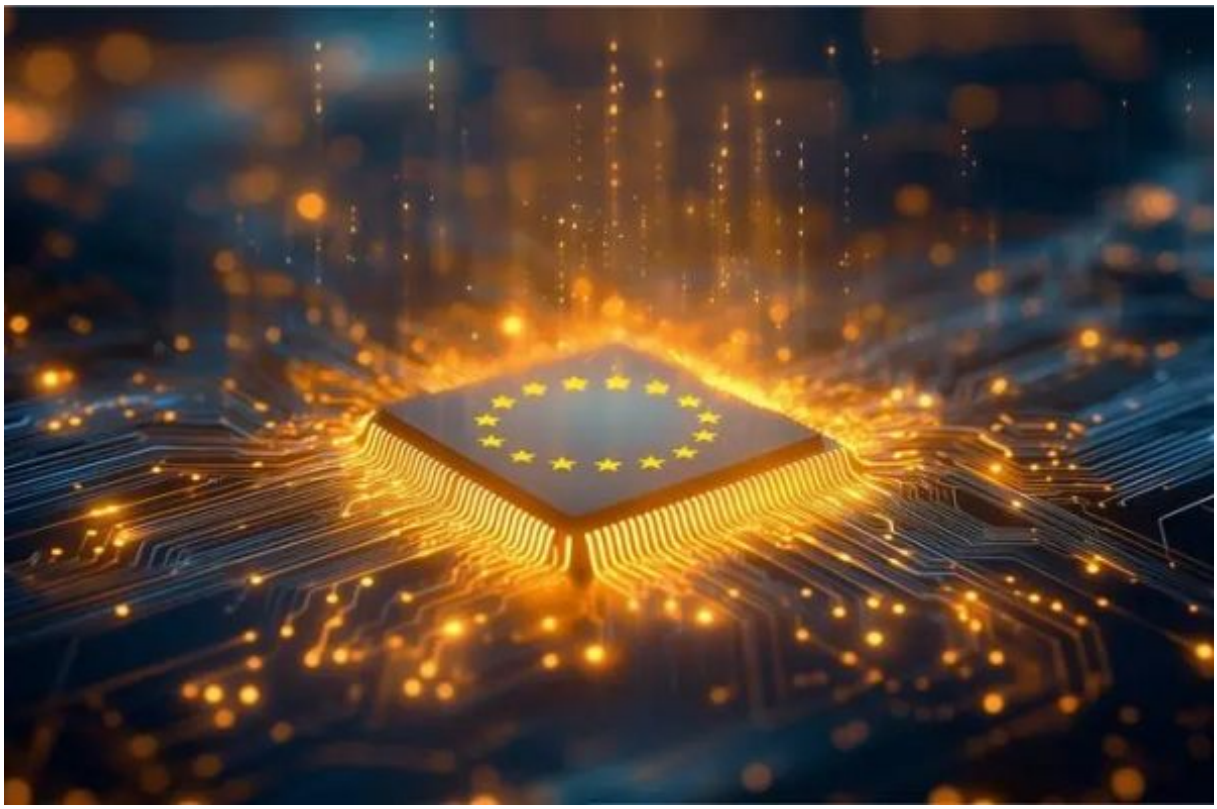

The European Commission and Chips JU select the PIXEurope consortium to lead the European Pilot Line on Advanced Photonic Integrated Circuits

The European Commission's Chips Programme confirms the selection of "PIXEurope", the European pilot line of photonic chips, and enters into the financial and technical negotiation phase.
Coordinated at the continental level by ICFO from Barcelona, ?? and with the support of the Ministry for Digital Transformation and of Civil Service of the Government of Spain, and the Generalitat of Catalonia, PIXEurope will mobilize investments of about 400 million euros to offer unique technological capabilities to industry, with the aim of enhancing its capacity regarding photonic chips and positioning Europe as a global leader.

PIXEurope includes partners from Austria, Belgium, Finland, France, Ireland, Italy, Poland, Portugal, Spain, the Netherlands and the United Kingdom.
At the Spanish level, PIXEurope draws on the direct participation of entities from the Autonomous Communities of Catalonia, Valencia, Madrid and Galicia, and will benefit the entire national community in the sector.

November 24, 2024

Every year, the needs of the digital society increases significantly, evidenced by the global market for photonic integrated circuits (PICs) production, which is expected to grow by more than **400%** in the **next 10 years**. By the end of the decade, the global photonics market is expected to exceed $**1,5 trillion**, a figure comparable to the entire **annual gross domestic** product of Spain, and of which photonic chips currently represent only a small percentage.?

This remarkable growth is due to the prevailing need and demand for devices for application in areas such as telecommunications, artificial intelligence, image sensing, automotive an mobility, medicine and healthcare, environmental care, renewable energy, defense an security, and a wide range of consumer applications sectors. The necessary features an specifications for such applications are provided by the combination of microelectroni chips and photonic chips. The former are responsible for information processing b manipulating electrons within circuits based on silicon and its variants, while the latter use photons in the visible and infrared spectrum ranges in a wide variety of materials

Within the framework of the European Chips Strategy, the so-called **European Chips Act**, the European Commission has announced the creation of **PIXEurope**, a new European pilot line for photonic chips that aims to offer cutting-edge technological platforms, transforming and transferring innovative and disruptive integrated photonics processes and technologies to accelerate their industrial adoption. The objective is the creation of European-owned/made technology in a sector of capital importance for technological sovereignty, and therefore for the creation and maintenance of the corresponding jobs in the Union.

The European Commission has selected this programme as its **5th pilot line** and has chosen the proposal led by ICFO, the Institute of Photonic Sciences (based in Barcelona), to coordinate it at continental level. The pilot line consortium also involves participating entities from **Austria, Belgium, Finland, France, Ireland, Italy, Poland, Portugal, the Netherlands and the United Kingdom**. The pilot line is co-financed by the Ministry for Digital Transformation and the Civil Service of the Government of Spain and supported by the Generalitat of Catalonia.

Within Spain, entities from the autonomous communities of Catalonia, Valencia, Madrid and Galicia are directly participating, and the entire national community in the sector will benefit. These institutions are:

Institut de Ciencies Fotoniques (ICFO) - Coordinator
Universitat Politecnica de Valencia (UPV)
Microelectronica Barcelona, IMB-CNM (CSIC)
Universidad Carlos III Madrid (UC3M)
Universidade de Vigo (UVigo)

Over the next 10 years and during the operational phase, the pilot line will boost the production capacity and innovation potential of European companies to a new level, allowing them to develop and manufacture prototypes of their products based on photonic chips. It will support research organizations in bridging the gap between the laboratory and the factory exploiting novel scientific results and accelerating the commercialization of this research, in particular by supporting the creation of new start-ups.
In particular, the pilot line will contribute to the design and development of an optimized manufacturing chain, involving end-users and industry partners for the evaluation of production processes to be transferred to industrial scale, with the ultimate aim of creating a unique European PICs ecosystem, with **open access services** to the user, establishing itself as the **first fully integrated open access PICs pilot line in the world**.
Valerio Pruneri, ICREA Professor, ICFO Group Leader and Director of the pilot line, highlights that i¿½PIXEurope is the first Photonic Chip Pilot Line in Europe that unifies diverse material , processes, and integration techniques that will allow the development and demonstration f devices and systems for all applications where Photonics is a key technology.i ?½ In addition, **Peter O'Brien, Head of Packaging at the Tyndall Institute** in **Ireland,** has mentioned that he is i¿½delighted to collaborate in PIXEurope, bringing Tyndall's expertise n advanced packaging to help the Pilot Line build the full technology supply chain. Euro e needs to scale-up its integrated photonic capabilities and the PIXEurope consortium is set o address this grand challengei?
½. Finally, **Kevin Williams, Chair of the Photonic Integration group at the Technical University of Eindhoven** in **the Netherlands** is particularly pleased that "PIXEurope will facilitate the wide adoption of advanced photonic integrated circuits produced using the standardised design kits and foundry processes pioneered in Europe. Advanced photonic chips will offer game changing advances in speed, power-efficiency and precision."

About Chips JU
The European Commission's Chips Joint Undertaking supports research, development, innovation, and future manufacturing capacities in the European semiconductor ecosystem.

It was launched by the European Union Council Regulation No 2021/1085 and amended in September 2023 as part of the Chips for Europe Initiative. It confronts semiconductor shortages and strengthens Europe's digital autonomy, engaging a significant EU, national/regional and private industry funding of nearly ?11 billion. The Chips JU is funded by the European Union, Chips JU Participating States and Private Members.
In April of 2024, the Chips JU announced the selection of four pilot lines to be implemented in Europe. Now, the PIC Pilot Line becomes the fifth to enter negotiations, in a key effort to strengthen capacity building and innovation in Europe. Aligned with the objectives of the Chips for Europe Initiative, this Pilot Line is expected to closely collaborate with the other Chips JU Pilot Lines (1, 2, 3 & 4), Design Platform and Competence Centres.

About ICFO

ICFO is a CERCA research centre member of the **Barcelona Institute of Science and Technology (BIST)**, founded in 2002 by the **Generalitat of Catalonia** and the **Universitat Politecnica de Catalunya · Barcelona Tech**, both of which are members of ICFO's board of trustees along with the **Cellex and Mir-Puig Foundations**, philanthropic entities that have played a critical role in the advancement of the institute. Located in the Mediterranean Technology Park in the metropolitan area of Barcelona, the institute currently hosts 500 people, organized in 26 research teams that use 80 state-of-the-art research laboratories. Research lines encompass diverse areas in which photonics plays a decisive role, with an emphasis on basic and applied themes relevant to medicine and biology, advanced imaging techniques, information technologies, a range of environmental sensors, tunable and ultra-fast lasers, quantum science and technologies, photovoltaics and the properties and applications of nano and quantum materials such as graphene, among others. In addition to three consecutive accreditations of the **Severo Ochoa national program** for top research excellence, ICFOnians have been awarded 16 elite **ICREA Professorships** as well as 50 European Research Council grants. ICFO is highly proactive in fostering entrepreneurial activities, spin-off creation, and creating collaborations and links between industry and ICFO researchers. To date, it has helped create 11 spin-off companies.