

PROJECT: LUMINA

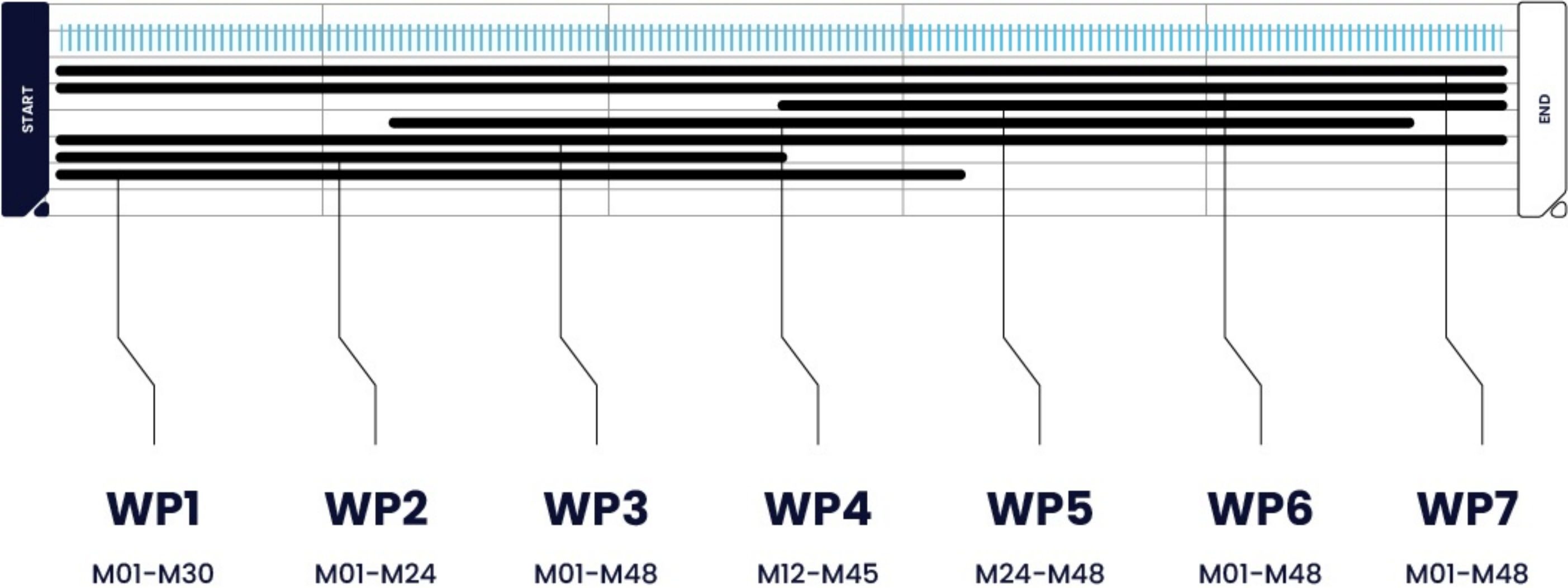
Low power and Ultra-high bandwidth systems using innovative
advanced Materials Integrated in next generation telecom Applications



2026



2030



Acronym: LUMINA
Project ID: 101298684
Start date: 01 September 2026
End date: 31 August 2030
Coordinated by: THALES

Budget: 4 814 297,50 €
(100% EU Funded)
Programme: Horizon Europe
(HORIZON)
Topic:
HORIZON-CL4-2025-03-MATERIALS-46



Starting now . . .

WP1 M01-M30	System definition and prototype design	
WP2 M01-M24	IAM-based component development	
WP3 M01-M48	Wafer-scale fabrication	
WP6 M01-M48	Project, Risk, and Innovation Management	
WP7 M01-M48	Communication, Dissemination, Exploitation and Standardisation	



2026



2030



WP1

M01-M30



System definition and
prototype design



WP2

M01-M24



IAM-based component
development



WP3

M01-M48



Wafer-scale
fabrication



WP4

M12-M45



Assembly and Packaging technologies
for IAM devices



WP5

M24-M48



System and prototypes characterisation
and demonstration



WP6

M01-M48



Project, Risk, and Innovation
Management



WP7

M01-M48



Communication, Dissemination,
Exploitation and Standardisation





System definition and prototype design

Objectives: WP1 will analyse use case scenarios to determine key system requirements and drive the overall design. It will define the high-level system architecture, specifications, and sub-systems, and translate these into detailed module designs, including individual component characteristics and required performance levels. This WP ensures that all subsequent development activities are aligned with the project's objectives and system-level targets (**OBJ 1-7**).

M01-M30



WP1

LEAD UC3M



WP2

LEAD ETH

IAM-based component development

Objectives: The objective of this work package is to develop and demonstrate the core IAM-based devices that underpin the sub-systems defined in WP1. We will design, fabricate, and characterize high-speed and low-loss modulators, graphene modulators and mixers, ultrafast graphene photodetectors, tuneable ring resonator filters, and broadband dielectric RF phase shifters. Their performance will be benchmarked against the state of the art and continuously fed back to WP1 to enable system-level integration (**OBJ 1-4**).

M01-M24



Wafer-scale fabrication

Objectives: Process development and fabrication of 3 main wafer runs for all the sub-systems. This includes all test substrates for WP2, including these for sample scale fabrication using Au plasmonics at ETH, and transitioning this technology to wafer scale CMOS-compatible Al plasmonics in WP3 (**OBJ 1, 3, 4**).

M01-M48 

LUMINA 

WP3

LEAD AMO





Assembly and Packaging technologies for IAM devices

Objectives: To develop the control electronics and the device's control algorithms. To integrate all the developed PICs (WP3) in an ESD-free, thermally controlled environment, ensuring stable operation. The final prototype will be able to operate in a relevant environment (**TRL6**) (**OBJ 6, 7**).

M12-M45 |||||



WP4

LEAD LW



WP5

LEAD UC3M

System and prototypes characterisation and demonstration

Objectives: This WP objectives are to offer feedback to the other WPs to ensure optimum performances in the last prototypes, and to demonstrate the project prototypes in TRL6 conditions (**OBJ 6, 7**).

M24-M48 |||||

LUMINA

Project, Risk, and Innovation Management

Objectives: WP6 is responsible for the operational management and technical vitality of the LUMINA project encompassing management tasks on contractual, financial, legal, technical, and administrative levels.

M01-M48 



WP6

LEAD TRT



Communication, Dissemination, Exploitation and Standardisation

Objectives: WP7 is dedicated to LUMINA's communication, dissemination, exploitation, and standardisation activities, ensuring that the project achieves maximum visibility, uptake, and long-term impact.

M01-M48 



WP7

LEAD TEC