STARLight Project chosen as the European consortium to take the lead in next-generation Silicon Photonics on 300mm wafers

- *24 leading technology companies and universities from 11 EU countries are joining efforts, driven by STMicroelectronics, to establish Europe as a technology leader in 300mm silicon photonics (SiPho) technology*
- *First silicon photonics applications-based innovations expected for datacenters and AI clusters, telecommunications, and automotive markets*

Geneva, Switzerland, September 23rd, 2025 – The STARLight project brings together a consortium of leading industrial and academic partners to position Europe as a technology leader in 300mm silicon photonics (SiPho) technology by establishing a high-volume manufacturing line, developing leading-edge optical modules, and fostering a complete value chain. From now until 2028, STARLight aims to develop application-driven solutions focusing on key industry sectors such as datacenters, AI clusters, telecommunications, and automotive markets.

Led by STMicroelectronics (NYSE: STM), a global semiconductor leader serving customers across the spectrum of electronics applications, the STARLight consortium has been selected by the European Commission under the EU CHIPS Joint Undertaking initiative.

"Silicon Photonics technology is critical to put Europe at the crossroads to the AI factory of the future and the STARLight project represents a significant step for the entire value chain in Europe, driving innovation and collaboration among leading technology companies. By focusing on application-based results, the project aims to deliver cutting-edge solutions for datacenters, AI clusters, telecommunications, and automotive markets. With well-recognized pan-European partners, the STARLight consortium is set to lead the next generation of silicon photonics technologies and applications," said **Remi El-Ouazzane, President, Microcontrollers, Digital ICs and RF products Group at STMicroelectronics.**

Silicon photonics is a preferred technology to support datacenters and AI clusters optical interconnects for scale-out and scale-up growth, as well as for other technologies such as LIDAR, space applications and AI photonic processors that require better energy-efficiency and power efficient data transfer. It combines the high-yield manufacturing capabilities of CMOS silicon, commonly used in electronic circuits, with the benefits of photonics, which transmits data using light.

Addressing key challenges

The development of advanced Photonic Integrated Circuits (PICs) will tackle several challenges:

- High-speed modulation: creating highly efficient modulators capable of operating at speeds exceeding 200 Gbps per lane is a key focus
- Laser integration: developing efficient and reliable on-chip lasers is critical for integrated systems
- New materials: various advanced materials will be explored with actors like SOITEC, CEA-LETI, imec, UNIVERSITE PARIS-SACLAY, III-V LAB, LUMIPHASE, and integrated on a single innovative silicon photonics platform, such as Silicon-on-Insulator (SOI), Lithium Niobate (LNOI), and Barium Titanate (BTO)

- Packaging and integration: optimizing the packaging and integration of PICs with electronic circuits is essential to optimize signal integrity and minimize power consumption.

Applications-based innovations

Datacenters / Datacom

The STARLight project has an initial focus to build datacom demonstrators for datacenters, based on PIC100 technology, capable of handling up to 200Gb/s with key actors including ST, SICOYA and THALES. It will also develop prototypes for free-space optical transmission systems, designed for both space and terrestrial communication.

Additionally, the project will leverage the multidisciplinary experience of major contributors to shape the research effort towards a 400Gbps per lane optical demonstrator using new materials, targeting the next generation of pluggable optics.

Artificial Intelligence (AI)

The STARLight project aims to develop a cutting-edge photonic processor optimized for tensor operations, such as matrix vector multiplication and multiply-accumulate, with superior characteristics in terms of size, data processing speed, and energy consumption compared to existing technologies. Since neural networks - the core algorithms behind AI - rely heavily on tensor operations, enhancing their efficiency is critical for AI processing performance.

Telecommunication

The STARLight project plans to develop and showcase innovative silicon photonic devices specifically designed for the telecommunications industry. Ericsson will focus on two concepts to improve mobile network efficiency. The first involves the development of an integrated switch to enable optical offload within Radio Access Networks, allowing for more efficient handling of data traffic. The second concept explores Radio over Fiber technology to relocate power-intensive processing ASICs away from antenna units, thus providing enhanced capacity and savings in embodied CO2. Additionally, MBRYONICS will develop a free space to fiber interface at the reception of Free Space Optical (FSO) communication, which is a key element in the design of an optical communication system.

Automotive/ Sensing

The STARLight project will also demonstrate how it performs in sensing applications, and the close relationships of STEERLIGHT, a LiDAR sensors maker, with leading car manufacturers will help make this an industrial reality.

Within the project, THALES will develop sensors that accurately generate, distribute, detect, and process signals with intricate waveforms to demonstrate key functionalities. More broadly, the outcomes of this project are also intended to benefit the wider ecosystem of indoor and outdoor autonomous robot manufacturers.

Note to editors: additional STARLight (300mm **S**ilicon **T**echnology for **A**pplications **R**elying on **Light** with Photonics Devices) partners quotes can be found below.

Link to the consortium https://www.starlight-project.eu/starlight/home/

The STARLight consortium members acknowledge the co-support from the European Union and their various respective national authorities.

STARLight partners quotes

CEA-Leti

"At CEA, we are thrilled to contribute to the STARLight project by accelerating the development of innovative photonic technologies and components. Our expertise in heterogeneous III-V on Silicon integration will help overcome current limitations and meet future application needs. We are enthusiastic about collaborating with key partners such as STMicroelectronics to quickly promote our innovations and address industry constraints, ensuring Europe's competitiveness in photonics." - **Sébastien Dauvé, CEO, CEA-Leti**

imec

"STARLight offers imec the opportunity to further explore alternative material options to scale its silicon photonics platform to higher transceivers data rates. Imec will leverage its expertise in advanced process development and photonics device research to identify the most suitable technology for the next generations of PIC for optical interconnects." - **Philippe Absil, Vice President R&D at imec**

NVIDIA

"With its contribution to STARLight consortium, NVIDIA continues to support the advancement of the optical European industry."

University Paris Saclay

"At University Paris Saclay, the centre for nanoscience and nanotechnology (C2N), a joint unit with also CNRS and University Paris Cité is more specifically involved to demonstrate advanced devices based on the use of new materials and new approaches compatible with STMicroelectronics PIC technology. The collaboration with the main EU players in silicon photonics is an opportunity to have accessed to state-of-the-art technology, to develop innovative devices addressing challenges for applications in silicon photonics and to interact with key industrial partners." - **Laurent Vivien, CNRS director at C2N**

Sicoya

"STARLight brings together Sicoya's long expertise in silicon photonics design and packaging with the transformative capabilities of ST's PIC technology which allows for superior RF performance by cointegrating advanced photonics and high-speed electronics. The STARLight consortium stands as a strong example of European collaboration, providing the technological foundation for sustainable value creation in a rapidly evolving global market. At a moment where photonics, and especially silicon photonics, is getting widely recognized as a key driving technology for datacenter and AI networks, as well as numerous other critical high-volume applications, Sicoya has now the opportunity to leverage ST's highly scalable and reliable platform for its future product lineup." - **Hanjo Rhee, CTO at Sicoya GmbH**

Soitec

“We are proud to take part in the STARLight initiative, a key milestone in strengthening Europe’s leadership in advanced photonics. At Soitec, we are deeply committed to driving innovation at the substrate level—enhancing SOI technology and advancing novel materials to meet the evolving demands of next-generation photonic applications. Through this collaboration, we aim to raise the bar in manufacturing quality, improve scalability, and reduce the environmental footprint of substrate production. Together with our partners, we are laying the technological groundwork for a more competitive and sustainable photonics ecosystem in Europe.” - **René Jonker, Executive Vice President, Edge and cloud AI division at SOITEC**

SteerLight

“STEERLIGHT is developing a new generation of 3D vision sensors—non-mechanical FMCW LiDARs—powered by groundbreaking silicon photonics technology that enables the entire system to be integrated onto a microchip. In the coming years, the light-vehicle components market will undergo a significant transformation driven by the rise of advanced driver-assistance systems (ADAS), which require compact, cost-effective, and high-performance LiDAR solutions. Securing sovereign sources of microelectronic components is a strategic priority for STEERLIGHT to enable large-scale production of this next generation of LiDAR systems. This is essential for European players to maintain a leading position in the global value chain and to ensure technological sovereignty in a highly competitive and rapidly evolving sector. The STARLight project will support this goal with ST's proprietary advanced silicon photonics platform, bringing the capability to industrial maturity.” - **François Simoens, CEO and co-founder of SteerLight.**

STMicroelectronics

“ST has the technology leadership and the collaborative mindset to support this EU initiative that pushes the boundaries of technology. ST’s new proprietary silicon photonics technology will bring to the consortium the ability to integrate multiple complex components into one single chip, while our unique integrated device manufacturer (IDM) model will enhance silicon photonics innovations within ST 300mm platform for high-volume manufacturing.” - **Remi El-Ouazzane, President, Microcontrollers, Digital ICs and RF products Group at STMicroelectronics.**

Thales

"Integrated photonics is set to bring major breakthroughs in the critical system architectures developed by THALES, for sensing, communications, and signal processing. A drastic reduction in size and power consumption offers numerous operational benefits, especially for remote systems. The STARLight project offers a unique opportunity to build upon the STMicroelectronics platform a sovereign EU supply chain for silicon photonics technology." - **Bertrand Demotes-Mainard, VP, CTO Hardware of THALES.**

Complete list of participants

AIXSCALE PHOTONICS; ALMAE TECHNOLOGIES; ANSYS; ARISTOTELIO PANEPISTIMIO AUTH EL Y THESSALONIKIS; COMMISSARIAT A L’ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES ; DESIGN AND REUSE; ERICSSON; HELIC ANSYS ELLAS MONOPROSOPH AE; III-V LAB; INTERUNIVERSITAIR MICRO-ELECTRONICA CENTRUM; KEYSIGHT TECHNOLOGIES; KNOWLEDGE DEVELOPMENT FOR POF SL; LUMIPHASE; MBRYONICS; NVIDIA; NCODIN; RHEINISCH-WESTFAELISCHE HOCHSCHULE AACHEN TECHNISCHE; SICOYA; SOITEC; STEERLIGHT; STMICROELECTRONICS; THALES; UNIVERSITA DEGLI STUDI DI PAVIA; UNIVERSITE PARIS-SACLAY