Kick-Off Meeting, partners aligned on technical goals, collaborative strategies, and a roadmap for implementation. Key takeaways included the development of a technical framework for AI-driven PHY and RAN automation, a standardization roadmap for contributions to 3GPP and O-RAN Alliance, and plans for Proof-of-Concepts (PoCs) deployments to validate key technologies in real-world scenarios. During the Kick-Off Meeting, discussions covered the integration of AI/ML-driven decision-making into real-time network control through distributed applications (dApps), aiming to achieve sub-10ms latency for critical communications. The meeting also established a structured approach to the project's dissemination and exploitation activities, ensuring that research findings are translated into industry adoption and standardization contributions.

Furthermore, partners also explored collaboration opportunities with other SNS JU-funded projects to maximize synergies and contribute to the broader European 6G ecosystem. As part of Europe's strategic push to lead in next-generation wireless technology, 6G-LEADER is committed to developing future networks that are not only highly efficient and intelligent but also environmentally sustainable. By integrating AI/ML-driven automation, optimizing spectrum usage, and advancing Open RAN solutions, the project aims to create a secure, adaptable, and high-performance connectivity framework that meets the demands of future digital infrastructures.

The 6G-LEADER project brings together a diverse and multidisciplinary consortium of academic, research, and industry partners, each contributing their expertise to drive the development of AI-powered, sustainable 6G networks.

- **The Academic and Research partners** play a crucial role in advancing AI/ML-driven innovations, antenna technologies, and wireless communication systems. This group includes the University of Cyprus, which leads the project's technical coordination, alongside Aalto University, Universitat Politècnica de Catalunya, Linköping University, University of Granada, Universidad Carlos III de Madrid, Digital Catapult, CNIT, and ICCS. Their combined expertise ensures a strong foundation for innovative research and development.

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- **The Industry leaders and SMEs** bring deep experience in Open RAN solutions, AI-powered RAN development, and semantic networking, bridging the gap between research and real-world implementation. This group includes Nokia, Samsung, Telefónica, ATOS, Software Radio Systems (SRS), Accelleran, Massive Beams, and Four Dot Infinity, all working towards integrating novel 6G technologies into future networks.

- **F6S Innovation leads the Project Coordination**, overseeing management, dissemination, and stakeholder engagement to ensure the project achieves its objectives and delivers a lasting impact within the 6G ecosystem.

The 6G-LEADER project is a Horizon Europe SNS JU-funded initiative aimed at developing AI-driven, sustainable, and energy-efficient 6G networks. With a consortium of 18 leading academic, research, and industry partners, the project seeks to revolutionise wireless communication, ensuring Europe's leadership in 6G technology. Follow our journey!

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Department of Electrical and Computer Engineering

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Atos

UNIVERSIDAD DE GRANADA

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LINKÖPING UNIVERSITY

CATAPULT Digital

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