



Press Release

Integrated Photonics Consortium To Industrialize The European Silicon Photonics Value Chain, including Heterogeneous Integration of InP Chips by SMART Photonics

PhotonixFab to enable photonics product innovation and commercialization with a path to high volume manufacturing.

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The photonixFAB project aims to empower photonics innovation by SMEs and large entities by providing low entry access to both ultra-low loss silicon nitride (SiN) and silicon (Si) based photonics platforms with indium phosphide (InP) heterogeneous integration capabilities developed by SMART Photonics. This is a strategic initiative aiming to enable the European semiconductor and photonics industries to gain greater sovereignty. The project will strengthen the continent's manufacturing capabilities in key emerging areas.

The photonixFAB consortium is made up of major public and private enterprises, plus highly respected research institutes – all focusing on the development and production of next generation integrated photonics. Further to SMART Photonics, the high-profile partners include technology and manufacturing services providers LIGENTEC, X-FAB, PHIX Photonics Assembly and Luceda Photonics plus application developers Nokia, Nvidia, Aryballe, Brolis Sensor Technology and PhotonFirst, as well as the major research organizations CEA-leti and IMEC.

Their objective is to establish a European photonics device value chain and initial industrial manufacturing capabilities. Thus, providing a path to scalable high-volume manufacturing for innovative product developers.



A comprehensive set of photonics foundry and assembly capabilities will be covered by photonixFAB. These will include:

- Industry-scale integrated photonics manufacturing services with low entry barrier access and fast turn-around cycles for both low-loss SiN and Si based PICs.
- Enablement of microtransfer print technology for InP, LNOI and germanium based active and passive component heterogeneous integration on SiN and Si based PIC platforms.
- Development of scalable packaging and testing solutions in alignment with the (heterogeneous) PIC platform developments.
- Process design kit based design automation enablement for the photonic platforms.

As a part of the project, six demonstrators are being built to validate the implemented photonics value chains. These include applications such as datacom and optical switches, coherent optical transceiver, IR spectrometer for sensing, digital olfaction sensor for consumer healthcare and a health monitoring demonstrator.

A multitude of prospective opportunities for the cutting-edge photonic devices fabricated via the photonixFAB project have already been identified. Among them are data communication, telecoms, biomedical sensors/detectors, quantum computing and vehicle LiDAR.

“As the photonics industry is growing rapidly, the need for collaboration and alignment across the European photonics value chain is crucial”, states Johan Feenstra, CEO of SMART Photonics. “PhotonixFab will allow us to work within a highly valued consortium to ensure that InP active and passive elements can be combined with the Si and SiN platforms, to provide the right solutions to end customers.”



“Seeing huge potential emerging there, traditional semiconductor vendors, OEMs and start-ups are all now exploring photonic-enabled applications,” states Rudi De Winter, CEO of project lead X-FAB. “Consequently, this is the right time for companies to work together on building an extensive Europe-centric silicon photonics ecosystem that will help drive the continent’s competitiveness in this exciting new market.”

The project is being supported by the Key Digital Technologies Joint Undertaking (KDT JU), with funding from EU and the national authorities. The combination of this funding and the investments being directly made by each of the consortium members comes to a total of Euro 47.6 million. A major part of the work of this 3.5 year project will be conducted at X-FAB’s foundry operation in Corbeil-Essonnes, France, with additional activities also undertaken at the numerous other partners’ sites across Europe.

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Acronyms

InP – Indium Phosphide

IR – Infrared

LiDAR – Light Detection and Ranging

LNOI – Lithium Niobate-on-Insulator

PIC – Photonic Integrated Circuit

SiN – Silicon Nitride

SOI – Silicon-on-Insulator

About SMART Photonics

SMART Photonics plays a central role in the Photonics industry which has been recognized by the EU as one of Europe’s key enabling technologies having the potential to provide solutions to some of the most pressing societal and environmental challenges of our time. SMART Photonics is a leading independent foundry of photonic integrated chips (PIC’s) offering solutions for data and telecommunication, as well as for sensing – such as LiDAR –



and medical applications. We help our customers to bring their innovations to life. From proof of concept to full production. Adding value at every step of the way.

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