CONSORTIUM

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NANOPHOTONICS TECHNOLOGY CENTER

UNIVERSITAT POLITÈCNICA DE VALÈNCIA

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PHOENIX

Ferroelectric PHOtonics ENablIng novel functionalities and enhanced performance of neXt generation PICs

ABOUT THE PROJECT

In PHOENIX, “Ferroelectric PHOtonics ENablIng novel functionalities and enhanced performance of neXt generation PICs”, funded by the EU Horizon Europe programme (GA 101070690), a consortium formed by Partners Lumiphase (CH), Optalysys (UK), IBM Research (CH and IL), Nanophotonics Technology Center - Universitat Politècnica de València (UPV) (ES), and PNO Innovation (Spain), coordinated by KU Leuven (KUL), will collaborate during the next 3 years to create building blocks for the next generation of encryption and computing hardware.

They will leverage compact photonic integrated circuits (PIC) offering a continuous and efficient control over optical signals. The PIC chips are based on Lumiphase’s proprietary technology, and enhanced with novel functionalities using materials developed at KUL and UPV. Epitaxial technology will be advanced through the realization and upscaling of high-quality oxide thin-films.

OBJECTIVES

The developed technology will be used to demonstrate its benefits in four high-impact emerging applications:

1. fully homomorphic encryption (Optalysys, IBM Research)
2. 5G infrastructure (Optalysys)
3. inference of deep neural networks (IBM Research), and
4. training of deep neural networks (IBM Research).

IMPACT

The validation of the developed technologies will be completed with an extrapolation to benchmark against representative existing systems and a roadmap for photonic-electronic integration. The project will perform a market analysis and a techno-economic evaluation to define business models and exploitation plans that ensure the sustainability of the PHOENIX platform to reduce innovation-to market-time and R&I costs for disruptive high-tech SMEs and maximize the impact of the 4 user cases demonstrators.