

Announcement Letter



LUMINA Launches to Advance Ultra-High-Bandwidth and Energy-Efficient Communication Technologies for Future Telecom Networks

September 2026

The Horizon Europe project LUMINA (Low power and Ultra-high bandwidth systems using innovative advanced Materials Integrated in next generation telecom Applications) has officially started on 1st September 2026, bringing together leading European industrial, research, and academic partners to develop a new generation of photonic and radiofrequency technologies for future communication networks. Coordinated by THALES Research & Technology (France), the four-year project aims to unlock ultra-fast, low-power communication systems through the integration of innovative advanced materials, including graphene and electro-optic polymers.

The rapid growth of data traffic driven by cloud computing, artificial intelligence, immersive digital services, and emerging 6G applications is placing increasing pressure on existing communications infrastructure. While performance demands continue to rise, network operators must also address growing energy consumption and sustainability challenges. LUMINA responds to these needs by developing breakthrough photonic devices and radiofrequency interfaces capable of delivering unprecedented bandwidth while significantly improving energy efficiency.

At the core of the project is the advancement of innovative photonic technologies based on graphene and electro-optic polymers, combined with dielectric waveguide interconnects and CMOS-compatible manufacturing approaches. Building on previous scientific achievements from consortium members, LUMINA will develop packaged demonstrator devices and validate them in relevant telecommunications environments. The project also aims to demonstrate record-breaking performance at frequencies up to 500 GHz, paving the way for future wireline and wireless communication systems.

Key innovations and objectives of LUMINA include:

- Development of ultra-high-speed photonic devices based on graphene and electro-optic polymer technologies.
- Demonstration of advanced optical modulators, photodetectors, and RF interfaces operating at frequencies up to 500 GHz.
- Integration of novel devices into CMOS-compatible and wafer-scale manufacturing processes.
- Advancement of low-loss silicon nitride photonic integration platforms suitable for large-volume production.
- Validation of innovative communication components in realistic telecom network environments.
- Strengthening European technological leadership and industrial competitiveness in next-generation photonics and telecommunications.

With a total budget of €4.81 million, fully funded through the Horizon Europe programme, LUMINA will run from September 2026 until August 2030. The consortium combines expertise in advanced materials, photonics, microelectronics, telecommunications, integration technologies, and industrial exploitation, creating a strong European ecosystem for innovation in future communication systems.

By bridging cutting-edge materials science with scalable industrial manufacturing, LUMINA aims to accelerate the transition towards faster, more sustainable, and more efficient communication networks, supporting Europe's ambitions in 6G, data center connectivity, and next-generation digital infrastructure.

About the Coordinator

THALES Research & Technology (TRT) is a global technology leader operating in the aerospace, defence, digital identity, security, and advanced communication sectors. Through its research and innovation activities in photonics, advanced materials, and telecommunications, TRT plays a key role in developing the technologies that will underpin future digital infrastructure and communication networks.

For more information about the LUMINA project, visit our website or contact the project coordinator:

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